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March 15, 2013

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 – Sylvan Residential Complex
University of Massachusetts
Amherst, Massachusetts

Dear Ms. Tisa:

On behalf of the University of Massachusetts (UMass), this letter and attached reports and plan have been prepared to document the current status and proposed plans for the polychlorinated biphenyl (PCB) remediation activities being 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. These buildings are referred to as the Brown, McNamara, and Cashin Residences (see Figure 1-1). As previously communicated, UMass is undertaking a three year building envelope repair at each of the three buildings and Americans with Disabilities Act (ADA) restroom upgrades at the Brown and McNamara Residences. Given student schedules, the implementation of the work activities must be completed during the Summer break session (May through August) when students are not present in the buildings. To date, remediation plans and activities have been submitted and completed at the Brown Residence (2011) and McNamara Residence (2012) with the Cashin Residence activities scheduled for 2013.

Although plan submittals, status updates, and other communications have occurred throughout the 2011 and 2012 activities, formal written Approval from the Agency has not been received to date. As previously discussed, the intent of this submittal is to "link" the activities being conducted at the three buildings into one "Approval" for the Sylvan Residential Complex to cover the building envelope work, any impacted adjacent soils, and long term monitoring and maintenance activities. As such, the attachments to this letter include status update reports for the Brown and McNamara Residence and a Remediation Plan for the Cashin Residence.

A project timeline and list of significant project milestones / submittals associated with the Sylvan Residential Complex is as follows:

- Brown Residence:
  - 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; and
- PCB Remediation Project Status Report (building envelope repair and ADA restroom projects) – included as Attachment 1 of this letter.

- 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 – May 2012 through August 2012 (final verification wipe samples collected November 2012); and
  - PCB Remediation Status Report – included as Attachment 2 of this letter.
- Cashin Residence:
  - Inspection and Inventory of suspected PCB-containing sealants – August 2012; and
  - PCB Remediation Plan – included as Attachment 3 of this letter.

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 once the building repair projects have been completed at the buildings. 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 without impeding the building repair project. A plan for remediation activities will be submitted, as needed, following the assessment of ground surfaces. Similarly, the development and implementation of a long term maintenance and monitoring plan for all three of the buildings will be completed for the entire Sylvan Residential Complex once the scheduled activities are completed on all three of the buildings.

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
Tom Shaw, University of Massachusetts
Terri Wolejko, University of Massachusetts

Enclosures: Figure 1-1 – Site Location Map
Attachment 1 – PCB Remediation Project Status Report – Brown Residence
Attachment 2 – McNamara Residence PCB Remediation Status Report
Attachment 3 – Cashin Residence PCB Remediation Plan

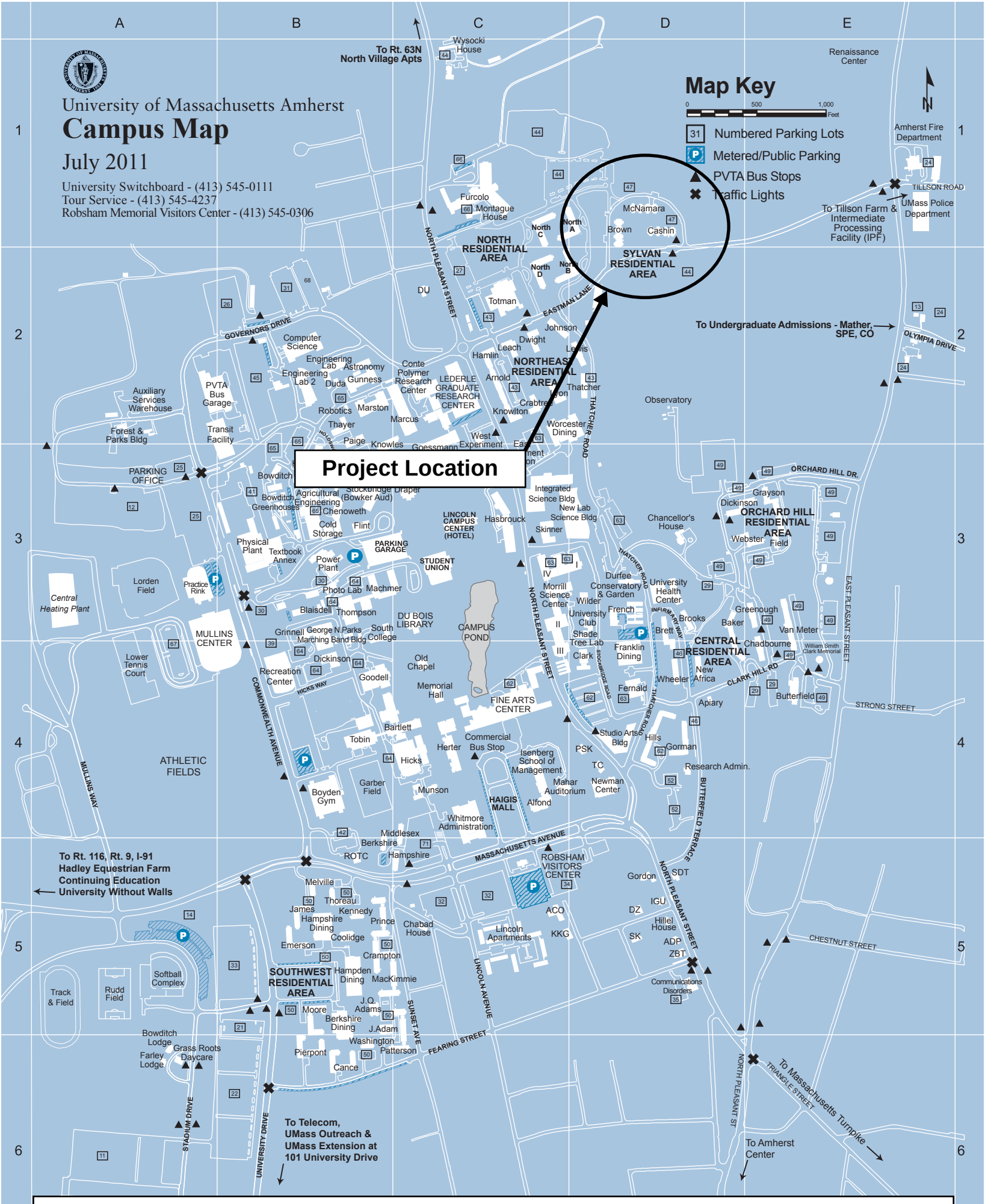


Figure 1-1 Site Location Map

ATTACHMENT 1: PCB REMEDIATION PROJECT STATUS UPDATE – BROWN RESIDENCE

PCB Remediation Project Status Update – Brown Residence
University of Massachusetts Amherst, Massachusetts

On behalf of the University of Massachusetts (UMass), this status report has been prepared to document the status of the Polychlorinated Biphenyl (PCB) remediation activities conducted to date at the Brown Residence located within the Sylvan Residential Complex at 112 Eastman Lane on the UMass Amherst campus in Amherst, Massachusetts.

This status report summarizes the PCB remediation activities conducted for the building envelope repair project and the Americans with Disabilities Act (ADA) restroom upgrade project. PCB remediation activities associated with each of these projects were substantially completed between May and August 2011. Previous communications regarding the ADA restroom upgrade project were made to your office on behalf of UMass by Environmental Compliance Services (ECS); however, as previously communicated, UMass is requesting that these two projects be "linked" into an overall Approval for PCB remediation activities at the three Sylvan Residence complex buildings. This status report is being submitted to provide additional information in support of this Approval.

A summary of the status for each of the two projects is presented in the sections below.

Building Envelope Repair Project

As presented in the November 2011 Addendum to the PCB Remediation Plan and the PCB Remediation Status Report submitted on February 10, 2012, activities associated with the building envelope repair project were substantially complete in August 2011. The exception to this was the application of the liquid coating to building materials in low-occupancy areas (i.e., areas greater than 8'8" above ground surface [ags]). As described in those two documents and for consistency with the McNamara and Cashin Buildings, a clear coat will be applied to brick materials adjacent to vertical joints in low-occupancy areas (i.e., one full brick width from the joint) and that no additional encapsulation be applied to areas adjacent to the horizontal joints within low-occupancy areas based on the overall data set, which indicated that PCBs were not present in materials adjacent to these joints at concentrations greater than the low-occupancy clean up criteria.

As proposed in the February 2012 Status Report, the application of the clear coat along vertical joints in low-occupancy areas will be conducted during the Summer of 2013 while the building envelope repairs are being conducted at the Cashin Residence. Following application of the clear coat and an appropriate cure time, verification wipe samples will be collected as described in the PCB Remediation Plan.

ADA Restroom Upgrade Project

As part of the ADA restroom upgrades to the first floor restrooms, caulking along vertical and horizontal caulked 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 parts per million (ppm).

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.

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

Building Materials Removed

Within the restrooms, approximately 48 linear feet (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).

Based on these results and given that surrounding brick wall materials were designated for removal during the renovation project, characterization samples of the brick and mortar adjacent to the caulked joints were collected to determine the extent of PCBs > 1 ppm for waste segregation purposes. Characterization samples of brick were collected at distances of one, two, and three inches from the caulked joints within both restrooms and in the hallway area for a total of nine brick samples. Analytical results indicated that PCBs were non-detect in eight of the nine samples with PCBs reported at a concentration of 0.321 ppm in the sample of brick collected two inches from the joint within Room 110 (the men's restroom). Characterization samples of mortar were also collected from the wall in Room 110 and results indicated that PCBs were present at concentrations of 425 ppm (1" from the joint), 5.97 ppm (2" from the joint), and 1.93 ppm (3" from the joint). Samples of brick and mortar were collected using a rotary impact hammer drill with a 1-inch drill bit to a depth of 0.5 inches from the surface of the materials. A summary of the analytical results was presented on Table 2.0 of the May 6, 2011 PCB Remediation Plan. The project work area and sample locations are presented on Figure 1.

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 1. The verification sample locations are presented on Figure 1. Analytical laboratory reports will be provided in the final completion report for the Sylvan Residential Complex.

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.

Building Materials Remaining In-Place

Following removal of caulking and caulking residue from the structural concrete and brick materials and prior to removal of the brick materials, the brick and concrete surfaces were wiped with hexane soaked rags and allowed to air dry. Wipe samples of the masonry surfaces formerly in direct contact with the caulking were then collected to determine the concentrations of PCBs available for direct contact at the surface of the masonry substrate prior to application of the encapsulating coatings. Analytical results from the six wipe samples collected indicated that PCBs were present at concentrations ranging from 94.2 to 779 µg/100cm^2 (brick materials formerly in direct contact with the caulked joints were removed for off-site disposal as described above following collection of the wipe samples).

As part of the in-place management approach, concrete materials formerly in direct contact with and to a distance of six inches from the vertical and horizontal caulked joints in Rooms 110 and 113 and in the hallway areas (including the concrete ceiling) were encapsulated with a combination of liquid coatings and other physical barriers. 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. Structural concrete surfaces and the concrete ceilings 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 of the caulking 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.

Long Term Maintenance and Monitoring

The development of a long term maintenance and monitoring plan for the in-place management of PCB-impacted building materials, including figures depicting the areas, will be completed and submitted for the entire Sylvan Residential Area once the scheduled activities are completed on all three buildings.

Waste Disposal

All PCB waste materials were transported off-site as a single ≥ 50 ppm PCB waste stream for disposal at Environmental Quality's Wayne Disposal Facility in Belleville, Michigan. Waste disposal documents will be provided in the final PCB Remediation Completion Report for the Sylvan Residential Complex.

Table 1

Summary of Verification Sampling Results
Brown Residence - ADA Restroom Upgrade
UMass Amherst

Building Materials	Location	Distance from Joint (inches)	Sample Date	Sample ID	Total PCBs (ppm)
Vertical Brick Wall to Concrete Column Joints					
Brick	Room 113	0	6/20/2011	PCB-Bulk-02	13.37
	Room 110	0	6/20/2011	PCB-Bulk-04	17.29
	Room 113	8	6/27/2011	PCB-Bulk-12	< 0.077
	Room 110	8	6/27/2011	PCB-Bulk-14	0.2
Mortar	Room 113	0	6/20/2011	PCB-Bulk-03	85.70
	Rom 110	0	6/20/2011	PCB-Bulk-05	661.00
	Room 113	8	6/27/2011	PCB-Bulk-11	0.474
	Room 110	8	6/27/2011	PCB-Bulk-13	**3.739**
Horizontal Brick Wall to Concrete Ceiling Joints					
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	**31.740**
	Vending Area	3	6/20/2011	PCB-Bulk-06	**44.495**
	Outside Kitchen	6	6/27/2011	PCB-Bulk-07	0.353
	Vending Area	6	6/27/2011	PCB-Bulk-09	**1.975**

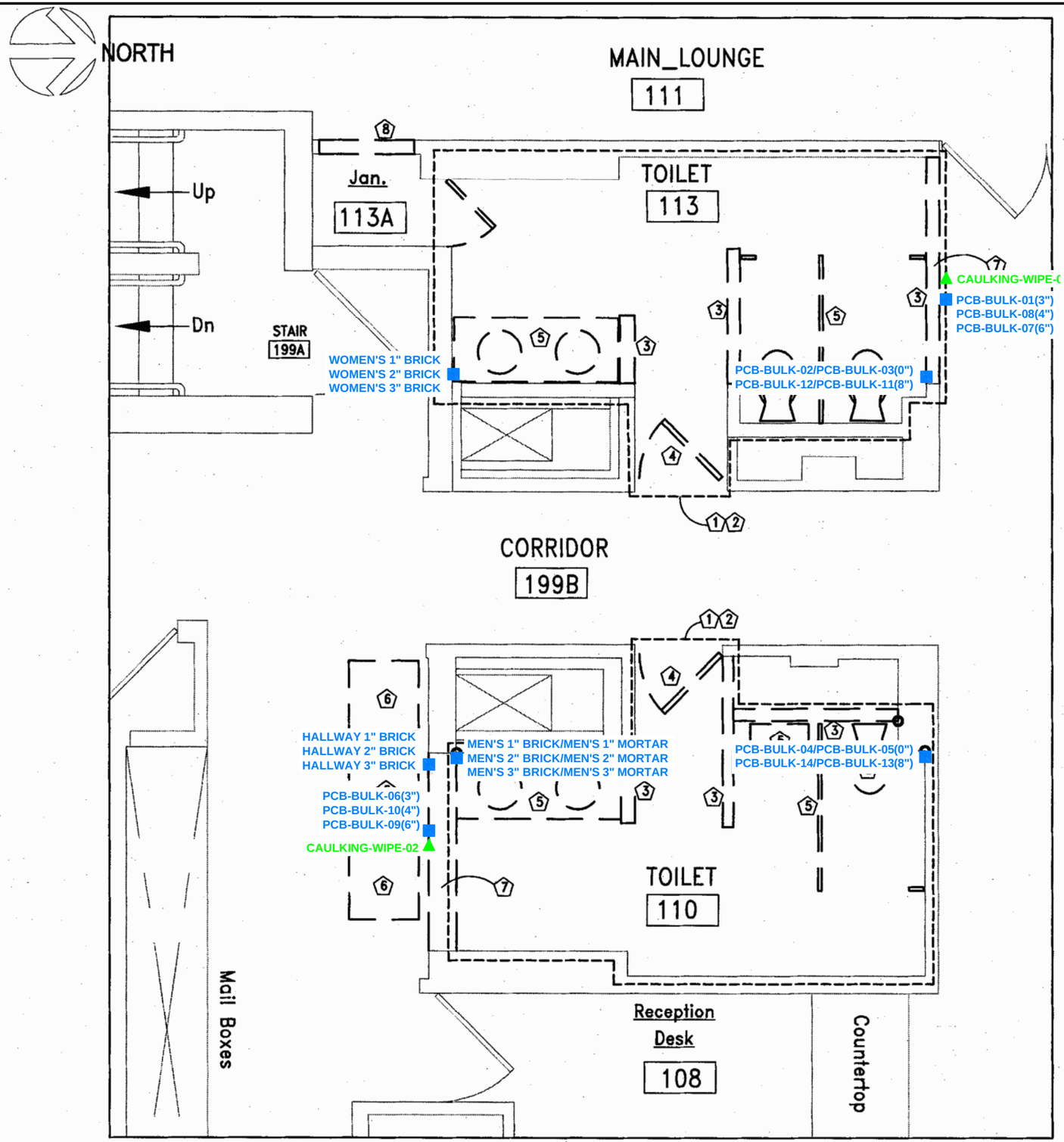
Notes:
1. Samples submitted to Spectrum Analytical Inc. for Soxhlet extraction (method 3540C) and analyzed for PCBs by EPA method 8082.
2. Total PCBs reported as Aroclor 1254 and Aroclor 1260. No other Aroclor reported at concentrations above the minimum laboratory reporting limits.

Table 2

Summary of Verification Wipe Sampling Results
Brown Residence - ADA Restroom Upgrade
UMass Amherst

Building Materials	Location	Distance from Joint (inches)	Sample Date	Sample ID	Total PCBs ($\mu g/100cm^2$)
Post-Removal Verification Wipes					
Brick/Concrete	Hallway	0	6/20/2011	PCB-wipe-01	**779**
	Room 113	0	6/20/2011	PCB-wipe-02	**236.4**
	Room 113	0	6/20/2011	PCB-wipe-03	**245.2**
	Room 110	0	6/20/2011	PCB-wipe-04	**94.2**
	Room 110	0	6/20/2011	PCB-wipe-05	**379**
	Hallway	0	6/20/2011	PCB-wipe-06	**702**
Post-Encapsulation Verification Wipes					
Caulking	Hallway	0	7/7/2011	Caulking-Wipe-01	**0.7**
	Hallway	0	7/7/2011	Caulking-Wipe-02	< 0.20

Notes:
1. Verification wipe samples collected with a hexane saturated gauze 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 and Aroclor 1260. No other Aroclor reported at concentrations above the minimum laboratory reporting limits.



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..

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SAMPLE LOCATIONS ADA UPGRADE AREA

DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
FIGURE 1.DWG

UMASS BROWN RESIDENCE
AMHERST, MASSACHUSETTS

BROWN RESIDENCE
PROJECT STATUS REPORT

JOB NO: 224166
DATE: MARCH 2013
SCALE: N.T.S.

FIGURE 1

ATTACHMENT 2: MCNAMARA RESIDENCE PCB REMEDIATION STATUS REPORT

PCB Remediation Status Report

McNamara Residence

University of Massachusetts

Amherst, Massachusetts

Project No. 224867

University of Massachusetts

March 2013

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Figure 1-1: Site Location Map

Figure 2-1: Summary of Brick Sampling Results – Horizontal and Vertical Control Joints

APPENDICES

Appendix A: Dust Monitoring Results

Appendix B: Verification Sample Locations

Appendix C: Analytical Laboratory Reports and Data Validation Summaries

Appendix D: Waste Disposal Documents

1. INTRODUCTION

This Polychlorinated Biphenyl (PCB) Remediation Status Report has been prepared by Woodard & Curran to document PCB remediation activities completed in 2012 within the Sylvan Residential Complex located at 112 Eastman Lane on the University of Massachusetts (UMass) campus in Amherst, Massachusetts (Figure 1-1).

PCB remediation activities completed in 2012 included those activities associated with the McNamara Residence building envelope repair project and Americans with Disabilities Act (ADA) restroom upgrade project as described in the PCB Remediation Plan submitted to the U.S. Environmental Protection Agency (EPA) on March 21, 2012. To date, written Approval from the EPA has not been received for this plan.

As indicated on 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) and the ADA restroom upgrade projects at the Brown and McNamara Residences into a single project for reporting and approval purposes. This Status Report is being submitted to provide additional information in support of this Approval.

1.1 SITE DESCRIPTION

The McNamara Residence 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 (north and west sides) or sloped toward the building (south and east sides). Adjacent ground surfaces are mostly grass with some asphalt pavement, or landscaped areas.

1.2 SITE BACKGROUND / CONCEPTUAL SITE MODEL

The McNamara Residential dormitory was constructed during a time period when PCBs were sometimes used in certain building materials (i.e. caulking). In preparation for a building envelope repair project, a materials survey was conducted of various hazardous materials that may have been 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). 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 project and ADA restroom upgrade project as presented in the PCB Remediation Plan submitted in March 2012.

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 remediation activities. It should be noted that characterization sampling was conducted throughout the program in support of these submittals.

- Initial Site Inspection and Caulking Sample Collection – August 18, 2011;
- PCB Remediation Plan submitted to EPA – March 21, 2012;
- Remediation work completed – May through August 2012; and
- Final verification wipe samples collected – November 23, 2012.

1.4 PROJECT TEAM

The remediation project team consists of the following parties:

- University of Massachusetts Amherst - Owner
- Marois Construction Inc. – General Contractor
- Compass Restoration – PCB Remediation Subcontractor (building envelope repair project)
- Accutech Insulation and Contracting, Inc. – PCB Remediation Subcontractor (ADA restroom upgrade project)
- Woodard & Curran – PCB Remediation Consultant
- Con-Test Analytical Laboratory – Laboratory for sample analysis

2. BUILDING ENVELOPE REPAIR REMEDY IMPLEMENTATION

This section describes the PCB cleanup and disposal activities conducted at the Site in accordance with the PCB Remediation Plan, subsequent communications with EPA, and the requirements of 40 CFR 761.61. Active remediation activities on the building (removals and encapsulations) began on May 15, 2012 and were concluded during the week of August 14, 2012. 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 through verification testing and removal of parapet wall building materials (bricks, caps, etc.) for off-site disposal as either ≥ 50 ppm PCB waste or general construction debris; and
- Encapsulation of building materials that were scheduled to remain in place and contained PCBs at concentrations above the high or low occupancy clean up levels for PCB remediation wastes, as applicable.

A summary of the remediation activities, including site preparations and controls, PCB – impacted material removal and 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.

For the building envelope repair project, polyethylene sheeting was placed on the ground surfaces adjacent to the building below the active removal areas. Water misting was the primary means of dust control throughout the remediation activities. Removal of the ≥ 50 ppm PCB containing caulking from vertical and horizontal control joints was conducted within polyethylene containment structures constructed on the lift boom (see photo to the right). HEPA filtration was also utilized for additional dust controls during the removal of the horizontal and vertical control joints on the boom lift (negative pressure controls were not established, the HEPA filtration was used to provide additional dust controls within the containment structure constructed on the lift booms). Work areas on the roof top for removal of building or penthouse parapet walls, Roof Top Unit (RTU) enclosure walls, and penthouse control joints were demarcated with caution tape and PCB work area signage at the perimeter of the work area. Polyethylene sheeting was placed on the scaffolding and/or roof top surfaces below each area.

Perimeter dust 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 C of the PCB Remediation Plan. A direct reading particulate meter (Thermo Electron PDR-1000AN Personal Hand Held Dust 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. Results of the dust monitoring are 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.

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.

A summary of the analytical results are presented on Tables 2-1 through 2-5 as described in the sections below. Locations of the samples are depicted on the figures provided in Appendix B. The complete analytical laboratory reports are provided in Appendix C.

2.3 PARAPET WALLS AND RTU ENCLOSURE WALLS

Caulking associated with the parapet wall cap joints, horizontal and vertical parapet wall control joints, and the RTU enclosure wall cap joints was identified as containing ≥ 50 ppm PCB-containing caulking. A summary of the removal and verification sampling program is provided below. Analytical results are summarized on Table 2-1.

2.3.1 Verification Sampling

Prior to removal of the caulked joints, verification samples of adjacent building materials were collected for waste segregation purposes as follows:

- Parapet Wall Cap Joints (1,025 l.f.) – Verification samples were collected from the top of the first row of horizontal bricks below the caulked joints (i.e., immediately below the vertically aligned soldier bricks below the cap joints). Analytical results indicated the following (results below include characterization samples previously reported in the PCB Remediation Plan):
    - Analytical results from 21 samples indicated that total PCBs were non-detect (15 samples at < 0.10 ppm) or ≤1 ppm (6 samples with PCBs ranging from 0.13 to 0.34 ppm); and
    - Analytical results from 2 samples indicated that PCBs were > 1 ppm with reported concentrations of 1.8 and 6.1 ppm. Based on these results, additional samples were collected from the second full row of brick below the caulked joint. Analytical results from these samples indicated that PCBs were present at concentrations of 0.69 and 0.8 ppm. The waste segregation cut line adjacent to these two samples was extended to include the first row of horizontal brick in either direction to the next clean sample point.

- Horizontal Parapet Wall Control Joints (800 l.f.) – Verification samples were collected from the second row of horizontal bricks above the caulked joint. Analytical results indicated that PCBs were either non-detect (7 samples at < 0.10 ppm) or < 1 ppm (10 samples with concentrations ranging from 0.12 to 0.86 ppm).
- Vertical Parapet Wall Control Joints (230 l.f.) – Verification samples were collected from the beginning of the second full row of brick (i.e., approximately 8 inches from the joint). Analytical results indicated that PCBs were either non-detect (2 samples at < 0.095 ppm) < 1 ppm (6 samples with PCBs ranging from 0.1 to 0.25 ppm).
- RTU Wall Enclosure Wall Cap Joints (50 l.f.) - A total of four samples (one per enclosure wall) were collected from the first row of brick directly below the wall cap joints. Analytical results indicated that PCBs were non-detect (one sample at < 0.095 ppm) or present at concentrations < 1 ppm (three samples with concentrations of 0.17, 0.30, and 0.45 ppm).

2.3.2 Caulking and Building Material Removal

Following the establishment of site controls and verification sampling as described above, caulking, bricks, and other building materials associated with the parapet walls and RTU enclosure walls were removed and segregated for off-site disposal. Caulking identified as containing ≥ 50 ppm PCBs was removed for disposal as PCB Bulk Product Waste. Building materials associated with the parapet walls and RTU enclosure walls were segregated for disposal as follows:

- Parapet walls – The following materials were removed for off-site disposal with the caulking as ≥ 50 ppm PCB wastes;
    - Aluminum cap and associated materials formerly in direct contact with the caulked joints;
    - The first course of brick materials below the caulked joints (i.e., vertically aligned soldier bricks). In addition, along two sections of the parapet wall, the first row of horizontal bricks were also removed for disposal as ≥ 50 ppm PCB wastes based on the results of verification sampling described above; and
    - The first course of brick materials above the horizontal parapet wall control joints and brick materials within eight inches of the vertical parapet wall control joints (i.e., one full row of brick).
- RTU Enclosure Walls – RTU enclosure wall cap materials were removed as a single waste stream for disposal as ≥ 50 ppm PCB waste.

Remaining parapet wall and RTU enclosure wall materials were removed and segregated for disposal as general construction and demolition debris based on the results of verification sampling, as described above.

2.4 HORIZONTAL AND VERTICAL CONTROL JOINTS

The horizontal and vertical control joints on the building façade and penthouse walls (including the two stairwell penthouse access doors) were identified as containing ≥ 50 ppm PCB-containing caulking. In accordance with the PCB Remediation Plan, caulking and backing materials were removed for off-site disposal as PCB Bulk Product waste and building materials adjacent to the caulked joints and containing PCBs above the applicable use criteria were encapsulated with a liquid coating. A summary of the removal activities, verification sampling program, and the encapsulation of building materials associated with these joints is provided below.

2.4.1 Verification Sampling

In accordance with the PCB remediation plan, samples were collected from brick materials adjacent to the 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 (ags) including 225 l.f. of horizontal control joints and 300 l.f. of vertical control joints; and
- Low Occupancy Criteria (≤ 25 ppm) – Locations > 8' 8" ags (including rooftop penthouses) including 4,915 l.f. of horizontal control joints and 1,530 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.

2.4.1.1 Horizontal Control Joints

Verification samples were collected from brick materials above and below the horizontal control joints in high and low occupancy areas. A summary of the analytical results is as follows:

- High Occupancy Areas (< 8' 8" ags – 225 l.f.) – Verification samples were collected at a frequency of one sample set per building elevation. Analytical results were as follows:
    - Above the Joint - Four samples were collected from the second row of brick materials above the joints. Analytical results indicated that PCBs were present below the high occupancy use criteria of ≤ 1 ppm with reported concentrations of 0.12, 0.13, 0.14, and 0.23 ppm;
    - Below the Joint – Four samples were collected from the fourth row of brick below the caulked joints. Analytical results indicated that PCBs were present at concentrations below the high occupancy use criteria of ≤ 1 ppm with reported concentrations of 0.096, 0.12, 0.73, and 0.75 ppm.
- Low Occupancy Areas (> 8' 8" ags – 4,915 l.f.) – Verification samples of brick were collected at a distance of 0.5 to 1.0 inches above or below the caulked joints at a frequency of 1 sample per 200 l.f. of caulked joint to evaluate PCB impacts to brick materials immediately outside the return of the joints. Samples were collected on an alternating basis from materials above and below the joints. A summary of the samples collected is as follows:
    - Above the Joint – 12 samples were collected from brick materials 0.5 to 1.0 inches above the caulked joint. Analytical results from ten of the samples indicated that PCBs were either non-detect (3 samples at < 0.10 pm) or below the low-occupancy use criteria of ≤ 25 ppm (7 samples with an average PCB concentration of 1.28 ppm). Analytical results from two samples indicated that PCBs were present at concentrations > 25 ppm with reported PCB concentrations of 160 and 280 ppm. While these concentrations are above the low occupancy cleanup criteria, an important consideration is that these samples were collected prior to removal of the caulking from these joints and are not considered representative of conditions following removal of the caulking.
    - Below the Joint – 13 samples were collected from brick materials 0.5 to 1.0 inches below the joint. Analytical results from all 13 samples indicated that PCBs were present at concentrations < 25 ppm with reported concentrations ranging from 0.47 to 17 ppm and an average concentration of 4.34 ppm.

2.4.1.2 Vertical Control Joints

Verification samples were collected from brick materials adjacent to vertical control joints at a frequency of one sample per 50 l.f. of caulked joint at locations within high occupancy areas and at an approximate frequency of one sample per 200 l.f. of caulked joint at locations within low occupancy areas at a distance of eight inches from the caulked joints (i.e., beginning of the second full row of brick). A summary of the analytical results is as follows:

- High Occupancy Areas (≤ 8' 8" ags – 300 l.f.) – Six verification samples were collected from brick materials within the high occupancy areas. Analytical results indicated that PCBs were < 1 ppm in five of the six samples with concentrations ranging from 0.076 to 0.38 ppm. PCBs were reported in one sample at a concentration of 3.1 ppm. Additional sampling was not conducted due to the overall project schedule which would not support multiple rounds of sampling. Overall, the average PCB concentration was approximately 0.65 ppm; and
- Low Occupancy Areas (> 8' 8" ags – 1,530 l.f.) – Eight verification samples were collected from brick materials within the low occupancy areas. Analytical results indicated that PCBs were either non-detect (5 samples at < 0.10 ppm) or present at concentrations below the low occupancy clean up criteria of 25 ppm (3 samples with reported concentrations of 0.25, 0.27, and 6.8 ppm).

2.4.2 Caulking Removal

Following the establishment of site controls as described above, caulking, backing materials, 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.

2.4.3 Encapsulation and Verification Sampling – Materials Formerly In Direct Contact

Following caulking removal, two coats of Sikagard 62 liquid epoxy coating were applied to brick materials within the return of the horizontal and vertical control joints (i.e., materials formerly in direct contact with the caulking). Verification wipe samples were collected from the encapsulated surfaces at a frequency of one sample per 200 l.f. of joint in high and low occupancy areas for a total of 44 verification wipe samples. The locations of the verification wipe samples are depicted in Appendix B. A summary of analytical results is presented on Table 2-3 and provided below.

2.4.3.1 Horizontal Control Joints

Following application of two coats of epoxy coating verification wipe samples were collected from joints within high and low occupancy areas. Analytical results were as follows:

- High Occupancy Areas (≤ 8' 8" ags) – Five verification wipe samples were collected following application of two coats of liquid epoxy coating from horizontal joints within high occupancy areas. Analytical results from four of the five samples indicated that PCBs were non-detect (1 sample at < 0.20 µg/100cm^2) or present at concentrations below the encapsulation target of 1 µg/100cm^2 (three samples with reported concentrations of 0.33, 0.35, and 0.38 µg/100cm^2). Analytical results from one sample collected on the north elevation indicated that PCBs were present at a concentration of 4.7 µg/100cm^2. Based on this result and the results of the visual inspections and verification wipes samples collected from vertical joints on the north elevation

(see discussion below), a third coat of Sikagard 62 liquid epoxy was applied to all horizontal control joints within high occupancy areas on the eastern half of the north elevation. Following application, a follow-up wipe sample was collected from an off-set location. Analytical results indicated that PCBs were non-detect (< 0.20 µg/100cm^2).

- Low Occupancy Areas (> 8' 8" ags) – 24 wipe samples were collected following the application of two coats of Sikagard 62 liquid epoxy from horizontal control joints within low occupancy areas. Analytical results indicated that PCBs were either non-detect (4 samples at < 0.20 µg/100cm^2) or below the encapsulation target of 1 µg/100cm^2 (15 samples with results ranging from 0.27 to 0.86 µg/100cm^2).

  Analytical results from five samples indicated that PCBs were present at concentrations > 1 µg/100cm^2 with reported concentrations ranging from 1.15 to 2.6 µg/100cm^2. Due to the overall project schedule, a third coat of liquid epoxy coating was not applied to all locations represented by these five samples. On portions of the north and east elevations, where the application was performed earliest in the project (as represented by two of the five samples), the schedule did support the application of a third coat of liquid epoxy. Following application, a follow-up wipe sample was collected from off-set locations. Analytical results indicated that PCBs were non-detect (< 0.20 µg/100cm^2) and present at a concentration of 0.52 µg/100cm^2. No additional coatings were applied in the other areas represented by the other three wipe samples containing > 1 µg/100cm^2 because of the planned application of caulking over the epoxy, the results only slightly above the encapsulation target, the location of these joints (> 8' 8" ags), and the overall project schedule.

2.4.3.2 Vertical Control Joints

Following application of two coats of epoxy coating, 15 verification wipe samples were collected from joints within high and low occupancy areas. Analytical results indicated the following:

- Analytical results from three samples indicated that PCBs were either non-detect (2 samples at < 0.20 µg/100cm^2) or below the encapsulation target of 1 µg/100cm^2 (total PCBs reported at a concentration of 0.36 µg/100cm^2); and

- Analytical results from 12 of the samples indicated that PCBs were greater than the encapsulation target of 1 µg/100cm^2 with total PCBs reported at concentrations ranging from 1.1 to 170 µg/100cm^2.

Due to the overall project schedule, the verification wipe samples were collected as the application of the epoxy coatings was completed in a given area. During the initial phases of application, primarily conducted on the north elevation, a third coat of epoxy was applied to materials represented by wipe samples with PCBs reported at concentrations > 1 µg/100cm^2. However, following application of the third coat, analytical results indicated that PCBs were still present at concentrations > 1 µg/100cm^2 in three of the four samples (analytical results from one follow-up wipe on the west elevation reported PCBs at a concentration of 0.78 µg/100cm^2). In addition, the overall PCB concentrations in the other three samples increased from 8.8 to 9 µg/100cm^2, from 1.3 to 5.2 µg/100cm^2, and from 20.6 to 250 µg/100cm^2.

Based on these results, additional inspections of the vertical joints were conducted and it was determined that in some locations residual materials were present on backing materials located behind the joint (i.e., beyond the planned extent of encapsulation). Based on discussions with the project team, it was determined that some of the backing materials deep within the joint return could not be removed without substantial damage to the façade of the building given the narrow width of the joints. Direct contact between these residual backing materials and the new

caulking to be installed is not anticipated due to the new foam backing rod materials to be installed prior to caulking installation.

Due to the overall project schedule and the planned application of backing materials prior to the final bead of caulking within the joints (i.e., application of an additional barrier), the project team decided to complete the installation of the replacement caulking on all vertical joints. 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.

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

Following removal of the caulking and 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 as described in the following sections. 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 Tables 2-4 and 2-5. A summary of the analytical results is provided below.

2.4.4.1 Horizontal Control Joints

Based on the results of verification sampling described in Section 2.4.1 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. Within low occupancy areas, brick materials surrounding horizontal control joints were not encapsulated based on the results from the verification samples and the > 8'8" ags location of these areas.

2.4.4.2 Vertical Control Joints

Based on the results of verification sampling described in Section 2.4.1 above, two coats of Sikagard 670W clear acrylic coating were applied to one full row of bricks (i.e., approximately eight inches) along vertical control joints in both high and low occupancy areas.

2.4.4.3 Verification Wipe Sampling

Due to the overall project schedule and remediation sequencing, the initial verification wipe samples were collected as the encapsulant was applied to a specific portion of the building, beginning with the eastern portion of the north elevation. Following application of the liquid coating on the north elevation, analytical results from verification wipe samples indicated that PCBs were present at concentrations above the encapsulation target of 1 µg/100cm^2 (total PCBs were reported in seven samples at concentrations ranging from 1.4 to 59 µg/100cm^2 with an average PCB concentration of 15.3 µg/100cm^2). Based on these results, and the results of a small scale pilot test conducted on a limited portion of the east elevation, the project team decided to apply a third coat of Sikagard 670W to the areas required to be encapsulated. Following application of the third coat to the north elevation building materials, five verification wipe samples were collected from brick materials adjacent to horizontal and vertical control joints. Analytical results indicated that PCBs were present at concentrations of 2.1, 3.0, 6.9, 8.9, and 20 µg/100cm^2 with an average PCB concentration of approximately 8.2 µg/100cm^2. A summary of the analytical results is presented on Table 2-4.

Based on these results, which indicated that a third coat may not have been effective in achieving the target encapsulation levels, the overall project schedule which would not support repeated rounds of application, and the compatibility of additional coats without failing, the project team decided to complete the application of two coats of Sikagard 670W as indicated in the PCB Remediation Plan on the remaining portions of the building (south, east, and

west elevations) and to collect the post-application verification wipe samples during the next scheduled student break, which was the November Thanksgiving break.

On November 23, 2012, verification wipe samples were collected at a frequency of one sample per 50 l.f. in high occupancy areas (horizontal and vertical control joints) and at a frequency of one sample per 200 l.f. in low occupancy areas (vertical control joints). A total of 20 samples were collected from brick materials adjacent to horizontal and vertical control joints in accordance with the standard wipe test methods of 40 CFR 761.123 and the PCB Remediation Plan. On the south, east, and west elevations, verification wipes were collected from locations selected to provide representative samples across the building. On the north elevation, the samples were collected from locations off-set from the previous samples.

A summary of the analytical results is as follows:

- Horizontal Control Joints – Analytical results indicated that PCBs were either non-detect (2 samples at < 0.20 µg/100cm^2) or present at concentrations below the target level of 1.0 µg/100cm^2 (total PCBs reported at concentrations ranging from 0.21 to 0.75 µg/100cm^2 in four samples); and
- Vertical Control Joints – Analytical results were as follows:
    - High Occupancy Areas – Total PCBs reported in the six samples collected from high occupancy areas ranged from 0.45 to 2.3 µg/100cm^2 with an average concentration of 1.4 µg/100cm^2; and
    - Low Occupancy Areas – Total PCBs reported in the eight samples collected from low occupancy areas ranged from 0.20 to 2.0 µg/100cm^2 with an average concentration of 1.2 µg/100cm^2.

All concentrations are within the range of concentrations that will be proposed for continued monitoring in the long term maintenance and monitoring program for the Sylvan Residential Complex. Based on these results, no addition remediation activities are proposed to be conducted for the encapsulation of residual PCBs in brick materials outside the return of the horizontal and vertical control joints at this time. A summary of these verification wipe sample results is presented on Table 2-5. 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.

3. ADA RESTROOM UPGRADES REMEDY IMPLEMENTATION

Caulking associated within horizontal and vertical masonry joints within the ADA Restroom upgrade project area was identified as containing ≥ 50 ppm PCB-containing caulking. A summary of the removal and verification sampling program is provided below.

3.1 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.

Prior to implementation of the ADA restroom upgrade remediation a polyethylene containment was constructed around the work area and HEPA filtration was used to establish negative pressure controls within the work area. Within the containment, water misting was used to control dust generation.

Perimeter dust monitoring was conducted during active removal activities in accordance with Appendix C of the PCB Remediation Plan. A direct reading particulate meter (Thermo Electron PDR-1000AN Personal Hand Held Dust 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.

3.2 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.

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.

A summary of the analytical results are presented on Table 3-1 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.

3.2.1 Verification Sampling

Prior to implementation of remediation activities, verification samples of the concrete ceiling were collected to determine the extent of PCBs > 1 ppm. A summary of the analytical results is presented on Table 3-1. A summary of the samples collected, including characterization samples previously reported in the PCB Remediation Plan is as follows:

- Brick – Samples of brick were collected at a distance of four inches from two vertical caulked joints (immediately past the first half row of brick) and at a distance of four inches below two horizontal control joints (the second row of brick below the joints). Analytical results from all four samples indicated that PCBs were present at concentrations < 1 ppm (total PCBs reported at concentrations of 0.172 and 0.185 ppm in samples collected away from the vertical joints and at concentrations of 0.383 and 0.490 ppm in samples collected below the horizontal joints).

- Concrete Columns - Samples of concrete were collected away from vertical control joints at two locations. At each location, samples were collected at distances of 0.5 to 1.0 inches and three inches from the joint. Analytical results indicated that PCBs were present at concentrations > 1 ppm in all four samples collected with reported concentrations of 28.8 and 611 ppm at a distance of 0.5 to 1.0 inches and 5.04 and 321 ppm at a distance of three inches from the caulked joints.

- Concrete Ceilings – Samples of concrete were collected at a distance of four inches away from the horizontal wall to ceiling joints at three locations. Analytical results indicated that PCBs were present at concentrations of 0.383, 0.490, and 2.81 ppm. Based on this result, a follow up sample was collected at the location reported to contain PCBs at a concentration of 2.81 ppm, at a distance of ten inches from the joint. Additionally, one sample was also collected from the other side of the work area at a distance of 12 inches from the caulked joint (hardware for suspending lighting was located ten inches from former joint at this location). Analytical results from these samples indicated that PCBs were present at concentrations of 8.4 and 10.9 ppm. Due to the overall project schedule, no additional sampling was conducted from the concrete ceiling.

3.2.2 Caulking and Building Material Removal

Following the establishment of site controls and verification sampling as described above, caulking, bricks, and other building materials associated with ADA restroom upgrade project were removed and segregated for off-site disposal on June 14 and 15, 2012. Caulking identified as containing ≥ 50 ppm PCBs was removed for disposal as PCB Bulk Product Waste. Brick materials within the restrooms and in the surrounding hallways were segregated for disposal based on the results of the characterization sampling reported in the PCB Remediation Plan as follows:

- Brick walls scheduled for removal (within the restrooms):
    - The first row of brick below horizontal caulked joints (materials in direct contact with and to a distance of approximately four inches from the joint) and the first half-row of brick away from vertical caulked joints (materials in direct contact with and to a distance of approximately four inches from the joint) were removed for off-site disposal as ≥ 50 ppm PCB waste; and
    - Remaining brick materials were removed for disposal as general demolition debris based on the results of characterization sampling as presented in the PCB Remediation Plan.
- Brick walls scheduled to remain in place (within the surrounding hallways):
    - The first row of brick below horizontal caulked joints (materials in direct contact with and to a distance of approximately four inches from the joint) and the first half-row of brick away from vertical caulked joints (materials in direct contact with and to a distance of approximately four inches from the joint) were removed for off-site disposal as ≥ 50 ppm PCB waste; and
    - Remaining brick materials were left in place without further actions based on results of characterization sampling as presented in the PCB Remediation Plan.

3.2.3 Encapsulation and Verification Sampling

Following caulking removal, a multi-component barrier system was applied to concrete materials formerly in direct contact with the caulked joints and to materials away from the joints, as follows:

- Concrete Ceiling – Concrete materials to distance of 12 inches from the caulked joints were encapsulated with two coats of Sikagard 62 liquid epoxy coating. All concrete ceiling materials to the first 90-degree angle were then encapsulated with a final coat of interior acrylic latex paint; and

- Concrete Columns – Concrete materials were encapsulated with two coats of Sikagard 62 liquid epoxy coating to the first 90-degree angle from the former caulked joint. Materials beyond this point are located behind masonry walls and not available for direct contact. Concrete columns in the hallway area were then covered with a final coat of interior acrylic latex paint and concrete columns in the restrooms were covered with dry wall materials.

Following application of the liquid epoxy coatings described above, verification wipe samples were collected from the encapsulated surfaces along vertical joints and horizontal ceiling joints. A summary of the analytical results is as follows:

- Concrete Columns – Four wipe samples were collected from epoxy coated surfaces along the concrete columns in the restrooms and in the hallway areas. Analytical results from the wipe samples collected within the restrooms indicated that PCBs were present at concentrations of 1.3 and 1.5 µg/100cm^2. Analytical results from the two wipe samples collected in the hallway areas indicated that PCBs were non-detect (< 0.20 µg/100cm^2) and present at a concentration of 0.5 µg/100cm^2. As part of the upgrade project, concrete materials within the restrooms were enclosed under dry wall materials and concrete materials within the hallway areas were coated with a final layer of interior acrylic latex paint; and

- Concrete Ceiling – Three samples were collected from the epoxy coated surfaces of the concrete ceiling. Total PCBs were reported as non-detect (1 sample at < 0.20 µg/100cm^2) and at concentrations of 0.31 and 1.6 µg/100cm^2. Following application of the final acrylic coating to the concrete ceilings, two wipe samples were collected and results indicated that PCBs were non-detect (< 0.20 µg/100cm^2) and present at a concentration of 0.43 µg/100cm^2.

Based on these results and the surface finishes (e.g., drywall or latex paint), no additional remediation activities are proposed to be conducted in this area. 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 3-1. 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; and 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:

- 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.
- 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. Although some samples were not received within the allowable temperature range, these samples were either wipe samples or received directly from sampling and no qualifications were applied. All samples were extracted and analyzed within allowable holding times for the method.
- Some samples were analyzed at dilutions due to the high 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 seven field duplicate samples were collected during the sampling events to evaluate 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 one set of 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 evaluate 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 eleven samples. Analytical results from these samples were estimated based on this evaluation.
- The RPD between column results for the LCS/LCSD were evaluated to evaluate the precision of the results. The RPD between sample columns were determined to be within the acceptance criteria (<25%) with the exception of one LCS/LCSD reported above the laboratory acceptance limit. No qualifications were applied since the recoveries were acceptable and all associated samples were non-detect for PCBs.
- Accuracy of the analytical data was assessed by reviewing the recoveries for MS/MSD results. Results of the MS/MSD recoveries on eight of the samples were outside acceptance limits; however no qualifications were applied due to either interference from Aroclor 1254 detected in the primary sample or results being outside limits on only one of the columns.

- According to the laboratory case narratives, the lower of the two column results was reported for Aroclor 1254 results in four of the samples due to continuing calibration non-conformance. Detected Aroclor 1254 results in the four samples were estimated based on this evaluation.
- All surrogates met the acceptance criteria or were diluted out with the exception of surrogates within two samples. Results from one of the samples were not qualified due to results outside limits in only one of the columns. All non-detect results from the second sample (wipe sample MR-VWB-166 collected from epoxy coated materials on the north elevation) were rejected due to recoveries below 10%. This sample has been included on the summary tables and the figures included in Appendix B. Additional sampling is not currently anticipated due to the planned implementation of a long term monitoring program for the McNamara Residence as described in Section 7 of this Report.
- No analytes were detected in the method blanks or the field blank samples collected during the sampling events.

Based on this review, the data adequately represents the materials tested, and the samples are considered usable (with the exception of the non-detect results for verification wipe sample MR-VWB-166) 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 Plan. 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. All 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.

Wastes generated during the project were collected in secured, lined and covered roll-off waste containers and steel 55-gal drums 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 tons of material in two roll-offs (building envelope project) and six 55-gallon drums (ADA restroom upgrade project) were shipped off-site as ≥ 50 ppm PCB wastes for disposal at Environmental Quality's Wayne Disposal Landfill in Belleville, Michigan. Copies of all PCB waste shipment records including manifests and certificates of disposal are provided in Appendix D.

6. RESTORATION

Upon completion of the PCB remediation activities, all building surfaces were restored in accordance with the overall project specifications. All site controls, including fencing and scaffolding were dismantled and removed from the site. All wastes were transported off the site for proper disposal in accordance with 40 CFR 761.

7. SUMMARY AND CONCLUSIONS

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

In summary, the work completed included the following:

- Removal and off-site disposal of a total of 24 tons of bulk PCB waste (caulking, brick and other building materials, poly sheeting, etc.) contained in two roll-off containers and six 55-gallons drums. The containers were transported for off-site disposal as ≥ 50 ppm PCB waste at Environmental Quality's Wayne Disposal Landfill in Belleville, Michigan; and
- 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).

The development of a long term maintenance and monitoring plan and the assessment and remediation, if necessary, of any impacted ground surfaces will be conducted following receipt of EPA approval and completion of the remedial activities at the remaining Sylvan Complex building, the Cashin Residence, which is scheduled for 2013.

Table 2-1
Summary of Waste Segregation Verification Sampling Results - Parapet and RTU Walls

McNamara Residence
UMass Amherst

Category		Façade	Sample ID	Sample Date	Total PCBs (mg/kg)
Parapet Walls					
Below Cap Joint (23 samples)	Penthouse	South	MR-VBB-101	05/15/12	< 0.095
		North	MR-VBB-102	05/15/12	< 0.091
		South	MR-VBB-103	05/15/12	< 0.095
		North	MR-VBB-108	05/15/12	< 0.091
		North	MR-VBB-190	06/01/12	< 0.087
	Roof	West	MR-CBB-016	08/18/11	< 0.10
		South	MR-CBB-020	08/18/11	< 0.10
		East	MR-CBB-027	08/18/11	< 0.087
		North	MR-CBB-032	08/18/11	< 0.087
		North	MR-VBB-167	05/30/12	0.24
		North	MR-VBB-170	05/30/12	0.14
		North	MR-VBB-173	05/30/12	< 0.10
		North	MR-VBB-175	05/30/12	0.29
		North	MR-VBB-177	05/30/12	0.34
		North	MR-VBB-179	05/30/12	0.13
		South	MR-VBB-145	05/23/12	< 0.095
		South	MR-VBB-147	05/23/12	< 0.10
		South	MR-VBB-149	05/23/12	< 0.087
		South	MR-VBB-151	05/23/12	< 0.087
		South	MR-VBB-154	05/29/12	0.28
		South	MR-VBB-156	05/29/12	< 0.10
		South	MR-VBB-157	05/29/12	**1.8**
		South	MR-VBB-189	06/01/12	0.8
		East	MR-VBB-189	06/04/12	**6.1**
		East	MR-VBB-197	06/07/12	0.69 J
Above Horizontal Control Joint (17 samples)		West	MR-CBB-018	08/18/11	0.86
		South	MR-CBB-022	08/18/11	0.56
		East	MR-CBB-029	08/18/11	0.37
		North	MR-CBB-034	08/18/11	0.24
		North	MR-VBB-168	05/30/12	< 0.10
		North	MR-VBB-171	05/30/12	< 0.095
		North	MR-VBB-174	05/30/12	0.33
		North	MR-VBB-176	05/30/12	0.54
		North	MR-VBB-178	05/30/12	< 0.10
		North	MR-VBB-180	05/30/12	0.23
		South	MR-VBB-146	05/23/12	0.12
		South	MR-VBB-148	05/23/12	< 0.087
		South	MR-VBB-150	05/23/12	< 0.087
		South	MR-VBB-152	05/23/12	< 0.095
		South	MR-VBB-153	05/29/12	0.53
		South	MR-VBB-155	05/29/12	< 0.10
		South	MR-VBB-158	05/29/12	0.35
Away from Vertical Control Joint (6 samples)	Exterior (4 samples)	North	MR-CBB-024	08/18/11	< 0.091
		South	MR-CBB-036	08/18/11	< 0.095
		East	MR-VBB-144	05/22/12	0.1
		West	MR-VBB-159	05/29/12	0.1
	Interior (4 samples)	North	MR-VBB-122	05/18/12	0.15
		East	MR-VBB-123	05/18/12	0.2
		South	MR-VBB-124	05/18/12	0.11
		West	MR-VBB-125	05/18/12	0.25
RTU Walls					
1 per RTU		East	MR-VBB-104	05/15/12	0.45 J
		North	MR-VBB-105	05/15/12	0.17
		South	MR-VBB-106	05/15/12	0.3
		North	MR-VBB-107	05/15/12	< 0.095

Notes:
All samples extracted via method 3540C (Soxhlet Extraction) and analyzed for PCBs via USEPA method 8082.
All PCBs reported as Aroclor 1254 and/or Aroclor 1260. No other Aroclor reported above the minimum laboratory reporting limit.
(J) = Analytical results qualified as estimated based on results of data validation. Additional information provided in Appendix C.
Bold and shaded results indicate total PCBs reported > 1 ppm. Follow up sample collected at a greater distance from the joint to confirm the segregation cut line.

Table 2-2
Summary of Verification Sampling Results - Horizontal and Vertical Control Joints

McNamara Residence
UMass Amherst

Category	Location Relative to Joint	Distance from Joint (inches)	Façade	Sample ID	Sample Date	Total PCBs (mg/kg)
Horizontal Control Joints						
High Occupancy Areas (8 samples)	Below the Joint	approximately 8 (fourth row of brick)	North	MR-VBB-126	05/18/12	0.73
			South	MR-VBB-130	05/18/12	0.75
			East	MR-VBB-128	05/18/12	0.096
			West	MR-VBB-285	07/31/12	0.12
	Above the Joint	approximately 2.5 (second row of brick)	North	MR-VBB-127	05/18/12	0.12
			South	MR-VBB-131	05/18/12	0.13
			East	MR-VBB-129	05/18/12	0.23
			West	MR-VBB-284	07/31/12	0.14
Low Occupancy Areas (25 samples)	Below the Joint	0.5 to 1.0	North	MR-VBB-110	05/15/12	0.47 J
				MR-VBB-116	05/17/12	11
				MR-VBB-118	05/17/12	1.7
				MR-VBB-132	05/18/12	4.0
				MR-VBB-140	05/21/12	0.57
				MR-VBB-142	05/21/12	12
			South	MR-VBB-225	07/10/12	17
				MR-VBB-260	07/25/12	2.5
				MR-VBB-262	07/25/12	0.72
				MR-VBB-264	07/25/12	0.68
			East	MR-VBB-135	05/21/12	2.8
				MR-VBB-137	05/21/12	2.5 J
			West	MR-VBB-206	06/14/12	0.48
	Above the Joint	0.5 to 1.0	North	MR-VBB-112	05/16/12	0.48
				MR-VBB-120	05/17/12	1.4
				MR-VBB-133	05/18/12	< 0.095
				MR-VBB-143	05/21/12	**160***
			South	MR-VBB-224	07/10/12	**280***
				MR-VBB-241	07/20/12	< 0.10
				MR-VBB-242	07/20/12	0.46
				MR-VBB-244	07/20/12	0.21
				MR-VBB-261	07/25/12	< 0.10
				MR-VBB-263	07/25/12	0.21
			East	MR-VBB-136	05/21/12	2.8
			West	MR-VBB-205	06/14/12	3.4

Table 2-2
Summary of Verification Sampling Results - Horizontal and Vertical Control Joints

McNamara Residence
UMass Amherst

Category	Location Relative to Joint	Distance from Joint (inches)	Façade	Sample ID	Sample Date	Total PCBs (mg/kg)
Vertical Control Joints						
High Occupancy Areas (6 samples)	Adjacent to Joint	approximately 8 (second full row of brick)	North	MR-VBB-114	05/17/12	**3.1**
				MR-CBB-055	01/06/12	0.076
			South	MR-VBB-134	05/18/12	0.11
				MR-VBB-203	06/14/12	0.38
			West	MR-VBB-113	05/17/12	0.11
			East	MR-VBB-115	05/17/12	0.12
Low Occupancy Areas (8 samples)	Adjacent to Joint	approximately 8 (second full row of brick)	North	MR-VBB-109	05/15/12	< 0.10
				MR-VBB-111	05/16/12	< 0.10
				MR-VBB-121	05/17/12	< 0.091
				MR-VBB-141	05/21/12	6.8
			South	MR-VBB-226	7/11/12	< 0.091
				MR-VBB-243	7/20/12	0.25
			West	MR-VBB-117	05/17/12	< 0.095
			East	MR-VBB-138	05/21/12	0.27

Notes:
All samples extracted via method 3540C (Soxhlet Extraction) and analyzed for PCBs via USEPA method 8082.
All PCBs reported as Aroclor 1254 and/or Aroclor 1260. No other Aroclor reported above the minimum laboratory reporting limit.
(J) = Analytical results qualified as estimated based on results of data validation. Additional information provided in Appendix C.
Bold and shaded results indicate total PCBs reported > 1 ppm (high occupancy areas) or > 25 ppm (low occupancy areas).
* Sample deemed not representative given potential cross contamination from existing PCB caulking.

Table 2-3
Summary of Epoxy Coating Verification Wipe Sampling Results -Horizontal and Vertical Control Joints

McNamara Residence
UMass Amherst

Occupancy	Façade	Sample ID	Follow Up Sample	Sample Date	Total PCBs (ug/wipe)
Horizontal Control Joints					
High	North	MR-VWB-184		06/01/12	**4.7**
			MR-VWB-232	07/19/12	< 0.20
		MR-VWB-287		07/31/12	0.35 J
	South	MR-VWB-227		07/12/12	0.38 J
	East	MR-VWB-219		06/22/12	< 0.20
	West	MR-VMB-275		07/30/12	0.33
Low	North	MR-VWB-164		05/29/12	0.67
		MR-VWB-165		05/29/12	**2.6**
			MR-VWB-289	07/31/12	<0.2
		MR-VWB-186		06/01/12	0.57
		MR-VWB-187		06/01/12	0.66
		MR-VWB-188		06/01/12	0.29
		MR-VWB-194		06/06/12	< 0.20
		MR-VWB-195		06/06/12	0.86
		MR-VWB-280		07/30/12	**1.3**
		MR-VWB-277		07/30/12	**1.2**
	South	MR-VWB-196		06/07/12	0.4
		MR-VWB-228		07/12/12	0.6 J
		MR-VWB-252		07/23/12	< 0.20
		MR-VWB-254		07/23/12	< 0.20
		MR-VWB-256		07/25/12	0.67
		MR-VWB-257		07/25/12	**1.15**
		MR-VWB-266		07/26/12	0.27
		MR-VWB-267		07/26/12	0.84
		MR-VWB-268		07/26/12	<0.2
		MR-VWB-273		07/30/12	0.75
	East	MR-VWB-216		06/20/12	0.27
		MR-VWB-217		06/22/12	0.33
		MR-VWB-218		06/22/12	**2.4**
			MR-VWB-278	07/30/12	0.52
	West	MR-VWB-235		07/19/12	0.33
		MR-VWB-281		07/30/12	0.31

Table 2-3
Summary of Epoxy Coating Verification Wipe Sampling Results -Horizontal and Vertical Control Joints

McNamara Residence
UMass Amherst

Occupancy	Façade	Sample ID	Follow Up Sample	Sample Date	Total PCBs (ug/wipe)
Vertical Control Joints					
High	North	MR-VWB-185		06/01/12	**8.8**
			MR-VWB-233	07/19/12	**9**
		MR-VWB-270		07/27/12	**95**
		MR-VWB-271		07/27/12	< 0.20
	South	MR-VWB-269		07/27/12	**25**
Low	North	MR-VWB-162		05/29/12	0.36 J
		MR-VWB-163		05/29/12	**1.3**
			MR-VWB-276	07/30/12	**5.2**
		MR-VWB-166		05/30/12	< 0.20 R
		MR-VWB-251		07/23/12	**20.6**
			MR-VWB-279	07/30/12	**250**
	South	MR-VWB-253		07/23/12	**2.5**
		MR-VWB-255		07/25/12	**2.0**
		MR-VWB-272		07/27/12	**6.6**
	East	MR-VWB-282		7/30/2012	**170**
		MR-VWB-229		07/12/12	**1.1**
	West	MR-VWB-274		07/30/12	**13**
		MR-VWB-236		07/19/12	**25.7**
			MR-VWB-283	07/30/12	0.78 J

Notes:
Verification wipe samples collected using hexane-soaked wipes using modified wipe sample procedure (use of tweezers) over 31 inches of joint based on a width of 1/2" .
All samples extracted via method 3540C (Soxhlet Extraction) and analyzed for PCBs via USEPA method 8082.
All PCBs reported as Aroclor 1254. No other Aroclors reported above the minimum laboratory reporting limit.
(J) = Analytical results qualified as estimated based on results of data validation. Additional information provide in Appendix C.
(R) = Analytical results rejected due to PCB surrogate recoveries outside acceptance criteria.

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

McNamara Residence
UMass Amherst

Sample ID	Sample Date	Total PCBs (ug/wipe) (2 coats)	Follow Up Sample	Sample Date	Total PCBs (ug/wipe) (3 coats)
Horizontal Control Joints - North Elevation					
MR-VWB-182	06/01/12	**8.8**	MR-VWB-230	07/19/12	**2.1**
MR-VWB-190	06/04/12	**8.8**	MR-VWB-234	07/19/12	**8.9**
Vertical Control Joints - North Elevation					
MR-VWB-183	06/01/12	**19**	MR-VWB-231	07/19/12	**3**
MR-VWB-191	06/04/12	**1.4**	MR-VWB-247	07/20/12	**6.9**
MR-VWB-169	05/30/12	**8.6**	-	-	**-**
MR-VWB-172	05/30/12	**59**	-	-	**-**
MR-VWB-192	06/04/12	**1.6**	MR-VWB-246	07/20/12	**20**
Pilot Test - East Elevation					
MR-VWB-209	06/18/12	**1.5**	-	-	**-**
MR-VWB-222	06/27/12	< 0.20	-	-	**-**
MR-VWB-210	06/18/12	**2.0**	-	-	**-**
MR-VWB-221	06/27/12	< 0.20	-	-	-

Notes:
Samples collected in accordance with the standard wipe test method of 40 CFR 761.123.
Samples submitted for extraction via method 3540C (Soxhlet) and analyzed for PCBs via method 8082.
All PCBs reported as Aroclor 1254. No other Aroclors reported above the minimum laboratory reporting limits.

Table 2-5
Summary of Final Clear Coating Verification Wipe Sampling Results

McNamara Residence
University of Massachusetts Amherst

Category	Occupancy	Façade	Sample ID	Sample Date	Total PCBs (ug/wipe)
Horizontal Control Joints					
Clear Coat Wipe Samples (1 per 50 l.f.)	High (5 samples)	North	MR-VWB-512	11/23/12	< 0.20
			MR-VWB-511	11/23/12	**0.75**
		South	MR-VWB-506	11/23/12	**0.71 J**
			MR-VWB-503	11/23/12	< 0.20
		East	MR-VWB-501	11/23/12	**0.23**
		West	MR-VWB-508	11/23/12	**0.21**
Vertical Control Joints					
Clear Coat Wipe Samples (High Occupancy - 1 per 50 l.f.) (Low Occupancy - 1 per 200 l.f.)	High (6 samples)	North	MR-VWB-518	11/23/12	**0.45**
			MR-VWB-519	11/23/12	**2.3**
		South	MR-VWB-515	11/23/12	**2.2 J**
			MR-VWB-504	11/23/12	**1.9**
		East	MR-VWB-520	11/23/12	**0.55**
		West	MR-VWB-517	11/23/12	**0.80**
	Low (8 samples)	North	MR-VWB-514	11/23/12	**0.99**
			MR-VWB-513	11/23/12	**2 J**
			MR-VWB-510	11/23/12	**0.42 J**
		South	MR-VWB-507	11/23/12	**1.5 J**
			MR-VWB-505	11/23/12	**1.4**
			MR-VWB-502	11/23/12	**0.20**
		East	MR-VWB-500	11/23/12	**1.5**
		West	MR-VWB-509	11/23/12	**1.3**

Notes:
Samples collected in accordance with the standard wipe test method of 40 CFR 761.123.
Samples submitted for extraction via method 3540C (Soxhlet) and analyzed for PCBs via method 8082.
All PCBs reported as Arcolor 1254. No other Aroclor reported above the minimum laboratory reporting limits.

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

McNamara Residence
UMass Amherst

Category	Location	Distance from Joint (inches)	Sample ID	Sample Date	Total PCBs (mg/kg)
Horizontal Ceiling Joints					
Bulk Samples	Men's	4	MR-VBC-198	6/11/2012	2.81
	Men's	10	MR-VBC-207	6/14/2012	8.4
	Women's	12	MR-VBC-208	6/14/2012	10.9
Epoxy Wipe Samples	Men's	0	MR-VWB-214	06/19/12	0.31
	Women's	0	MR-VWB-215	06/19/12	1.6
		0	MR-VWC-223	06/28/12	< 0.020
Vertical Joints - Concrete Columns					
Epoxy Wipe Samples	Hallway	0	MR-VWB-212	06/19/12	< 0.20
	Hallway	0	MR-VWB-211	06/19/12	0.5
	Men's Room	0	MR-VWB-291	08/21/12	1.3
	Women's Room	0	MR-VWB-292	08/21/12	1.5
Concrete Away From the Caulked Joint					
Final Acrylic Coated Concrete Ceiling	Men's	12	MR-VWC-290	8/14/2012	< 0.20
	Women's	12	MR-VWC-286	07/31/12	0.43

Notes:
Samples collected in accordance with the standard wipe test method of 40 CFR 761.123.
All samples extracted via method 3540C (Soxhlet Extraction) and analyzed for PCBs via USEPA method 8082.
All PCBs reported as Aroclor 1254. No other Aroclor reported above the laboratory minimum reporting limits.

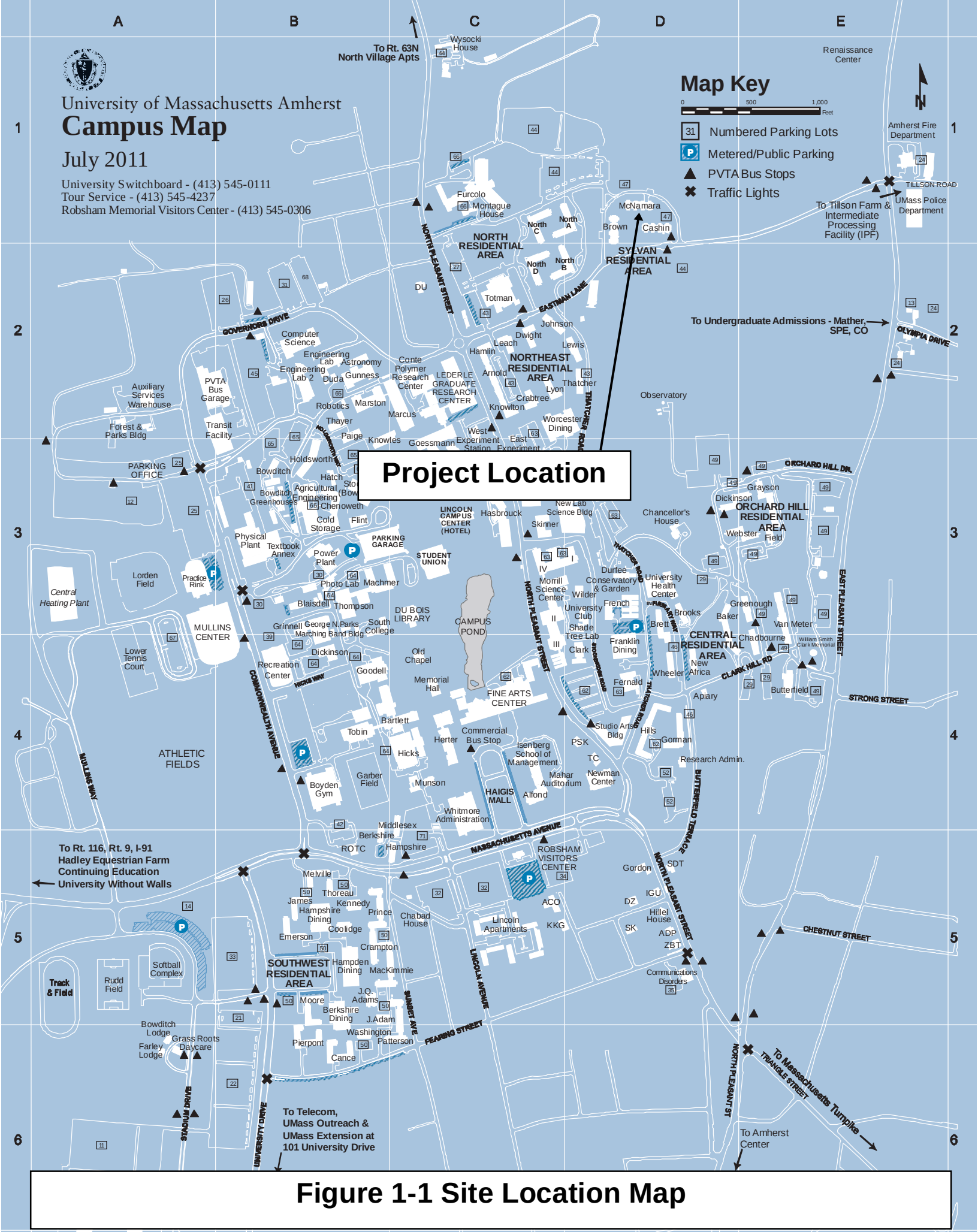


Figure 1-1 Site Location Map

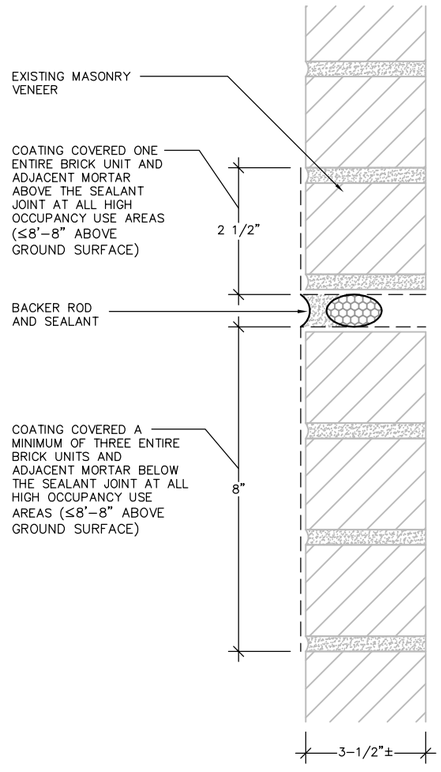
TYPICAL HORIZONTAL CONTROL JOINT

SCALE: NOT TO SCALE

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

Above Horizontal Control Joints		
Distance Above the Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
2.5 (2nd Row of Brick)	MR-VBB-127	0.12
	MR-VBB-131	0.13
	MR-VBB-129	0.23
	MR-VBB-284	0.14

Below Horizontal Control Joints		
Distance Below the Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
8 (4th Row of Brick)	MR-VBB-126	0.73
	MR-VBB-130	0.75
	MR-VBB-128	0.096
	MR-VBB-285	0.12



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

Above Horizontal Control Joints		
Distance Above the Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
0.5 to 1.0	MR-VBB-112	0.48
	MR-VBB-120	1.4
	MR-VBB-133	< 0.095
	MR-VBB-143	160*
	MR-VBB-224	280*
	MR-VBB-241	< 0.10
	MR-VBB-242	0.46
	MR-VBB-244	0.21
	MR-VBB-261	< 0.10
	MR-VBB-263	0.21
	MR-VBB-136	2.8
	MR-VBB-205	3.4

Below Horizontal Control Joints		
Distance Below the Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
0.5 to 1.0	MR-VBB-110	0.47 J
	MR-VBB-116	11
	MR-VBB-118	1.7
	MR-VBB-132	4.0
	MR-VBB-140	0.57
	MR-VBB-142	12
	MR-VBB-225	17
	MR-VBB-260	2.5
	MR-VBB-262	0.72
	MR-VBB-264	0.68
	MR-VBB-135	2.8
	MR-VBB-137	2.5 J
	MR-VBB-206	0.48

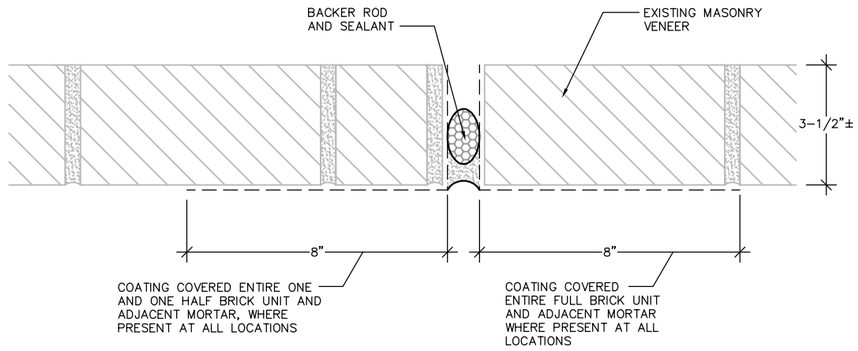
* SAMPLE DEEMED NOT REPRESENTATIVE GIVEN POTENTIAL CROSS CONTAMINATION FROM EXISTING PCB CAULKING.

NOTE:

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.

TYPICAL VERTICAL CONTROL JOINT (PLAN)

SCALE: NOT TO SCALE



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

Vertical Control Joints		
Distance From Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
8	MR-VBB-114	3.1
	MR-VBB-134	0.11
	MR-VBB-203	0.38
	MR-VBB-113	0.11
	MR-VBB-115	0.12

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

Vertical Control Joints		
Distance From Joint (inches)	**Sample ID**	**Total PCBs (ppm)**
8	MR-VBB-109	< 0.10
	MR-VBB-111	< 0.10
	MR-VBB-121	< 0.091
	MR-VBB-141	6.8
	MR-VBB-226	< 0.091
	MR-VBB-243	0.25
	MR-VBB-117	< 0.095
	MR-VBB-138	0.27

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

SUMMARY OF BRICK SAMPLING RESULTS HORIZONTAL AND VERTICAL CONTROL JOINTS

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

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: AS NOTED

FIGURE 2-1

\\Andover\Projects\224867 UMass Amherst – McNamara Residence PCBs\wip\Drawings\Status Report\Figure 2–1.dwg

APPENDIX A: DUST MONITORING RESULTS

Appendix A
Summary of Perimeter Dust Monitoring - Envelope Repair Project

McNamara Residence
UMass Amherst

Date	Time	Location	Dust (mg/m^3)	Site Activities
5/16/2012	9:00	Bkgd	0.015	Compass doing mockups at high occupancy horizontal control joints.
	9:01	1	0.013	
	11:00	Bkgd	0.007	
	11:01	1	0.011	
	13:00	Bkgd	0.015	
	13:01	1	0.029	
	15:00	Bkgd	0.012	
	15:01	1	0.017	
5/17/2012	13:00	Bkgd	0.003	
	13:01	1	0.010	
	14:30	Bkgd	0.000	
	14:31	1	0.006	
5/24/2012	7:30	Bkgd	0.013	Segregation of parapet wall materials on south elevation.
	7:31	1	0.022	
	9:15	Bkgd	0.018	
	9:16	1	0.019	
	11:30	Bkgd	0.009	
	11:31	1	0.008	
	13:15	Bkgd	0.001	
	13:16	1	0.003	
	14:30	Bkgd	0.011	
	14:31	1	0.025	
5/29/2012	12:15	Bkgd	0.035	Segregation of parapet wall materials on south elevation and control joint removal on north elevation.
	12:16	1	0.034	
	12:18	2	0.032	
	12:20	3	0.034	
	13:50	Bkgd	0.034	
	13:56	1	0.043	
	13:58	2	0.033	
	13:58	3	0.037	
	14:02	Bkgd	0.035	
	14:04	1	0.144	
	14:05	2	0.037	
	14:07	3	0.036	
5/30/2012	7:30	Bkgd	0.031	Segregation of parapet wall materials on south elevation and control joint removal on north elevation.
	7:35	1	0.030	
	7:36	2	0.032	
	7:38	3	0.045	
	7:41	4	0.040	
	9:50	Bkgd	0.021	
	9:51	1	0.025	
	9:52	2	0.023	
	9:55	3	0.051	
	9:57	4	0.030	
	7:57	Bkgd	0.023	
	7:58	1	0.017	
	7:59	2	0.019	
	8:00	3	0.011	
	9:59	Bkgd	0.012	
	10:00	1	0.024	
	10:01	2	0.038	
	10:03	3	0.024	

Appendix A
Summary of Perimeter Dust Monitoring - Envelope Repair Project

McNamara Residence
UMass Amherst

Date	Time	Location	Dust (mg/m^3)	Site Activities
6/1/2012	8:30	Bkgd	0.018	Segregation of parapet wall materials on south elevation and control joint removal on north elevation.
	8:31	1	0.012	
	8:32	2	0.009	
	8:33	3	0.007	
6/1/2012	9:38	Bkgd	0.002	
	9:39	1	0.004	
	9:40	2	0.007	
	9:41	3	0.008	
6/7/2012	9:30	Bkgd	0.009	Parapet Wall demolition at mechanical room penthouse, removal of waste from the roof area
	9:32	1	0.088	
	9:34	2	0.040	
	9:35	3	0.038	
	11:57	Bkgd	0.008	
	11:52	1	0.013	
	11:53	2	0.078	
	11:54	3	0.018	
6/14/2012	12:30	Bkgd	0.036	Segregation of building parapet wall on east elevation and penthouse parapet at mechanical room penthouse.
	12:32	1	0.115	
	12:33	2	0.063	
	12:34	3	0.043	
6/18/2012	10:30	Bkgd	0.035	Segregation of parapet wall materials at east corner of north elevation.
	10:31	1	0.068	
	10:32	2	0.046	
	10:33	3	0.053	
	13:10	Bkgd	0.025	
	13:12	1	0.037	
	13:14	2	0.021	
	13:20	3	0.049	
6/19/2012	9:05	Bkgd	0.028	Segregation of parapet wall materials on north elevation due north of mechanical penthouse.
	9:07	1	0.1	
	9:09	2	0.101	
	9:12	3	0.063	
	11:15	Bkgd	0.110	
	11:17	1	0.034	
	11:19	2	0.078	
	11:21	3	0.097	
6/22/2012	11:45	Bkgd	0.080	Limited removal of controls joints.
	11:47	1	0.071	
	11:49	2	0.127	
	11:51	3	0.072	
6/25/2012	10:05	Bkgd	0.052	Control joint removal and preparation for segregation of parapet wall materials from western portion of north elevation.
	10:07	1	0.042	
	10:09	2	0.040	
	10:11	3	0.045	
7/3/2012	14:15	Bkgd	0.032	Control joint removal on east elevation, north and south of stairwell.
	14:17	1	0.026	
	14:19	2	0.035	
	14:20	3	0.034	

Appendix A
Summary of Perimeter Dust Monitoring - Envelope Repair Project

McNamara Residence
UMass Amherst

Date	Time	Location	Dust (mg/m^3)	Site Activities
7/5/2012	9:45	Bkgd	0.052	Control joint removal from HCJs and VCJs at south and east end of building.
	9:46	1	0.039	
	9:48	2	0.043	
	9:50	3	0.043	
	14:30	Bkgd	0.041	
	14:32	1	0.042	
	14:33	2	0.050	
	14:35	3	0.035	
7/6/2012	9:30	Bkgd	0.059	Control joint removal from south and east elevation.
	9:32	1	0.041	
	9:34	2	0.047	
	9:37	3	0.029	
7/9/2012	11:35	Bkgd	0.037	Control joint removal from south elevation.
	11:37	1	0.039	
	11:39	2	0.038	
	11:41	3	0.038	
7/11/2012	9:50	Bkgd	0.046	Control joint removal from south elevation. Crew shutdown caulking removal after lunch.
	9:53	1	0.054	
	9:55	2	0.053	
	9:57	3	0.073	
	11:35	Bkgd	0.048	
	11:37	1	0.049	
	11:39	2	0.052	
	11:42	3	0.041	
7/12/2012	7:45	Bkgd	0.043	Control joint removal on south elevation.
	7:47	1	0.048	
	7:49	2	0.053	
	7:51	3	0.047	
	10:30	Bkgd	0.056	
	10:32	1	0.042	
	10:34	2	0.060	
	10:36	3	0.069	
7/13/2012	7:45	Bkgd	0.053	Control joint removal on south elevation.
	7:46	1	0.049	
	7:48	2	0.060	
	7:50	3	0.056	
	11:42	Bkgd	0.058	
	11:41	1	0.049	
	11:40	2	0.064	
	11:39	3	0.072	
7/16/2012	7:50	Bkgd	0.045	Control joint removal on south elevation.
	7:52	1	0.049	
	7:54	2	0.047	
	7:56	3	0.058	
	10:40	Bkgd	0.067	
	10:42	1	0.073	
	10:44	2	0.071	
	10:45	3	0.073	

Appendix A
Summary of Perimeter Dust Monitoring - Envelope Repair Project

McNamara Residence
UMass Amherst

Date	Time	Location	Dust (mg/m^3)	Site Activities
7/17/2012	9:00	Bkgd	0.076	Control joint removal on south and west elevations.
	9:02	1	0.055	
	9:04	2	0.079	
	9:06	3	0.065	
	14:15	Bkgd	0.309	
	14:17	1	0.073	
	14:19	2	0.068	
	14:21	3	0.120	
7/18/2012	8:40	Bkgd	0.098	Control joint removal on south and west elevations.
	8:42	1	0.110	
	8:44	2	0.099	
	8:46	3	0.094	
	8:48	4	0.063	
	11:22	Bkgd	0.068	
	11:24	1	0.062	
	11:26	2	0.034	
	13:25	Bkgd	0.079	
	13:27	1	0.128	
	13:30	2	0.074	
	13:32	3	0.075	
7/19/2012	9:30	Bkgd	0.055	Control joint removal on south and west elevations.
	9:32	1	0.050	
	9:34	2	0.049	
	9:36	3	0.051	
	11:40	Bkgd	0.058	
	11:42	1	0.069	
	11:44	2	0.062	
	11:46	3	0.071	

Notes: All dust readings collected using a Thermo Electron PDR-1000AN calibrated daily including.

Appendix A
Summary of Perimeter Dust Monitoring - ADA Restroom Renovations

McNamara Residence
UMass Amherst

Date	Time	Location	Dust (mg/m^3)	Site Activities
6/14/2012	8:15	Bkgd	0.023	AccuTech doing removal of caulking and adjacent brick at various joints within first floor restrooms.
	8:16	1	0.044	
	8:17	2	0.007	
	12:45	Bkgd	0.055	
	12:46	1	0.063	
	12:47	2	0.037	
6/15/2012	9:00	Bkgd	0.012	AccuTech doing removal of caulking and adjacent brick at various joints within first floor restrooms.
	9:01	1	0.062	
	9:02	2	0.020	

Notes: All dust readings collected using a Thermo Electron PDR-1000AN calibrated daily including.

APPENDIX B: VERIFICATION SAMPLE LOCATIONS

1 SOUTH ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VBB-225	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS
MR-VBB-243	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS
MR-VBB-146	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL HORIZONTAL CONTROL JOINTS FOR WASTE SEGREGATION
MR-VBB-124	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL VERTICAL CONTROL JOINTS FOR WASTE SEGREGATION
MR-VBB-106	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – RTU WALL FOR WASTE SEGREGATION (SAMPLE LOCATIONS BEHIND PARAPET WALLS AS SHOWN)

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

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BULK VERIFICATION SAMPLE LOCATIONS SOUTH ELEVATION

DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–1.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-1

1 NORTH ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VBB-116 ■	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS
MR-VBB-121 ■	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS
MR-VBB-177 □	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL HORIZONTAL CONTROL JOINTS FOR WASTE SEGREGATION
MR-VBB-122 □	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL VERTICAL CONTROL JOINTS FOR WASTE SEGREGATION
MR-VBB-105 □	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – RTU WALL FOR WASTE SEGREGATION (SAMPLE LOCATIONS BEHIND PARAPET WALLS AS SHOWN)

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

BULK VERIFICATION SAMPLE LOCATIONS NORTH ELEVATION

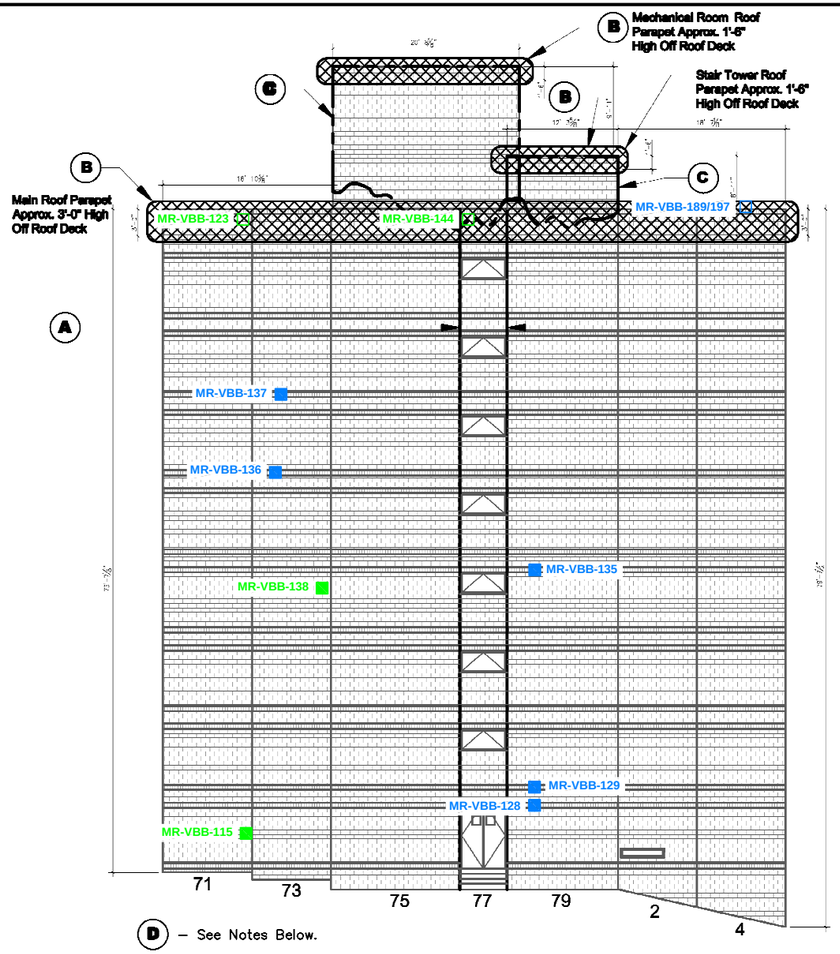
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–2.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

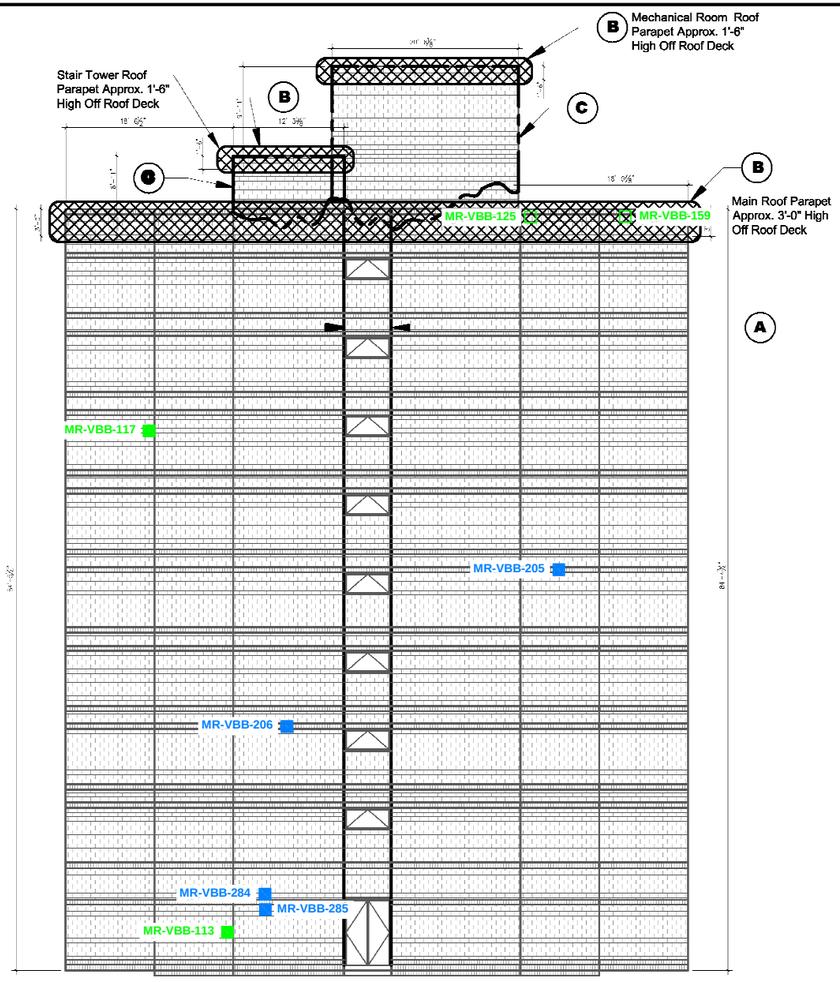
JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-2



1 EAST ELEVATION

Scale: ⅛" = 1'–0"



2 WEST ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VBB-205	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS
MR-VBB-117	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS
MR-VBB-189/197	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL HORIZONTAL CONTROL JOINTS FOR WASTE SEGREGATION
MR-VBB-159	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER – PARAPET WALL VERTICAL CONTROL JOINTS FOR WASTE SEGREGATION

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

BULK VERIFICATION SAMPLE LOCATIONS
EAST AND WEST ELEVATION

DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–3.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-3

1 SOUTH ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VBB-227 ▲	EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS
MR-VBB-272 ▲	EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS
MR-VWB-506 △	CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS (NOVEMBER 2012 SAMPLING EVENT)
MR-VWB-502 △	CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS (NOVEMBER 2012 SAMPLING EVENT)

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VERIFICATION WIPE SAMPLE LOCATIONS SOUTH ELEVATION

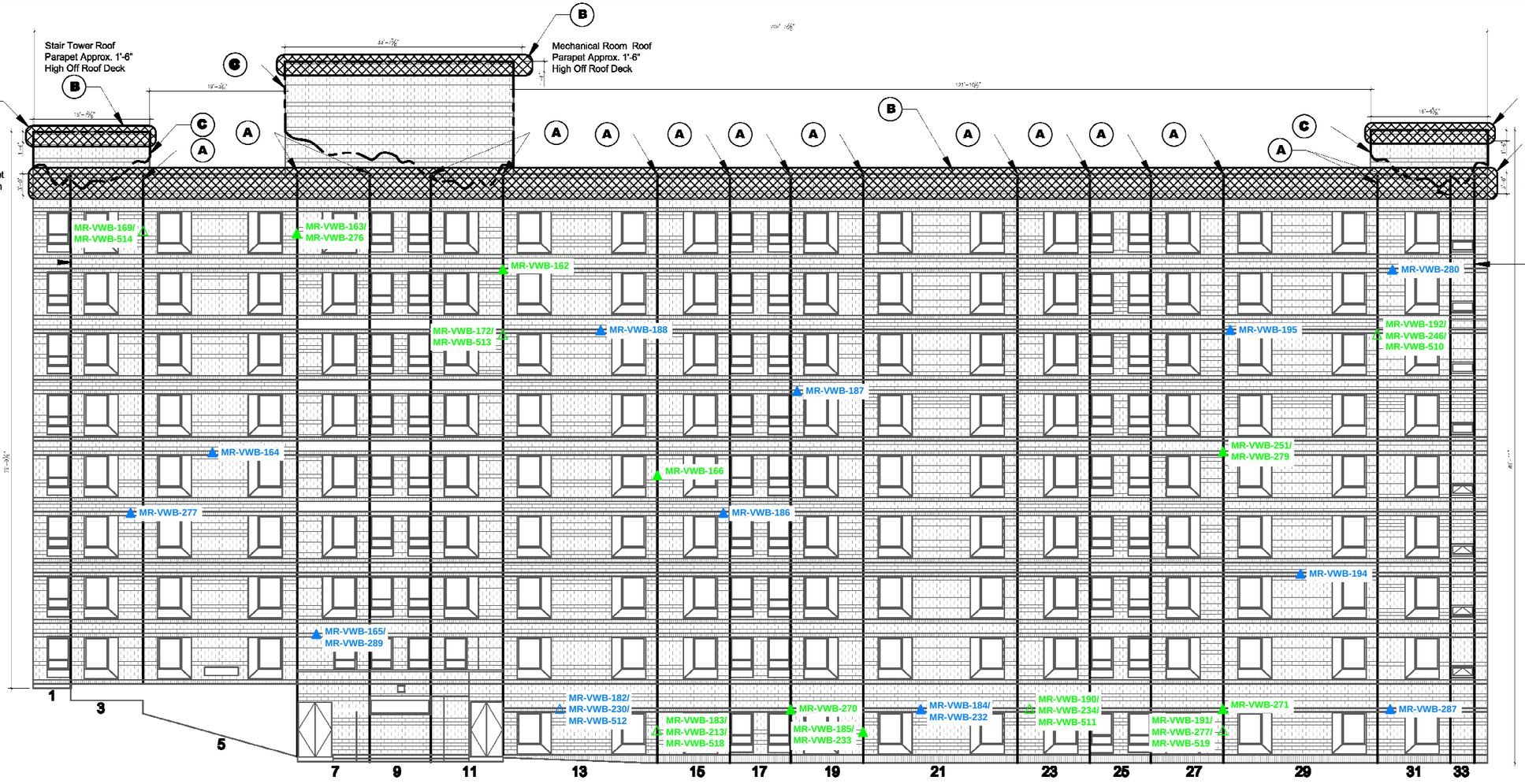
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–4.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-4



1 NORTH ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VBB-280 ▲	EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS
MR-VBB-166 ▲	EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS
MR-VWB-512 △	CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS (NOVEMBER 2012 SAMPLING EVENT)
MR-VWB-518 △	CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VERIFICATION WIPE SAMPLE LOCATIONS NORTH ELEVATION

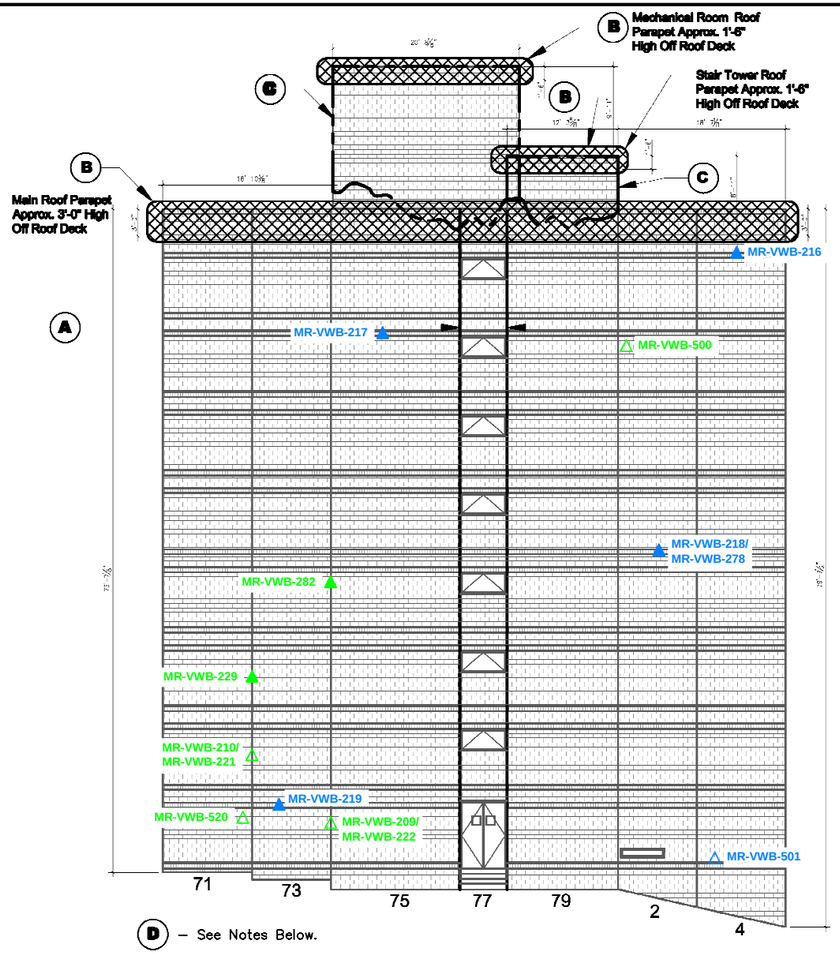
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–5.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

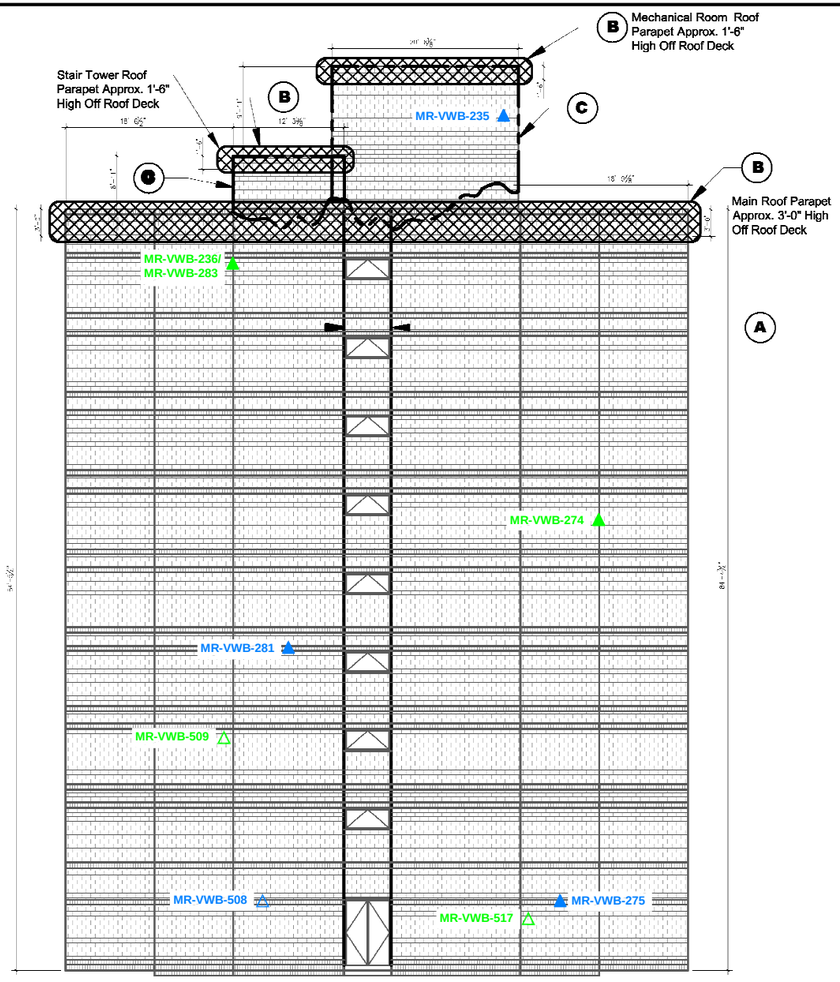
JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-5



1 EAST ELEVATION

Scale: ⅛" = 1'–0"



2 WEST ELEVATION

Scale: ⅛" = 1'–0"

LEGEND

MR-VWB-275 ▲ EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS

MR-VWB-274 ▲ EPOXY COATING VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS

MR-VWB-508 △ CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – HORIZONTAL CONTROL JOINTS (NOVEMBER 2012 SAMPLING EVENT)

MR-VWB-509 △ CLEAR COAT VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER – VERTICAL CONTROL JOINTS

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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

VERIFICATION WIPE SAMPLE LOCATIONS EAST AND WEST ELEVATION

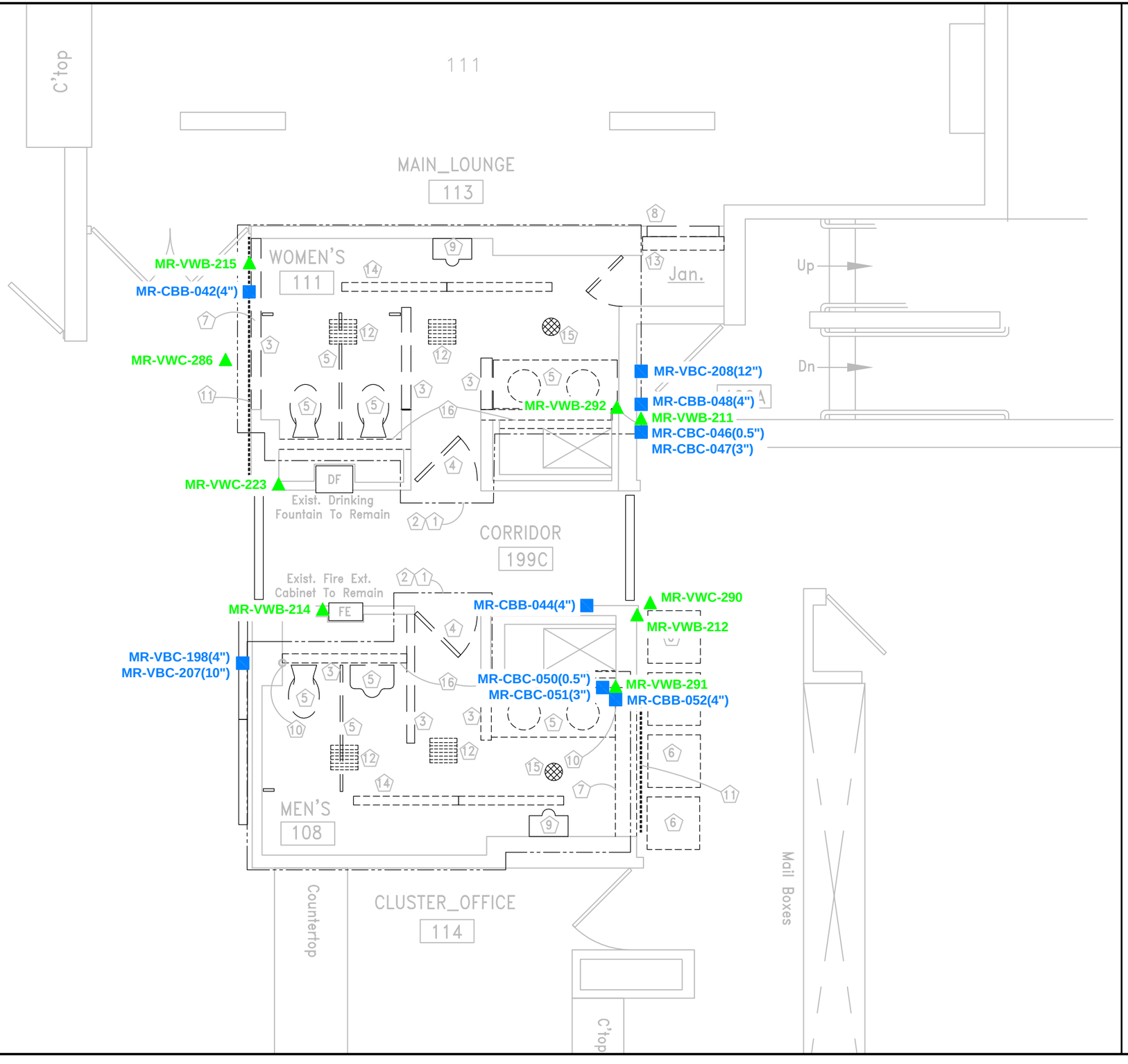
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B–6.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: FEBRUARY 2013
SCALE: N.T.S.

Appendix B-6



LEGEND

MR-VBC-207 ■ BULK SAMPLE LOCATION AND IDENTIFIER. DISTANCE FROM JOINT INCLUDED IN PARENTHESIS.

MR-VWC-211 ▲ 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. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

SAMPLE LOCATIONS
ADA UPGRADE AREA

DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
APPENDIX B-7.DWG

UMASS MCNAMARA RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION STATUS REPORT

JOB NO: 224867
DATE: MARCH 2013
SCALE: N.T.S.

Appendix B-7

APPENDIX C: ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION SUMMARIES

PCB Remediation Plan

Cashin Residence

University of Massachusetts

Amherst, Massachusetts

Project No. 226020.00

University of Massachusetts

March 2013

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1. INTRODUCTION

This Remediation Plan (Plan) has been prepared by Woodard & Curran on behalf of the University of Massachusetts (UMass) to comply with U.S. Environmental Protection Agency (EPA) requirements for a polychlorinated biphenyl (PCB) cleanup and disposal under 40 CFR Part 761.61. This plan describes the data collected and details the proposed remedial approach for PCB-containing caulking and PCB-impacted building materials to be encountered during planned repairs and renovations at the Cashin Residence dormitory located within the Sylvan Residential Area at 112 Eastman Lane on the UMass Campus in Amherst, Massachusetts.

The Sylvan Residential Area consists of three dormitories, all of similar construction and built consecutively. These buildings are referred to as the Brown, McNamara, and Cashin Residences (see Figure 1-1). UMass is undertaking a three year building envelope repair at each of these buildings and to date remediation activities have been substantially completed at the Brown (2011) and the McNamara (2012) residences. The proposed remediation activities for the Cashin Residence building envelope repair project are the same as those completed at the Brown and McNamara Residences and are scheduled to be completed during the summer of 2013.

Typical Building Construction – Sylvan Residential Complex

1.1 BACKGROUND

The Sylvan Residential Area was constructed in 1971 and includes three residential dormitories for undergraduate students. The Cashin Residence is the eastern most dormitory located in the Sylvan Residential area on Eastman Lane (see Figure 1-1). The Brown Residence is located along the west side of the complex and the McNamara Residence is located on the north side of the complex. The buildings are of similar construction including nine stories with suite style living space on the second through eighth floors and common areas and meeting rooms on the basement and first floors. The Cashin Residence has a total footprint of approximately 11,800 square feet.

The Sylvan Residential area is surrounded by a roadway, parking and open or wooded areas. Areas in the immediate vicinity of the Cashin Residence are sloped toward the building on the south side and generally flat or slightly sloped northerly towards the McNamara Residence, westerly toward the Brown Residence and easterly toward a broad wooded area. These sloped areas are either covered with grass, asphalt pavement, concrete, or landscaped areas.

1.2 CONCEPTUAL SITE MODEL

Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1950's and late 1970's is known to have been manufactured with PCBs. PCBs were added to caulking for durability, resistance to degradation, and as a softener/plasticizer for application. Due to the porous nature of concrete and other masonry surfaces, PCBs in caulking may penetrate into adjacent materials during application or over time, may leach or weather, and/or may be disturbed during renovations or other work. Production and approved usage of PCBs was halted in the United States in the late 1970s. As indicated above, the Sylvan Residential Area buildings were constructed during this time period.

In preparation for the building envelope repair, a materials survey was conducted to check for the presence of various hazardous materials that may be encountered during the project. This included inspection and sampling of caulking materials for asbestos and PCBs. Because of the similarities in construction, the remediation plans

developed for the Brown Residence remediation activities in 2011 and the McNamara Residence in 2012 were used as a basis for the materials survey and characterization samples collected from the Cashin Residence.

Caulking was observed within planned work areas during the survey and samples were collected for analysis. Results from the sealant sampling indicated that the majority of the samples contained PCBs at concentrations ≥ 50 parts per million (ppm).

Characterization samples of building materials adjacent to the ≥ 50 ppm PCB-containing sealants were collected to determine the nature and extent of PCBs in these materials. Characterization sample results have been used, in conjunction with the overall renovation plan, to develop a remediation plan for the removal and disposal of ≥ 50 ppm PCB-containing caulking and adjacent building materials; or, where adjacent material removal is infeasible, the in-place management of building materials impacted by PCBs at concentrations above the applicable occupancy use criteria.

The current and anticipated schedule of work for the envelope repair project is to begin following the conclusion of the 2013 spring semester. The majority of the work is anticipated to be completed prior to the return of students in the fall.

1.3 PLAN ORGANIZATION

This Remediation Plan is organized into the following sections:

Section 2: Sample Collection, Analyses, and Data Usability

This section provides a summary of the characterization data that have been collected to determine the nature and extent of PCBs in each media.

Section 3: Remediation Plan Overview

This section includes an overview of the remedial objectives, cleanup levels, and plans for the project.

Section 4: Preparation, Communications, and Controls

This section outlines the methods that will be used by the project team relative to site preparation, security, and communication.

Section 5 through 7: Proposed Remedial Activities

The proposed remedial activities are presented for each of the work areas identified as containing ≥ 50 ppm PCB caulking and a verification approach is proposed to demonstrate task completion.

Section 8: Waste Storage and Disposal

This section includes the proposed on-site waste storage practices that will be implemented during remediation and the selected disposal facilities for off-site disposal of PCB waste materials.

Section 9: Conceptual Monitoring and Maintenance Plan

This section includes a summary of the anticipated long term monitoring and maintenance plan that will be proposed for implementation throughout the Sylvan Complex.

Section 10: Project Schedule and Restoration

This section includes a brief description of when the PCB remediation activities are planned to be conducted and how site restoration will be achieved.

Section 11: Recordkeeping and Documentation

This section summarizes the recordkeeping and reporting requirements that will be applicable following completion of the PCB remediation activities included in this plan.

1.4 CERTIFICATION

The following is information regarding the entity submitting this Plan:

University of Massachusetts
Environmental Health and Safety
40 Campus Center Way
Amherst, MA 01003-9244

Donald Robinson, PhD
Director, Environmental Health and Safety

A copy of the written certification signed by the owner of the property and required as part of this plan submittal is provided in Appendix A.

2. SAMPLE COLLECTION, ANALYSIS, AND DATA USABILITY

Results of a building survey were used to develop a characterization sampling plan for caulking and adjacent building materials. During characterization activities, samples were collected from caulking and from building materials adjacent to caulking in observance of proper sample collection techniques, analytical methods, and reporting procedures. This section provides a summary of the samples collected and the analytical results for those samples.

2.1 CHARACTERIZATION SAMPLE COLLECTION

A total of 33 samples were collected and analyzed for PCBs during two field events on August 13th and 14th, 2012. A breakdown of samples collected by media is provided below:

- Caulking Samples – 15 samples of caulking materials from the building exterior were collected and submitted for PCB analysis; and
- Adjacent Materials – 18 samples of brick were collected and submitted for PCB analysis from locations adjacent to caulking identified as containing ≥ 50 ppm PCBs.

Summaries of the characterization samples collected and analytical results are presented on Tables 2-1 and 2-2. The locations of the building material characterization samples collected are presented on Figures 2-1 through 2-3.

2.1.1 Sample Collection Methods

Caulking and sealant samples were collected by cutting and scraping the caulking from the joint with hand tools. If adjacent media (e.g., brick or a foam backer rod) was inadvertently removed in the process of sample collection, this media was physically removed from the caulking before the sample was placed in its sample container.

Building material sampling was conducted in accordance with the USEPA Region I Standard Operating Procedure for Sampling Porous Surfaces for PCBs (May 2011) using a hammer drill to a depth of 0.5 inches into the material at each sample location. Sample media was collected from surfaces by attaching a disposable trap beneath the sample location to gather the dust as it was generated.

Reusable sampling equipment was decontaminated between each location by scrubbing with a biodegradable soap and water solution (Alconox) followed by a water rinse and a final methanol rinse then allowed to air dry.

2.1.2 Laboratory Analysis

Samples were logged on standard chain of custody (COC) forms and stored on ice for delivery to Con-Test Analytical Laboratory of East Longmeadow, Massachusetts. All samples were extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

The complete laboratory analytical reports for the data presented in this plan are provided in Appendix B.

2.2 CHARACTERIZATION SAMPLE RESULTS

A summary of the characterization sample results by media and reported concentrations is presented in the following sections.

2.2.1 ≥ 50 ppm Caulking/Sealants

A summary of the materials reported to contain ≥ 50 ppm PCBs, based on the work areas in which they were identified, is presented on Table 2-1 and as follows:

- Parapet Wall Joints – caulking was identified on the building and penthouse parapet walls as follows:
    - Building and Penthouse Parapet Wall Cap Joints (approximately 1,000 l.f.): Two samples of caulking were collected from horizontal brick to aluminum cap joints on the building and penthouse parapet walls. Analytical results indicated that PCBs were present at concentrations of 45 and 193 ppm;
    - Vertical Control Joints (approximately 110 l.f.): Analytical results from the vertical control joint samples described below are considered representative of this material; and
    - Horizontal Control Joints (approximately 400 l.f.): Analytical results from horizontal control joint samples described below are considered representative of this material.
- Rooftop Unit (RTU) Enclosure caulking was identified at the RTU units as follows:
    - Cap to Cap Joints (64 joints; approximately 50 l.f.): One sample was collected from the capstone to capstone joints running laterally across the top of the RTU retaining walls. Analytical results indicated that PCBs were present at a concentration of 3,500 ppm; and
    - Cap to RTU Wall Joints (approximately 400 l.f.) One sample was collected from the capstone to brick joint located beneath the capstone. Analytical results indicate that PCBs were present at a concentration of 12,000 ppm.
- Building and Penthouse Control Joints
    - Vertical Control Joints (approximately 1,950 l.f.): Caulking associated with vertical control joints includes the following:
        - Building Control Joints (approximately 1,700 l.f.): Two samples of caulking were collected from exterior brick to brick vertical control joints. Analytical results indicated that PCBs were present at concentrations of 160,000 and 170,000 ppm;
        - Penthouse Wall Vertical Control Joints (approximately 150 l.f.): One sample of caulking was collected from brick to brick control joints on the mechanical room penthouse wall. Analytical results indicated that PCBs were present at a concentration of 150,000 ppm; and
        - Penthouse Access Door Vertical Joints (interior and exterior sides of 3 doors or approximately 100 l.f.): Two samples of caulking were collected from the interior and exterior masonry to metal joints surrounding the stairwell penthouse access doors on the east and west stairwell penthouses (2 doors). Analytical results indicated that PCBs were present at a concentration of 140,000 in both samples.
    - Horizontal Control Joints (approximately 5,750 l.f.): Caulking associated with horizontal control joints includes the following:
        - Building Control Joints (approximately 5,600 l.f.): Two samples of caulking were collected from exterior brick to brick horizontal control joints. Analytical results indicated that PCB concentrations of 110,000 and 150,000 ppm;

- Penthouse Wall Horizontal Control Joints (approximately 130 l.f.): One sample of caulking was collected from the brick to brick joints. Analytical results indicated that PCBs were present at a concentration of 53 ppm; and
- Penthouse Access Door Horizontal Joints (interior and exterior sides of 3 doors or approximately 20 l.f.): Analytical results from the vertical access door joint samples described above are considered representative of this material.

Analytical results described above are consistent with the characterization sampling results from the Brown and McNamara Residences.

2.2.2 < 50 ppm Caulking/Sealants

As indicated on Table 2-1, caulking identified as containing < 50 ppm PCBs has been identified in approximately 65 l.f. of joints associated with the mechanical room penthouse louvers, flashing anchor bolts, and lightning protection anchors and strapping. Analytical results from the three samples collected reported PCBs at concentrations of 13, 18, and 18.8 ppm. A review of maintenance records for the building and interviews with facility personnel indicated that no major renovations have been done to the Cashin building since construction and the caulking at these locations is believed to be original to the building.

Based on this information, UMass has determined that this caulking meets the definition of an Excluded PCB Product per 40 CFR 761.3. The project specifications prepared for the roof repair project will identify these specific materials as having detectable concentrations of PCBs at these levels for management and disposal purposes.

2.2.3 Adjacent Building Materials

A total of 18 samples of building materials adjacent to ≥ 50 ppm sealants were collected to determine the nature and extent of PCBs in these materials and to evaluate the preliminary site model, which was developed in part based on remedial activities at the Brown Residence in 2011 and the McNamara Residence in 2012. Additional details of the building material sampling, including analytical results, are included in subsequent sections of this plan. Summaries of the samples collected and the analytical results are included on Table 2-2. Locations of the building material characterization samples are presented on Figures 2-1 through 2-3.

2.3 DATA USABILITY ASSESSMENT

This data quality and data usability assessment has been conducted to review the 33 primary samples collected from the Cashin Residence as part of the characterization sampling events. Data validation and review was conducted both by Woodard & Curran and 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, laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) results; and an evaluation of sample holding times and field duplicate results. Data validation summaries are provided in Appendix B.

A summary of the data usability assessment is presented below:

- Samples were collected and transported to the laboratory for analysis under the standard chain of custody procedure. Some samples within sample delivery group 12H0464 were received at greater than the allowable temperature range; however, no qualifications have been applied because the samples were submitted to the laboratory immediately following collection;

- All primary samples analyzed for PCBs were extracted and analyzed within technical holding times. No qualifications were applied to the data for the primary samples. Equipment blank sample CR-CBBQ-020 was extracted beyond the seven day holding time limit. All non-detected results in sample CR-CBBQ-020 have been qualified as estimated (UJ);
- One equipment blank (field QA/QC) sample was collected and submitted to the laboratory as part of the field QA/QC procedure. The equipment blank sample was non-detect for all target analytes. No qualifications were applied (except as noted above);
- All PCB surrogates met acceptance criteria or were diluted out. No qualifications were applied;
- Some samples were analyzed at dilutions due to the high concentration of PCBs present in the samples and/or due to sample matrix. Elevated quantitation limits (laboratory reporting limits) are reported in these samples as a result of the dilutions performed;
- Results of the matrix spike/matrix spike duplicate (MS/MSD) samples met acceptance criteria. No qualifications were applied;
- Accuracy of the analytical data was assessed by reviewing the LCS/LCSD. The LCS/LCSD recoveries met acceptance criteria. No qualifications were applied;
- Relative percent difference (RPD) values between sample columns for detected Aroclors met acceptance with the exception of Aroclor 1260 results in sample CR-CK-011. Analytical results for Aroclor 1260 have in this sample have been qualified as estimated J;
- Two duplicate samples were collected and submitted to the laboratory as part of the field QA/QC procedures. The duplicate samples met acceptance criteria. No qualifications were applied;
- Representativeness of the data was evaluated qualitatively utilizing site use information and sampling data. Consistent procedures and laboratory analysis of the data were achieved. PCBs were not detected in the laboratory method blank analyses, indicating that there were no interferences introduced at the laboratory during sample analysis; and
- The data packages were reviewed to ensure that all sample and associated quality assurance results were available. The completeness review indicated that all samples were analyzed and all quality control results were available to complete the data validation process.

Based on a review of the collective data set, the data adequately represents the materials tested. The characterization data is of sufficient quality for the purposes of characterizing PCB-affected media in accordance with 40 CFR Part 761 and for use in developing the remediation plan presented herein.

3. REMEDIATION PLAN OVERVIEW

This Plan has been developed for the remediation of ≥ 50 ppm PCB-containing sealants and PCB-impacted building materials that will be disturbed during the upcoming building envelope repair project at the Cashin Residence. As was done at the Brown and McNamara Residences in 2011 and 2012, the building envelope project is comprised of repairs including the removal and replacement of caulking from exterior vertical and horizontal control joints and the removal of the building and penthouse parapet walls for the preparation of a new roof system. The remediation plan presented herein has been developed based on the site model developed for the Sylvan Residential Complex during the 2011 and 2012 remediation activities as presented in the PCB Remediation Plans submitted for these two other buildings.

The proposed remediation is a combination of removal and off-site disposal of PCB Bulk Product Waste under 40 CFR 761.62 (≥ 50 ppm PCB-containing sealants and adjacent building materials in direct contact/coated by sealants) and a risk-based cleanup and disposal in accordance with 40 CFR 761.61(c) for the in-place management of PCB-impacted building materials.

In summary, the following caulking sealants have been identified as PCB Bulk Product Waste (i.e., have been determined to contain ≥ 50 ppm PCBs) and will be removed and disposed off-site in accordance with 40 CFR 761.62:

- Parapet Wall Joints:
    - Building and Penthouse Parapet Wall Cap Joints – Approximately 1,000 l.f. of caulking located between the aluminum parapet wall cap and the outer brick wall of the parapets;
    - Vertical Control Joints – Approximately 110 l.f. of caulking in the vertical brick to brick parapet wall control joints; and
    - Horizontal Control Joints - Approximately 400 l.f. of caulking in the lower horizontal brick to brick building parapet wall control joints.
- RTU Enclosure Wall Joints
    - Cap to Cap Joints – Approximately 50 l.f. of caulking in the masonry to masonry joints along the top of the retaining walls surrounding the four roof top air handling units; and
    - Cap to RTU Wall Joints – Approximately 400 l.f. of caulking on the underside of the concrete capstone at the capstone to brick joints surrounding the four roof top air handling units.
- Building and Penthouse Control Joints:
    - Vertical Control Joints (approximately 1,950 l.f.):
        - Building Control Joints - Approximately 1,700 l.f. of caulking in vertical building wall brick to brick control joints;
        - Penthouse Wall Vertical Control Joints – Approximately 150 l.f. of caulking in the vertical penthouse wall brick to brick control joints; and
        - Penthouse Access Door Vertical Joints – Approximately 100 l.f. of caulking within the vertical portions of the metal to brick door joints on the interior and exterior sides of the three penthouse access doors.
    - Horizontal Control Joints (approximately 5,750 l.f.):

- Building Control Joints Approximately 5,600 l.f. of caulking in horizontal building wall brick to brick control joints;
- Penthouse Wall Horizontal Control Joints – Approximately 130 l.f. of caulking in horizontal penthouse wall brick to brick control joints; and
- Penthouse Access Door Horizontal Joints – Approximately 20 l.f. of caulking within the horizontal portions of the metal to brick door joints on the interior and exterior sides of the three penthouse access doors.

For the vertical and horizontal control joints, the ≥ 50 ppm PCB-containing caulking will be removed from the joints using hand tools. Upon the completion of caulking removal activities, the joints will be visually inspected for the presence of any residual caulking. If residual caulking is observed on building materials scheduled to remain, it will be removed from the adjacent material using hand tools or electric caulking removal tools to achieve caulking removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from caulking or adjacent materials. There will be no grinding or saw cutting of the caulking. Caulking associated with the parapet walls and RTU enclosure walls will be removed with the surrounding building materials as described in subsequent sections of this plan.

Building materials scheduled to be removed will be removed using mechanical methods (saw cutting, hand tools, chipping guns, jack-hammers etc.) as described in the following sections of this plan. In areas where building materials are scheduled for removal, a "cut-line" approach will be implemented, where the materials will be removed and disposed of as a single ≥ 50 ppm PCB Waste stream and verification sampling will be conducted to identify a cut-line between the PCB waste and materials to be disposed of as general construction and demolition debris (i.e., PCBs ≤ 1 ppm).

Building materials within the return of the joints and not scheduled for removal during the renovation/repair project (i.e., in former direct contact with the existing caulking) will be encapsulated using two coats of a liquid epoxy coating (e.g., Sikagard 62 liquid epoxy, Devcon 5 minute epoxy gel, or equivalent product) prior to the installation of the backer materials and replacement caulking.

Building materials away from the former joints (i.e., not within the return of the joint) and not scheduled for removal, and identified as containing PCBs at concentrations above the applicable clean up criteria, will be encapsulated using two coats of a liquid coating (Sikagard 670W acrylic coating, or equivalent product).

The rationale for the encapsulation approach is that the removal or scarification of these materials could result in structural damage to the building and result in significant schedule impacts which could prevent the completion of the project within the designated time frames (i.e., work is scheduled to commence immediately following graduation and needs to be completed prior to the beginning of the fall semester due to University housing constraints). Following application of the liquid encapsulant, verification wipe samples will be collected in accordance with the standard wipe test method as specified in 40 CFR 761.123.

The applicable clean up criteria for materials remaining on the building will be assigned as follows:

- Interior locations and locations ≤ 8' 8" above ground surfaces[1] – high occupancy clean up criteria of 1 ppm; and

[1] The 8' 8" distance above ground surfaces corresponds to approximately the top of the ground floor windows.

- Exterior locations > 8' 8" above ground surfaces (including roof top areas) – low occupancy clean up criteria of 25 ppm.

The use of the low occupancy clean up criteria at locations > 8' 8" above ground surfaces is based on the 40 CFR 761.3 definition of this type of occupancy and the low potential for direct contact with these materials. Windows on the building face are set back approximately 18 inches from the face of the building, minimizing the chance for direct contact of these materials through the windows (see photograph provided in Section 1). Also, there is no access to the exterior portions of the upper floors of the building via balconies, doors, or other access points. Due to the location of the penthouses on the roof of the building and the secured access to the roof top (the access door is kept locked at all times and is alarmed to alert UMass Residential Life Security if the door is opened), these areas are also considered to be low occupancy areas.

The in-place management of PCB remediation waste through encapsulation is an interim measure designed to shield impacted materials from the effects of weathering and leaching mechanisms, thereby eliminating potential exposure pathways and mitigating the potential for PCB transfer via direct contact and/or leaching to other media. Accordingly, there will be no resultant exposure to PCBs. The residual PCBs therefore will not present a risk to human health or the environment. The encapsulation and in-place management approach is described in further detail in the following sections of this Plan. Long-term maintenance and monitoring of those surfaces required to be encapsulated and a deed restriction will be implemented at the conclusion of remedial actions. This approach is considered an interim measure, and will require proper disposal of any remaining PCB remediation waste upon removal of the material or at the time of building demolition.

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 once the building repair projects have been completed at the buildings. 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 without impeding the building repair project. A plan for remediation activities will be submitted, as needed, following the assessment of ground surfaces.

Details of remedial activities for each of the materials containing PCBs ≥ 50 ppm are included in Sections 5 through 7. A summary of the remedial approach and verification sampling plan is presented on Table 3-1. The proposed extent of encapsulation surrounding horizontal and vertical control joints is depicted on Figure 3-1.

4. PREPARATION, COMMUNICATIONS, AND CONTROLS

Prior to initiating any of the remediation activities, the following activities will be implemented:

Preparation and Communications

- A Health & Safety Plan will be developed for the specific work activities to be conducted. Workers will follow applicable Federal and State regulations regarding the work activities, including but not limited to OSHA regulations, fall protection standards, respiratory protection, ladder/scaffolding safety, personal protective equipment (PPE), etc.

- Additional notifications and plans required for the work activities will also be prepared and submitted for approval, as needed.

- Prior to initiation and periodically during the work activities, project-related communications with University staff and contractors will be undertaken on an as needed basis. These communications may include schedule updates regarding disruption to particular areas, restrictions on building access, or significant project updates. It is anticipated that the majority of the work will be conducted when the students are not in the building. Additional communications will also be performed through the University's web site.

Controls

- Access to the active work areas will be restricted by fencing and signage with controlled access points.

- To reduce particulate levels and exposures to airborne particulates, a combination of engineering controls (e.g., work zone enclosures, wetting, etc.) and PPE will be implemented as part of the work activities.

- Remediation will be performed under engineering controls. Polyethylene sheeting will be placed around the work areas including on scaffolding and lifts used to access the work areas. Wet wiping and water misting will be used as a dust suppressant as appropriate. No grinding or saw cutting will be used for caulking removal.

- Dust monitoring will be conducted in accordance with Appendix C during active dust generating removal activities. Based on the engineering controls to be implemented and the minimal amount of disturbance to the caulking required for caulking removal, dust monitoring will not be conducted when only caulking and brick materials are being removed.

- Ground cover will be placed along the building walls to minimize the disturbance of the surrounding soils during erection of the scaffolding and the movement of aerial lifts (e.g., planking or similar) and to serve as containment for any debris or building materials that may fall during removal activities (e.g., polyethylene sheeting). Any debris collected within the polyethylene areas or on ground cover sheeting will be gathered and placed in the appropriate containers at the end of each work day. After use, disposable PPE and poly sheeting used to collect debris will placed in the appropriate containers for disposal as PCB remediation waste as described in Section 8.

- Wet wiping, spraying, and/or vacuuming of tools and equipment in the work area will be performed at the completion of the work activity. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79.

5. BUILDING AND PENTHOUSE PARAPET WALLS

Brick parapet walls are located at the top of the building and the three roof top penthouses. The parapets are constructed of brick and are approximately three feet (building parapet walls) or 18 inches (penthouse parapet walls) high. An aluminum cap is located at the top of each parapet wall. A caulked joint, identified as the parapet wall cap joint, is located along the brick to aluminum joint at the top of the wall. A horizontal control joint is located along portions of the bottom of the building parapet wall and vertical control joints are present at some of the 90-degree corners of the building parapet wall (vertical control joints are extensions of the vertical building wall control joints).

The existing building envelope and roof repair project scope includes the complete removal of the building and penthouse parapet walls to allow for the installation of the new roof system.

5.1 CHARACTERIZATION

Characterization samples of caulking and building materials were collected from the building and penthouse parapet walls. Analytical results from caulking samples of the parapet wall cap joints indicated that PCBs were present in the caulking at concentrations ≥ 50 ppm. Results of characterization samples of caulking from vertical and horizontal control joints on the building and penthouse façade were used to characterize caulking associated with vertical and horizontal parapet wall control joints as ≥ 50 ppm.

Additionally, three samples of brick materials below the penthouse parapet wall cap joints were collected from the first row of horizontal brick below the vertically aligned soldier bricks to confirm that the waste segregation cut-line established for the Brown and McNamara Residences would be appropriate for parapet walls on the Cashin Residence. Analytical results indicated that PCBs were non-detect (< 0.091 ppm) in all three samples collected. Results from the characterization sampling were consistent with those obtained during sampling at the Brown Residence in 2011 and the sampling at McNamara Residence in 2012. Building material samples of brick along the vertical parapet wall joints, the lower horizontal parapet wall joint, and the building parapet wall cap joints were not collected due to access limitations (these locations are located at the top of the building with no access from the roof).

Summaries of the caulking and building material characterization sampling results are presented on Table 2-1 and Table 2-2, respectively. The locations of the building material samples are presented on Figures 2-1 through 2-3.

5.2 REMEDIATION

The remedial approach for the building and penthouse parapet wall caulking and adjacent materials is described below. This approach is a basic cut-line removal approach, where the caulking and adjacent materials will be removed and disposed of as PCB Bulk Product Waste and verification sampling will be conducted to identify a cut-line between PCB Bulk Product Waste and materials to be disposed of as general construction and demolition debris (i.e., PCBs ≤ 1 ppm).

≥ 50 ppm PCB containing caulking – Caulking associated with the parapet wall cap joints (1,000 l.f.), the horizontal parapet wall control joints (400 l.f.), and the vertical parapet wall control joints (110 l.f.) has been identified as containing ≥ 50 ppm PCBs. All caulking associated with the penthouse parapet walls will be removed and disposed of as PCB bulk product waste in accordance with 40 CFR 761.62.

Parapet wall materials – Adjacent building materials in direct contact/attached to sealants will be removed for disposal as PCB Bulk Product Waste as follows:

- Aluminum cap and associated materials;

- The first course of brick materials below the parapet cap joints (vertically aligned soldier bricks);
- The first course of brick materials above the horizontal parapet wall control joints; and
- Brick materials within eight inches of the vertical parapet wall control joints (one full row of bricks).

Remaining brick materials and other parapet wall materials will be removed and segregated for disposal as general demolition debris pending the results of verification sampling, as described below.

5.3 BUILDING MATERIAL VERIFICATION SAMPLING

Prior to removal of any ≥ 50 ppm PCB waste from the parapet walls, verification samples will be collected from parapet wall brick materials to verify the extent of PCBs > 1 ppm as follows:

- Below the Parapet Wall Cap Joints – Verification samples will be collected from the first row of horizontal bricks below the vertically aligned soldier bricks (a distance of approximately 4.5 inches below the joint) at a frequency of one sample per 50 l.f. Based on a total of 1,000 l.f. of joint, a total of 20 samples will be collected (including the three samples already collected);
- Above the Horizontal Parapet Wall Control Joints – Verification samples will be collected from the second row of horizontal bricks above the joint (a distance of approximately three inches above the joint) at a frequency of one sample per 50 l.f. Based on a total of 400 l.f. (horizontal control joints are only present on portions of the building parapet wall), a total of 8 samples will be collected; and
- Away from Vertical Parapet Wall Control Joints – Verification samples will be collected from the beginning of the second full row of bricks away from the joint (a distance of approximately eight inches from the joint) at a frequency of one sample per building elevation for a total of 4 samples. Samples will be divided between the interior and exterior vertical joints (i.e., those joints on the roof top side of the parapet wall and those joints on the "outward" side of the parapet walls).

Analytical results from the verification samples will be compared to the unrestricted use criteria of 1 ppm for waste segregation purposes. If results indicate that PCBs are present at concentrations > 1 ppm, additional verification samples will be collected at distances further from the respective joints to delineate the extent of PCBs > 1 ppm. Bricks located up to the sample with ≤ 1 ppm PCBs, in either direction, will be segregated for off-site disposal as ≥ 50 ppm PCB waste. All other bricks/materials will be segregated for off-site disposal as general construction and demolition debris.

The encapsulation of brick materials below the horizontal parapet wall control joints, building façade not scheduled to be removed, is described in Section 7 below.

6. ROOFTOP ENCLOSURES

Brick enclosure walls are located on the roof top area surrounding the four air handling units. Each of the four enclosures consists of a 3 ½ foot high brick wall with a masonry cap (see photo at right). A total of 64 caulked joints each less than one foot in length, oriented perpendicular to the brick, are present between the pre-cast concrete cap blocks. Additionally, a caulked joint is present between the masonry cap and the RTU walls.

The existing building envelope and roof repair project scope includes the complete removal of the RTU enclosures in support of the roof replacement activities.

Rooftop Enclosure Wall

6.1 CHARACTERIZATION

To confirm the site model, one sample of caulking from each type of joint was collected from the RTU retaining walls. Analytical results indicated that PCBs were present at a concentration of 3,500 ppm in the masonry cap joints and at a concentration of 12,000 ppm in the masonry cap to RTU wall joints.

Four characterization samples of the RTU brick wall materials (one per RTU enclosure) were collected from the second row of brick below the caulked joint located along the underside of the individual capstones to establish the waste segregation cut-line. Analytical results indicated that PCBs were non-detect (one sample at < 0.095 ppm) or present at concentrations < 1 ppm PCBs (three samples at 0.14, 0.2 and 0.2 ppm).

Summaries of the caulking and building material characterization sample results are presented on Table 2-1 and Table 2-2, respectively. The locations of the building material characterization sample results are presented on Figure 2-3.

6.2 REMEDIATION

The remedial approach for the RTU enclosure wall caulking and adjacent materials is described below. This approach is a basic cut-line removal approach, where the caulking and adjacent materials will be removed and disposed of as PCB Bulk Product Waste and verification sampling will be conducted to identify a cut-line between PCB Bulk Product Waste and materials to be disposed of as general construction and demolition debris (i.e., PCBs ≤ 1 ppm).

≥ 50 ppm PCB containing caulking – Caulking associated with enclosure wall masonry cap joints (50 l.f.) and RTU cap to wall joints (400 l.f.) has been identified as ≥ 50 ppm PCB-containing caulking. All caulking associated with the RTU enclosure walls will be removed and disposed of as PCB bulk product waste in accordance with 40 CFR 761.62.

RTU Enclosure wall materials – Adjacent building materials in direct contact/attached to sealants will be removed for disposal as PCB Bulk Product Waste as follows:

- Pre-cast concrete cap and backing materials; and
- The first horizontal course of brick beneath the capstone.

Remaining RTU enclosure wall materials will be removed and segregated for disposal as general demolition debris pending the results of verification sampling, as described below.

6.3 BUILDING MATERIAL VERIFICATION SAMPLING

Prior to removal of any ≥ 50 ppm PCB waste, verification samples will be collected from the second row of horizontal bricks below the masonry cap to RTU wall joints to verify the extent of PCBs > 1 ppm. Samples will be collected at a frequency of one sample per 50 l.f. of joint. Based on a total of 400 l.f., eight samples will be collected (including the four samples already collected).

Analytical results from the verification samples will be compared to the unrestricted use criteria of 1 ppm for waste segregation purposes. If results indicate that PCBs are present at concentrations > 1 ppm, additional verification samples will be collected at distances further from the joints to delineate the extent of PCBs > 1 ppm. RTU enclosure wall materials located up to the sample with ≤ 1 ppm PCBs, in either direction, will be segregated for off-site disposal as ≥ 50 ppm PCB waste. All other materials will be segregated for off-site disposal as general construction and demolition debris.

7. HORIZONTAL AND VERTICAL CONTROL JOINTS

Horizontal and vertical control joints are located throughout the exterior brick façade of the Cashin Residence (building and penthouse walls). Based on the similar reported PCB concentrations and the proposed remedial actions for the materials associated with the joints at the Brown and McNamara Residences, characterization and remedial activities associated with this building's facade control joints, penthouse wall control joints, and stairwell penthouse access door joints are described in this section. These joints will be collectively referred to as "control joints" for the purposes of this plan.

The existing building envelope and roof repair project scope includes the removal and replacement of existing caulking and backing materials from the control joints and limited brick repair, as needed.

7.1 CHARACTERIZATION

To confirm the site model for the Sylvan Residential Complex, which includes the presence of ≥ 50 ppm PCB-containing caulking in horizontal and vertical control joints, a total of eight caulking characterization samples were collected from the horizontal and vertical control joints on the building façade, the penthouse façade, and the penthouse access doors (interior and exterior joints). Analytical results indicate that the caulking within the control joints contains ≥ 50 ppm PCBs in all eight samples (total PCBs ranged from 53 to 170,000 ppm).

Building material characterization samples were collected from building materials away from vertical control joints and above and below horizontal control joints to evaluate if the extent of PCBs > 1 ppm was consistent with that observed at the Brown and McNamara Residences during the remediation activities conducted in 2011 and 2012.

Samples were collected from locations on the north and south building elevations at heights above and below 8' 8" above ground surface. A summary of sample locations and analytical results is as follows:

- Vertical Control Joints – Samples of brick materials were collected at a distance of eight inches from the vertical control joints (one full brick width) at one location within the high occupancy areas (i.e., < 8' 8" above ground surface) and two locations within the low occupancy areas (i.e., > 8' 8" above ground surface) to evaluate the extent of PCBs in brick materials away from the joint. Analytical results indicated that PCBs were non-detect in two of the samples collected (< 0.091 ppm) and present at a concentration of 0.42 ppm in the third sample;
- Horizontal Control Joints – Samples of brick materials were collected above and below horizontal control joints at two locations within the high occupancy areas and two locations within the low occupancy areas. A summary of the samples collected is as follows:
    - High Occupancy Areas (≤ 8' 8" above ground surface) – Two samples were collected at a distance of 3 inches above the caulked joint (the second row of brick above the joint). Analytical results indicated that PCBs were non-detect (< 0.087 ppm) in one of the samples collected and present at a concentration of 0.26 ppm in the second sample. Two samples were collected at a distance of eight inches below the caulked joint (the bottom of the third brick below the joint). Analytical results indicated that PCBs were non-detect in both samples (< 0.087 ppm and < 0.091 ppm); and
    - Low Occupancy Areas (> 8' 8" above ground surface) – Sample were collected at a distance of 0.5 to 1.0 inches above and below the caulked joint to evaluate the concentration of PCBs immediately away from the joint. Analytical results indicated that PCBs were either non-detect (< 0.095 ppm in one sample above and one sample below the joint) or present at concentrations of 0.12 ppm above the joint and 0.18 ppm below the joint.

Summaries of the caulking and building material characterization sample results are presented on Table 2-1 and Table 2-2, respectively. The locations of the building material characterization sample results are presented on Figures 2-1 and 2-2. Overall, the results from the Cashin Residence characterization sampling were consistent with those obtained during characterization of the Brown and McNamara Residences.

7.2 REMEDIATION

The remedial approach for the control joint caulking and adjacent materials is described below. The approach consists of managing any caulking or building material removed during the repair project as ≥ 50 ppm PCB waste. Adjacent façade brick not scheduled for removal will be managed in-place through encapsulation of those areas in excess of applicable cleanup levels.

7.2.1 Removal and Disposal

≥ 50 ppm PCB containing caulking – Caulking associated with the horizontal and vertical control joints (including building and penthouse wall joints and stairwell penthouse access door joints) has been identified as ≥ 50 ppm PCB-containing caulking. All caulking associated with these joints will be removed and disposed of as PCB bulk product waste in accordance with 40 CFR 761.62.

Building Materials – Building material removal along horizontal and vertical control joints will be performed as needed to complete limited repair and replacement activities of damaged or deteriorating brick (including materials impacted by verification testing). Any brick materials in direct contact/attached to sealants will be removed for disposal as PCB Bulk Product Waste including the first row of brick away from the vertical control joints (approximately 8 inches) and the first row of brick above and the first three rows of brick below the horizontal control joints.

Remaining materials with PCBs over the applicable cleanup level will be encapsulated based on the results of verification sampling, as described below.

7.2.2 Encapsulation and Verification – Former Direct Contact Areas

For the purposes of this project, building materials formerly in direct contact with ≥ 50 ppm PCB caulking and scheduled to remain in place will be assumed to contain PCBs at concentrations above the applicable use criteria as described in Section 3. As such, no direct contact baseline samples of the underlying masonry materials are proposed to be collected following removal of the source materials.

Following caulking removal, materials within the return of the joint (i.e., formerly in direct contact with the caulking) will be encapsulated using a liquid epoxy coating (Sikagard 62 epoxy, Devcon 5 minute epoxy gel, or equivalent product). If the Sikagard 62 liquid epoxy or a product with a similar application (i.e., two part liquid epoxy applied with a brush) is selected, two coats of the product will be required at all locations. If the Devcon 5 minute epoxy gel or similar product is selected, one thick coat of the gel will be applied per the specification. Product information for the Sikagard 62 liquid epoxy and the Devcon 5 minute epoxy gel is provided in Appendix D.

Following application and an appropriate cure time, inspection and verification wipe testing will be conducted. Visual inspection will be conducted to confirm that the application has been conducted in accordance with the manufacturer's specifications to the extent required. Verification wipe samples will be collected in accordance with 40 CFR 761.123 modified due to the narrow construction of the control joints (hexane saturated wipes will be folded and grasped with tweezers or a hexane saturated cotton swab will be used). All samples will be transported to the laboratory under standard Chain of Custody procedures, extracted using USEPA Method 3540C (Soxhlet extraction), and analyzed for PCBs using USEPA Method 8082.

The verification wipe samples will be collected from the encapsulated surfaces in high and low occupancy areas at a frequency of one sample per 200 l.f. of joint for a total of 41 samples. Of these, a minimum of one will be collected from the penthouse wall joints and one will be collected from the stairwell penthouse access door joints.

Analytical results from the verification samples will be compared to the encapsulation target of ≤ 1 µg/100cm^2 as follows:

- Total PCBs ≤ 1 µg/100cm^2 – No additional action, replacement caulking installed as per existing project scope, materials included in long term maintenance and monitoring plan; and

- Total PCBs > 1 µg/100cm^2 – Depending on concentration and project schedule, additional coating of liquid epoxy may be applied within the inner return of the joint in both directions to the next sample point below 1 µg/100cm^2. Follow up verification wipe sample collected at an off-set location.

A summary of the proposed encapsulation and verification sampling activities is presented on Table 3-1.

7.2.3 Encapsulation and Verification – Areas Away From The Caulked Joints

As discussed above, adjacent façade brick not scheduled for removal will be managed in-place through encapsulation of those areas in excess of applicable cleanup levels. Prior to encapsulation, the extent of PCBs above the applicable use criteria and the areas for the encapsulating coatings will be determined by collecting verification samples from the brick materials away from the control joints (non-direct contact areas).

Following completion of all other PCB remediation activities, building materials will be encapsulated using two coats of a clear acrylic coating (Sikagard 670W, or equivalent product). Product information for the Sikagard 670W is provided in Appendix D. Inspection and verification wipe testing will be conducted following application of the liquid coating. Visual inspection will be conducted to confirm that the application has been conducted in accordance with the manufacturer's specifications to the extent required.

Following demobilatization of the work crews, verification wipe samples will be collected in accordance with 40 CFR 761.123 (to be collected during the Thanksgiving break as has been done for the Brown and McNamara Residences previously). All samples will be transported to the laboratory under standard Chain of Custody procedures, extracted using USEPA Method 3540C (Soxhlet extraction), and analyzed for PCBs using USEPA Method 8082.

A summary of the proposed encapsulation and verification sampling activities is presented on Table 3-1. The extent of the proposed encapsulation surrounding horizontal and vertical control joints is depicted on Figure 3-1. The extent of the liquid coatings specified below may be modified based on the overall project specifications.

A summary of the encapsulation and verification for the two different types of joints is presented in the following sections.

7.2.3.1 Vertical Joints

Building materials away from the joints and identified as containing PCBs at concentrations above the high or low occupancy criteria will be managed in place through the application of two coats of a clear, liquid coating (Sikagard 670W or equivalent product). Based on the data collected from the Brown and McNamara Residences and the limited sampling conducted at the Cashin Residence (as described above), the initial extent of encapsulation on bricks adjacent to vertical joints will be to a distance of eight inches (i.e., to the first row of brick away from vertical control joints) on both sides of the joint along the joint full height of the building.

Prior to application of the liquid coating, verification bulk samples of brick to determine if additional areas will require encapsulation will be collected at a distance of eight inches from the caulked joint (i.e., the beginning of the second full row of brick from the caulked joint) at the following frequency:

- High Occupancy Use Areas (≤ 8' 8" above ground surface) – Verification samples will be collected at a frequency of one sample per 50 l.f. of caulked joint for a total of six samples (including the sample already collected) based on approximately 300 l.f. of joints; and
- Low Occupancy Use Areas (> 8' 8" above ground surface) – Verification samples will be collected at a frequency of one sample per 200 l.f. of caulked joint for a total of nine samples (including the sample already collected) based on a total of approximately 1,650 l.f. of vertical joints (1,400 l.f. of vertical building wall control joints, 150 l.f. of vertical penthouse wall control joints, and 100 l.f. of vertical stairwell penthouse access door joints).

Results of the building material verification sampling will be compared to the high or low occupancy clean up criteria to verify the extent of encapsulation as follows:

- Total PCBs ≤ 1 ppm (high occupancy area) or ≤ 25 ppm (low occupancy areas), as applicable – No further action; and
- Total PCBs > 1 ppm or > 25 ppm, as applicable – Additional verification samples may be collected to determine the extent of PCBs, application of liquid coating may be extended based on overall data set.

Following application of the liquid encapsulant and curing, verification wipe samples will be collected to confirm that PCBs have been encapsulated. Verification wipe samples will be collected in high and low occupancy areas as follows:

- High Occupancy Areas (≤ 8' 8" above ground surface) – Verification wipe samples will be collected at a frequency of one sample per 50 l.f. of joint for a total of six samples (based on a total of 300 l.f.); and
- Low Occupancy Areas (>8' 8" above ground surface) – Verification wipe samples will be collected at a frequency of one sample per 200 l.f. of joint for a total of nine samples (based on a total of 1,650 l.f.). A minimum of two of the samples collected will be collected from the penthouse wall control joints or the stairwell penthouse access door joints;

Analytical results from the verification samples will be compared to the encapsulation target of ≤ 1 µg/100cm^2 as follows:

- Total PCBs ≤ 1 µg/100cm^2 – No additional action, materials included in long term maintenance and monitoring plan; and
- Total PCBs > 1 µg/100cm^2 – Depending on the concentration, additional coating of liquid encapsulant may applied to materials in both directions to the next sample point. Follow up verification wipe sample collected at an off-set location, as applicable or continued monitoring in the long term maintenance and monitoring program.

7.2.3.2 Horizontal Joints

Building materials away from the joints and identified as containing PCBs at concentrations above the high or low occupancy criteria will be managed in place through the application of two coats of a clear, liquid coating (Sikagard 670W or equivalent product). Based on the data collected from the Brown and McNamara Residences and the limited sampling conducted at the Cashin Residence (as described above), the initial extent of encapsulation on

bricks adjacent to horizontal joints will be the first row of bricks above the joint and the first three rows of brick below the joint for all horizontal joints in high occupancy areas (< 8' 8" above ground surface).

As described in detail in the November 2011 Brown Residence Remediation Plan Addendum and the March 2012 McNamara Residence PCB Remediation Plan, no encapsulating coatings are proposed for bricks away from the caulked joint in low occupancy areas (> 8' 8" above ground surface). As conducted at the Brown and McNamara Residences, verification samples will be collected in these areas from a 0.5 to 1 inch distance from the joint in order to evaluate potential "worst-case" areas with regard to PCB presence away from the caulked joints (immediately adjacent to the joint).

The data collected from the horizontal joints at the Brown and McNamara Residences indicated that no representative samples reported PCBs at concentrations > 25 ppm at various distances from the joint; thereby, meeting the low occupancy criteria (one sample at Brown and two samples at McNamara did contain PCBs > 25 ppm; however these samples were collected prior to removal of the caulking and are not considered representative of conditions following completion of the project).

As previously communicated, another consideration evaluated was the aesthetics of applying a coating to the horizontal joints throughout the buildings at the Sylvan Residential Complex. Although the Sika 670W is a "clear coat", when applied to brick facades 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 buildings. The visibility of the Sika 670W on the vertical joints is not as apparent given their location and position on the building.

As proposed in the Brown and McNamara Residences submittals, given the conditions described above, it is proposed that the goal will be that no additional encapsulation be applied to areas adjacent to the horizontal joints in areas greater than 8' 8" above ground surface.

Prior to application of the liquid coating, verification bulk samples of brick to determine if additional areas will require encapsulation will be collected from brick materials above and below the horizontal control joints as follows:

- High Occupancy Use Areas (≤ 8' 8" above ground surface) – A total of eight samples will be collected from four sample locations for a sample frequency of one sample set per building elevation (including those samples already collected). Samples will be collected as follows:
    - Above the Joint – Verification samples will be collected from the second row of brick above the caulked joint (approximately 3 inches above the joint); and
    - Below the Joint – Verification samples will be collected from the bottom of the third row of brick below the caulked joint (approximately eight inches below the joint).
- Low Occupancy Use Areas (> 8' 8" above ground surface) – Verification samples will be collected from materials at a distance of 0.5 to 1.0 inches from the joint. Samples will be collected from alternating locations above and below the joint at a frequency of one sample per 200 l.f. of caulked joint for a total of 27 samples (including the samples already collected) based on a total of 5,250 l.f. of horizontal joints. The rationale for the 0.5 to 1 inch distance from the joint is to collect samples from potential "worst-case" areas with regard to PCB presence from the caulked joints (immediately adjacent to the joint) – see previous discussion on rationale for coatings in low occupancy areas.

Results of the building material verification sampling will be compared to the high or low occupancy clean up criteria to verify the extent of encapsulation as follows:

- Total PCBs ≤ 1 ppm (high occupancy area) or ≤ 25 ppm (low occupancy areas), as applicable – No further action; and

- Total PCBs > 1 ppm or > 25 ppm, as applicable – Additional verification samples may be collected to determine the extent of PCBs, application of liquid coating may be extended based on overall data set.

Following application of the liquid encapsulant and curing, verification wipe samples will be collected to confirm that PCBs have been encapsulated. Verification wipe samples will be collected in high occupancy areas at a frequency of one sample per 50 l.f. of joint in high occupancy areas for a total of ten samples (based on a total of 500 l.f.).

Analytical results from the verification samples will be compared to the encapsulation target of ≤ 1 µg/100cm^2 as follows:

- Total PCBs ≤ 1 µg/100cm^2 – No additional action, materials included in long term maintenance and monitoring plan; and

- Total PCBs > 1 µg/100cm^2 – Depending on the concentration, additional coating of liquid encapsulant may applied to materials in both directions to the next sample point. Follow up verification wipe sample collected at an off-set location, as applicable or continued monitoring in the long term maintenance and monitoring program.

8. WASTE STORAGE AND DISPOSAL

Caulking containing ≥ 50 ppm PCBs and building materials in contact/attached to these sealants are to be managed for disposal as PCB Bulk Product Waste. Building materials containing PCBs at concentrations > 1 ppm removed from the building during this project will be managed with the caulking as a single waste stream and designated as ≥ 50 ppm PCB wastes and a State of Massachusetts Hazardous Waste (MA02) for the purposes of disposal. Polyethylene sheeting, PPE, and other disposable equipment and tools will be managed for disposal as < 50 ppm PCB wastes.

The following activities will be completed with regard to the proper storage and disposal of PCB wastes:

- Secure, lined, and covered waste containers (roll-off containers or equivalent), 55-gallon DOT-approved steel containers, or cubic yard boxes/totes will be staged for the collection of PCB wastes generated during the work activities in accordance with 40 CFR 761.65.

- Containers will be properly labeled and marked in accordance with 40 CFR 761.40 and stored within the construction fencing boundary in a location pre-approved by UMass.

- Upon completion of the work or when a container is considered full, ≥ 50 ppm PCB waste will be transported off-site under manifest, for disposal at a hazardous waste disposal facility (e.g., Environmental Quality's Wayne Disposal Facility located in Belleville, Michigan, or equivalent facility). Polyethylene sheeting, PPE, and other disposal equipment and tools will be transported off-site for disposal as < 50 ppm PCB waste to Waste Management's Turnkey Recycling and Environmental Enterprises (TREE) facility in Rochester, New Hampshire, or equivalent facility permitted to accept this type of waste.

- At the end of their use on the project, non-disposable tools and equipment will be decontaminated in accordance with 40 CFR 761.79. Decontamination fluids generated during the work will be collected/contained and managed/disposed in accordance with 40 CFR 761.79.

- Copies of the waste shipment records, including manifests and certificates of disposal, will be collected and provided as part of the final report to EPA.

9. CONCEPTUAL MONITORING AND MAINTENANCE PLAN

As described in this Plan, conditions exist on the project site that require implementation of an alternate remedial approach under 40 CFR 761.61(c). This approach removes source materials and utilizes a physical barrier approach (liquid coating in joints and on façades) to eliminate the direct contact exposure pathway and migration pathways of PCBs remaining on the building. Upon completion of the remedial actions, the impacted material would not be accessible for direct exposure or migration to surrounding building materials.

As previously communicated, long term monitoring and maintenance of PCB-impacted building materials to remain in place will be incorporated into a single plan for the entire Sylvan Residential Complex. The main components of the maintenance and monitoring plan (MMP) will be as follows:

- Visual inspections – Visual inspections of the encapsulated surfaces will be conducted. All inspections will be recorded and included in a report to the EPA. The inspections will consist of an assessment of the following:
    - Condition of the liquid coating including excessive pitting, peeling, or breakages in the coating; and
    - Signs of weathering or disturbance of the replacement caulking (where applied).
- Monitoring – Materials included in the long term monitoring will be monitored through the collection of verification wipe samples. Depending on the results of the baseline wipe testing, modifications to this approach may be needed.
- Corrective Actions – If results of the inspections indicate that damage has occurred to the encapsulant, the needed repairs will be conducted.
- Training and Guidelines – It is not anticipated that any workers or building occupants will come into prolonged or routine contact with the encapsulated surfaces given that they are located on exterior vertical building surfaces, where typical contact with the surfaces is expected to be incidental. It is not anticipated that workers or occupants would require any special training or need to take extra precautions due to the presence of the encapsulants on the building surfaces; however, UMass Environmental Health, & Safety (EHS) will conduct training for maintenance or other facility personnel that may work on the building and may impact the building coatings or barriers to communicate the locations and purpose of the encapsulants. Any non-routine projects that involve disturbance of building materials will be reviewed by EHS prior to initiation. If a planned project has the potential to disturb any encapsulated surfaces, relevant and appropriate worker training requirements and procedures specific to the task will be developed and implemented. Any such activities will be reported to EPA in the MMP report.
- Communications and Reporting – A report documenting the findings of the visual inspections will be prepared and submitted to EPA and used by UMass EHS to communicate any relevant findings to the appropriate campus personnel.

The details of the MMP will be developed following completion of the remediation activities. The results of the verification testing, baseline sampling, and inspections will be used to develop the details of the plan. The MMP will be provided to EPA under a separate submittal following the completion of the remedial activities.

10. PROJECT SCHEDULE AND RESTORATION

The planned building envelope repair and renovation project is scheduled to initiate immediately following graduation (spring 2013) and will be completed prior to students returning for the 2013 fall semester (i.e., May to August 2013). This schedule will allow for the renovation activities to be conducted when the building is vacant.

Following completion of the removal activities and verification that the cleanup levels have been met or the risk-based encapsulation approach applied, the building surfaces will be restored in accordance with the proposed building renovation projects. The site controls will be dismantled and all wastes will be transported off-site for proper disposal.

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 once the building repair projects have been completed at the buildings. 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 without impeding the building repair project. A plan for remediation activities will be submitted, as needed, following the assessment of ground surfaces.

11. RECORDKEEPING AND DOCUMENTATION

Following completion of the work activities, records and documents per 40 CFR Part 761 will be generated and maintained at one location. A final report documenting the completion of the work activities, verification analytical results, volumes of disposed materials, and waste disposal records will be prepared and submitted to EPA. This report will also include any necessary deed notices, if required, as part of the risk-based approach.

Table 2-1
Summary of Sealant Characterization Sampling Results

Cashin Residence
UMass Amherst

Location Description	Sealant Description	Sample ID	Sample Date	Aroclor 1254 (ppm)	Aroclor 1260 (ppm)	Total PCBs (ppm)
Building Façade Horizontal Control Joints						
South elevation, west of main entrance	1/2" wide, cream/light tan, smooth, flexible	CR-CK-013	8/13/2012	110,000	< 9,500	110,000
North elevation, above loading dock	1/2" wide, cream/light tan, smooth, flexible	CR-CK-014	8/14/2012	150,000	< 9,400	150,000
Building Façade Vertical Control Joints						
North elevation, west of loading dock	1/2" wide, cream/light tan, flexible, smooth	CR-CK-012	8/13/2012	160,000	< 9,400	160,000
North elevation, above loading dock	1/2" wide, cream/light tan, smooth, flexible	CR-CK-015	8/14/2012	170,000	< 8,500	170,000
Parapet Wall Cap Joints						
Building parapet wall, north elevation, between RTU 1 and RTU 2	1/4-1/2" wide, light cream/off-white, flexible, soft, sticky, chalky appearance on surface	CR-CK-007	8/13/2012	45	< 9.0	45
Penthouse Parapet wall, north face of east penthouse	1/2" wide, cream/off-white, flexible, smooth	CR-CK-011	8/13/2012	100	93 J	193 J
Penthouse Wall Joints						
Horizontal control joint, south side of mechanical room penthouse	1/2" wide, off-white, weathered, cracked surface	CR-CK-004	8/13/2012	53	< 20	53
Vertical control joint, west wall of mechanical room penthouse, north side of RTU	1/2" wide, cream/light tan, flexible, smooth	CR-CK-003	8/13/2012	150,000	< 9,800	150,000
Caulking at exterior side of door at west penthouse	1/4-3/4" wide(outer layer), weathered, yellow, highly flexible, slightly crystalline, 1/4-3/4" wide(inner layer), black, flexible,	CR-CK-006	8/13/2012	< 9,500	140,000	140,000
Caulking at interior side of door at west penthouse	1/2-3/4" wide, black, rubbery, flexible,	CR-CK-010	8/13/2012	< 8,300	140,000	140,000

Table 2-1
Summary of Sealant Characterization Sampling Results

Cashin Residence
UMass Amherst

Location Description	Sealant Description	Sample ID	Sample Date	Aroclor 1254 (ppm)	Aroclor 1260 (ppm)	Total PCBs (ppm)
RTU Enclosure Wall Joints						
Caulking between individual capstones at top of RTU enclosure	3/4" wide, gray top layer over cream/white	CR-CK-001	8/13/2012	3,500	< 200	3,500
East side of RTU 3	1/2" wide, beige/light tan	CR-CK-002	8/13/2012	12,000	< 480	12,000
Other Roof Area Sealants						
Large louver west side of mechanical room penthouse	1/4-1/2" wide, black, tacky, flexible, intermixed with repair sealant	CR-CK-005	8/13/2012	9.1	9.7	18.8
Caulking around flashing bolt holes	1/8" thick, gray/off-white, chalky texture on surface	CR-CK-008	8/13/2012	18	< 3.7	18
Caulking at lightning protection anchors and strapping	1/8" thick, gray/off-white, chalky texture on surface	CR-CK-009	8/13/2012	13	< 3.5	13

Notes:
1. Samples were sent to ConTest Analytical Laboratory in East Longmeadow, Mass for soxhlet extraction(3540C) and analyzed for PCBs by EPA Method 8082.
2. Total PCBs reported as Aroclor 1254 and Aroclor 1260. No other Aroclors reported at concentrations above the minimum laboratory reporting limits.
J = Value is qualified as estimated based on the relative percent difference between the sample column results outside the acceptance criteria.

Table 2-2
Summary of Building Material Characterization Sampling Results

Cashin Residence
UMass Amherst

Building Materials	Category	Sample Location	Sample Date	Sample ID	Total PCBs (ppm)
Horizontal Control Joint					
Brick to Brick	High Occupancy	Second row of brick above joint	8/13/2012	CR-CBB-031	**0.26**
			8/13/2012	CR-CBB-033	< 0.087
		Fourth row of brick below joint	8/13/2012	CR-CBB-030	< 0.091
			8/13/2012	CR-CBB-032	< 0.087
	Low Occupancy	0.5-1.0" above joint	8/14/2012	CR-CBB-034	< 0.095
			8/14/2012	CR-CBB-038	**0.12**
		0.5-1.0" below joint	8/14/2012	CR-CBB-035	< 0.095
			8/14/2012	CR-CBB-037	**0.18**
Vertical Control Joint					
Brick to Brick	High Occupancy	Second brick from joint	8/13/2012	CR-CBB-029	< 0.087
	Low Occupancy		8/14/2012	CR-CBB-036	< 0.091
			8/13/2012	CR-CBB-028	**0.42**
Parapet Wall					
Brick to Brick	Low Occupancy	First row of horizontal brick below soldier brick below joint	8/13/2012	CR-CBB-025	< 0.091
			8/13/2012	CR-CBB-026	< 0.091
			8/13/2012	CR-CBB-027	< 0.091
RTU Walls					
Capstone to Brick	Low Occupancy	Second row of brick below joint	8/13/2012	CR-CBB-021	**0.2**
			8/13/2012	CR-CBB-022	< 0.095
			8/13/2012	CR-CBB-023	**0.2**
			8/13/2012	CR-CBB-024	**0.14**

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

Table 3-1
Summary of Proposed Remedial Approach

Cashin Residence
UMass Amherst

Work Area	Remedial Approach	Verification Sampling Strategy	
		Sample Frequency	Number of Samples [1]
Parapet Walls	Parapet walls scheduled for removal as part of roof replacement project. Removal of materials to be conducted as follows: Caulking, mortar, and backing material removed for disposal as ≥ 50 ppm PCB waste. Aluminum cap and associated materials to be removed for disposal as ≥ 50 ppm PCB waste. Brick materials attached or in direct contact with caulking to be removed for off-site disposal as ≥ 50 ppm PCB waste as follows: Below Cap Joints (1,000 l.f.) - row of vertically aligned soldier bricks below the joint. Above Horizontal Control Joints (400 l.f.) - first row of bricks above the joint. Away from Vertical Control Joints (110 l.f.) - one full brick width (8 inches) away from both sides of the joint. Remainder of parapet wall materials to be segregated through verification sampling for removal and off-site disposal as general demolition debris, pending sample results.	Below Cap Joint (1 per 50 l.f.)	20
		Above Horizontal Control Joints (1 per 50 l.f.)	8
		Away from Vertical Control Joints (1 per elevation)	4
RTU Enclosure Walls	RTU Enclosure walls scheduled for removal as part of roof replacement project. Removal of materials to be conducted as follows: Caulking, mortar, and backing materials removed for disposal as ≥ 50 ppm PCB waste. Brick materials attached or in direct contact with caulking to be removed for off-site disposal as ≥ 50 ppm PCB wastes as follows: Cap to Cap Joints (50 l.f.) - all cap materials. Below Cap to RTU Wall Joints (400 l.f.) - first row of brick below the joint. Remainder of RTU enclosure walls to be segregated through verification sampling for removal and off-site disposal as general demolition debris, pending sample results.	Cap to RTU Wall Joints (1 per 50 l.f.)	8
Vertical Control Joints (1,950 l.f.) [2]	Caulking and backing materials to be removed and replaced at exterior vertical control joints on the building wall and penthouse walls. All caulking, mortar, backing materials and building materials in direct contact with the joint and to a distance of 8 inches (one full brick width) requiring removal as part of general facade repair to be removed for off-site disposal as PCB Bulk Product Waste. Brick materials within the return of the joint scheduled to remain in place to be encapsulated using two coats of a liquid epoxy coating. Materials within one full brick width(8 inches) on both sides of the joint scheduled to remain in place to be encapsulated using two coats of clear acrylic coating, or equivalent, pending verification testing to determine extent of encapsulation. Verification of encapsulation conducted through collection of verification wipe samples from encapsulated surfaces following application.	High Occupancy Areas (300 l.f.)	
		Bulk Samples (1 per 50 l.f.)	6
		Wipe Samples - Former Direct Contact subsequently covered with new caulking (1 per 200 l.f.)	2
		Wipe Samples - Away from Joint (1 per 50 l.f.)	6
		Low Occupancy Areas (1,650 l.f.)	
		Bulk Samples (1 per 200 l.f.)	9
		Wipe Samples - Former Direct Contact subsequently covered with new caulking (1 per 200 l.f.)	9
		Wipe Samples - Away from Joint (1 per 200 l.f.)	9

Table 3-1
Summary of Proposed Remedial Approach

Cashin Residence
UMass Amherst

Work Area	Remedial Approach	Verification Sampling Strategy	
		Sample Frequency	**Number of Samples [1]**
Horizontal Control Joints (5,750 l.f.) [2]	Caulking and backing materials to be removed and replaced at exterior horizontal control joints (including penthouse wall joints and stairwell penthouse access door joints). All caulking, mortar, and backing materials to be removed for disposal as ≥ 50 ppm PCB waste. Building materials in direct contact with the joint, in the first row of brick above the joint, and in the first three rows of brick below the joints requiring removal as part of general facade repair to be removed for off-site disposal as ≥ 50 ppm PCB waste. Brick materials within the return of the joints scheduled to remain in place to be encapsulated using two coats of a liquid epoxy coating. Materials above and below joints in high occupancy areas (≤ 8' 8" above ground surface) scheduled to remain in place to be encapsulated using two coats of clear acrylic coating, or equivalent, to a distance of one full brick row above and three full brick rows below the joints, pending verification testing to determine the extent of encapsulation. Verification of encapsulation conducted through collection of verification wipe samples from encapsulated surfaces following application.	High Occupancy Areas (500 l.f.)	
		Bulk Samples (1 sample set per each side of the building, 2 samples per each sample set)	8 [3]
		Wipe Samples - Former Direct Contact subsequently covered with new caulking (1 per 200 l.f.)	3
		Wipe Samples - Away from Joint (1 per 50 l.f.)	10
		Low Occupancy Areas (5,250 l.f.)	
		Bulk Samples (1 per 200 l.f.)	27
		Wipe Samples - Former Direct Contact subsequently covered with new caulking (1 per 200 l.f.)	27
		Wipe Samples - Away from Joint (N/A)	Based on previous work, a coating is not anticipated to be applied.

Notes:
(1) Number of verification samples includes those samples previously collected as described in the text of the report.
(2) Total linear footage includes building wall control joints, penthouse wall control joints, and stairwell penthouse access door joints.
(3) A total of 8 samples to be collected, four samples above the joint and four samples below the joint.
l.f.. = linear feet
N/A = Not Applicable

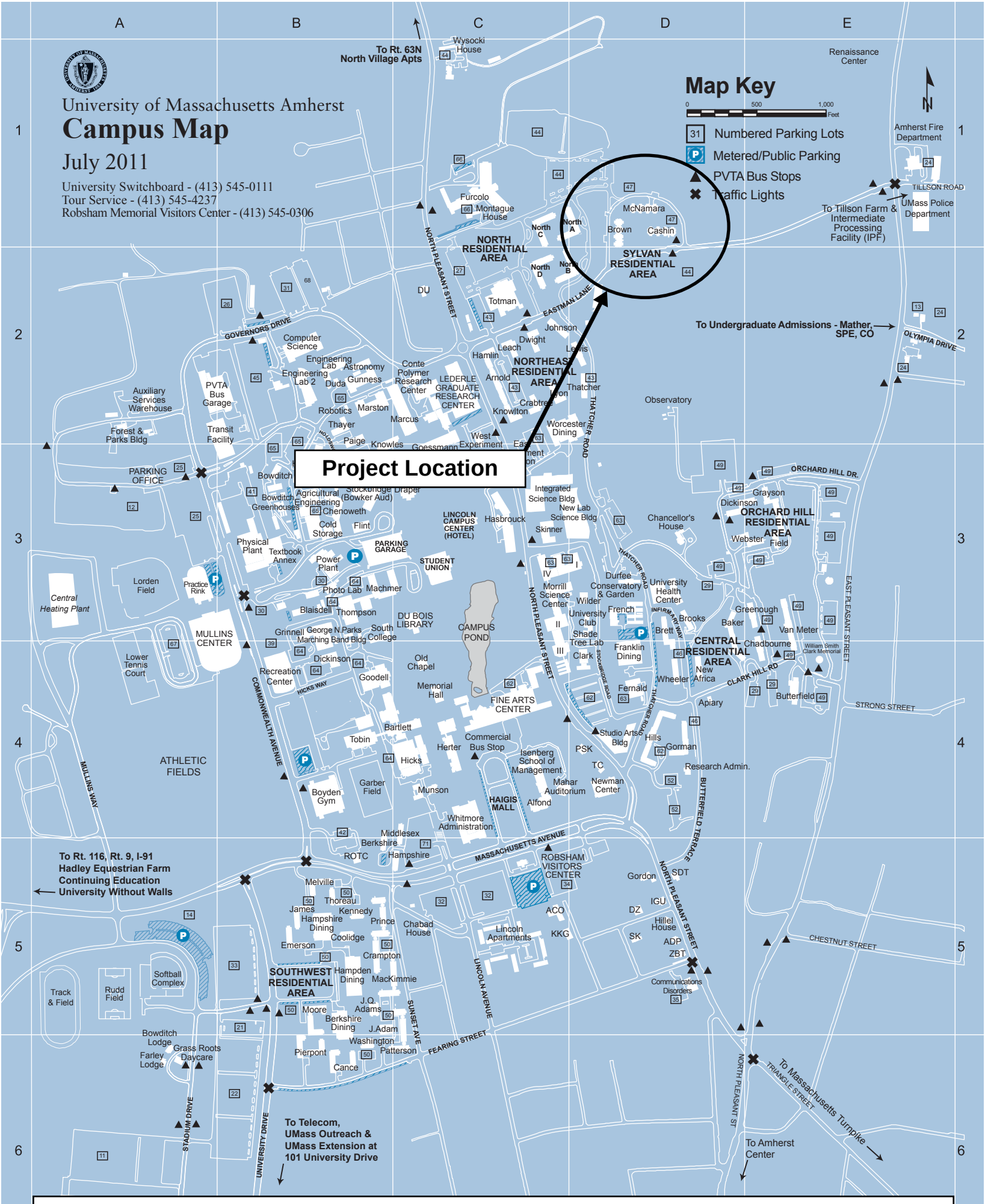

Figure 1-1 Site Location Map

NORTH ELEVATION

Scale: 1/16" = 1'-0"

LEGEND

CR-CBB-032 ▲	BRICK SAMPLE LOCATION AND IDENTIFIER
AGS	ABOVE GROUND SURFACE
CR-CK-012 ●	CAULKING SAMPLE LOCATION AND IDENTIFIER

NOTES:

1. ORIGINAL DESIGN DRAWINGS BY UNIVERSITY OF MASSACHUSETTS FACILITIES AND CAMPUS PLANNING WITH THE ADDITION OF CHARACTERIZATION SAMPLES COLLECTED FOR PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

BUILDING MATERIALS CHARACTERIZATION SAMPLE LOCATIONS – NORTH ELEVATION

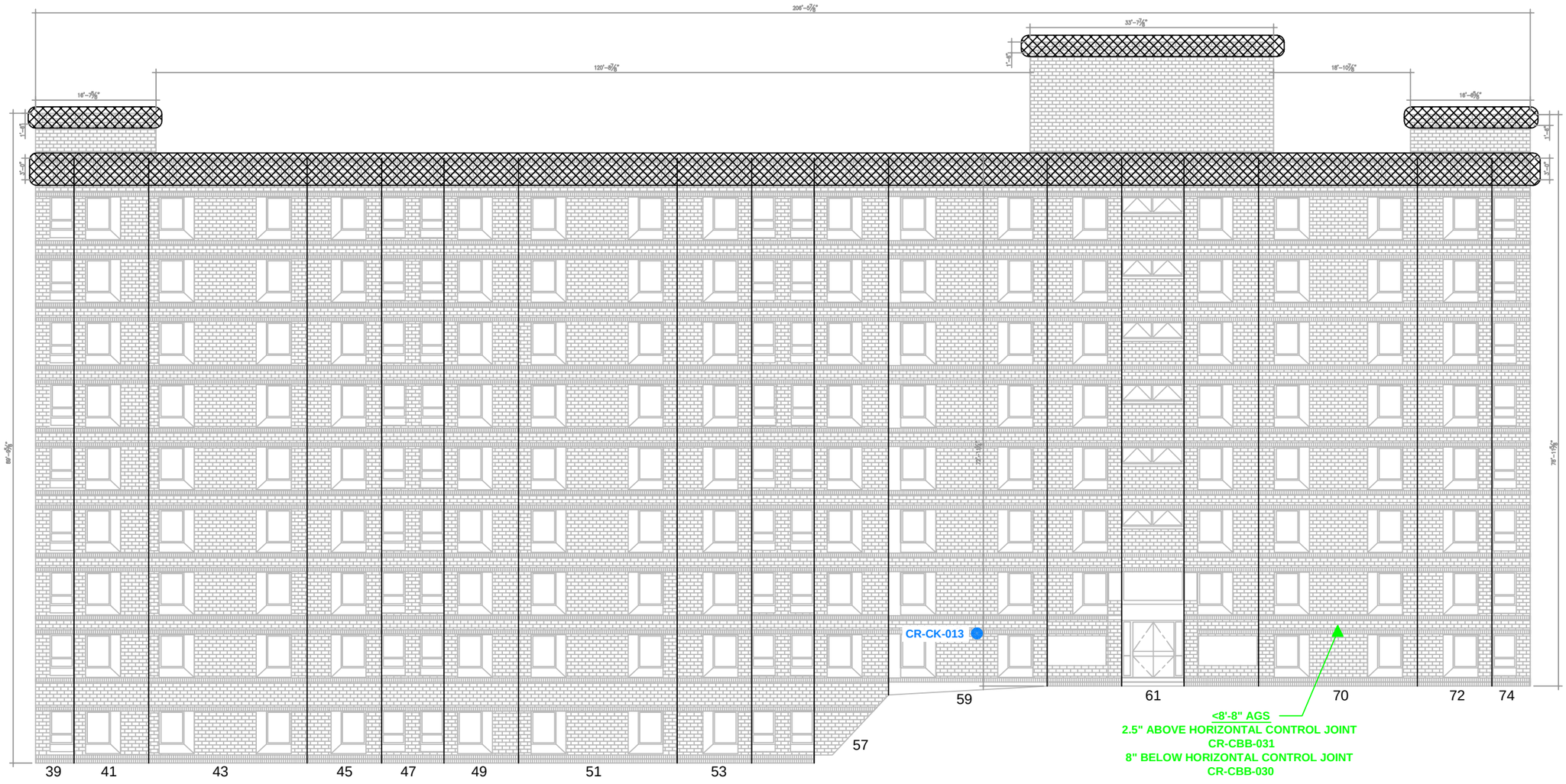
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
FIGURE 2-1.DWG

UMASS CASHIN RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION PLAN

JOB NO: 226020
DATE: FEBRUARY 2013
SCALE: AS NOTED

FIGURE 2-1



SOUTH ELEVATION

Scale: 1/16" = 1'-0"

LEGEND

CR-CBB-031 ▲	BRICK SAMPLE LOCATION AND IDENTIFIER
AGS	ABOVE GROUND SURFACE
CR-CK-013 ●	CAULKING SAMPLE LOCATION AND IDENTIFIER

NOTES:

1. ORIGINAL DESIGN DRAWINGS BY UNIVERSITY OF MASSACHUSETTS FACILITIES AND CAMPUS PLANNING WITH THE ADDITION OF CHARACTERIZATION SAMPLES COLLECTED FOR PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

BUILDING MATERIALS CHARACTERIZATION SAMPLE LOCATIONS – SOUTH ELEVATION

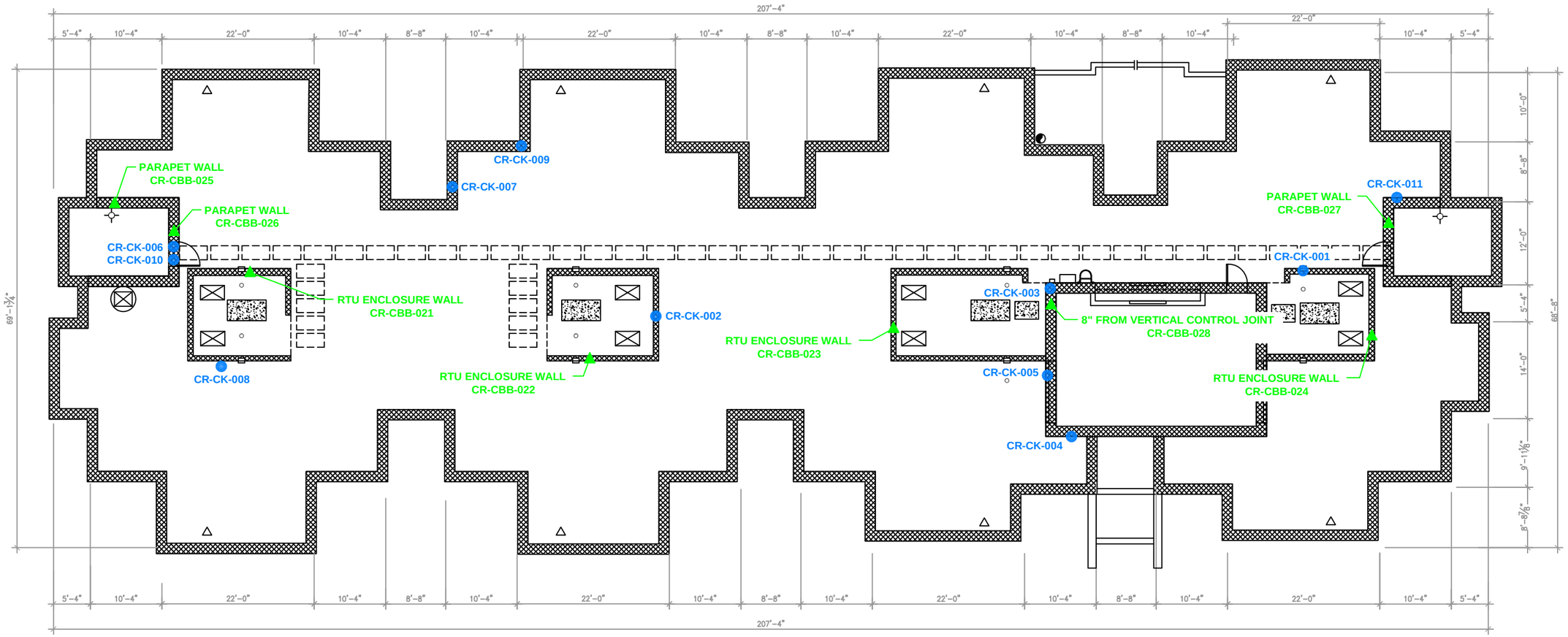
DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
FIGURE 2-2.DWG

UMASS CASHIN RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION PLAN

JOB NO: 226020
DATE: FEBRUARY 2013
SCALE: AS NOTED

FIGURE 2-2



MAIN ROOF AREA PLAN

Scale: 1/16" = 1'-0"

LEGEND

CR-CBB-032 ▲ SAMPLE LOCATION AND IDENTIFIER

CR-CK-001 ● CAULKING SAMPLE LOCATION AND IDENTIFIER

NOTES:

1. ORIGINAL DESIGN DRAWINGS BY UNIVERSITY OF MASSACHUSETTS FACILITIES AND CAMPUS PLANNING WITH THE ADDITION OF CHARACTERIZATION SAMPLES COLLECTED FOR PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS ORIGINALLY PRESENTED IN THE DRAFT DESIGN DRAWINGS.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

BUILDING MATERIALS CHARACTERIZATION SAMPLE LOCATIONS – ROOFTOP AREA

DESIGNED BY: GJF
DRAWN BY: EVR
CHECKED BY: JAH
FIGURE 2-3.DWG

UMASS CASHIN RESIDENCE
AMHERST, MASSACHUSETTS

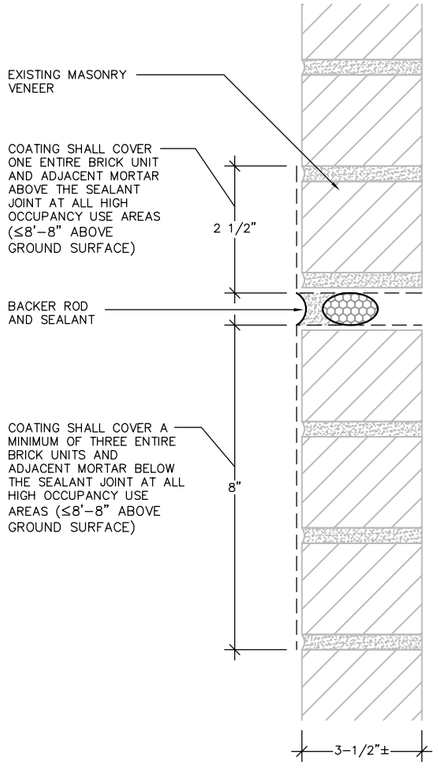
PCB REMEDIATION PLAN

JOB NO: 226020
DATE: FEBRUARY 2013
SCALE: AS NOTED

FIGURE 2-3

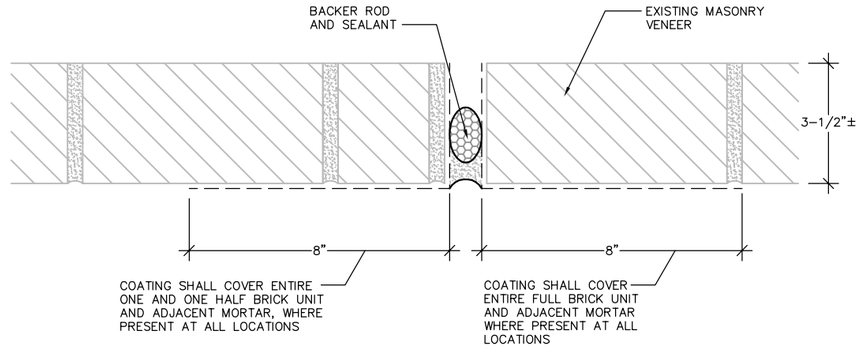
TYPICAL HORIZONTAL CONTROL JOINT

SCALE: NOT TO SCALE



TYPICAL VERTICAL CONTROL JOINT (PLAN)

SCALE: NOT TO SCALE



NOTE:

VERIFICATION BULK SAMPLES TO BE COLLECTED AT LOW OCCUPANCY AREAS AT A FREQUENCY OF 1 SAMPLE PER 200 LINEAR FEET OF CAULKED JOINT (>8' 8" ABOVE GROUND SURFACE) AND AT A MINIMUM FREQUENCY OF 1 SAMPLE PER 50 LINEAR FEET OF CAULKED JOINT IN HIGH OCCUPANCY AREAS (≤8' 8" ABOVE GROUND SURFACE) TO VERIFY REQUIRED EXTENT OF ENCAPSULATION.

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COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

PROPOSED EXTENT OF ENCAPSULATION – HORIZONTAL AND VERTICAL CONTROL JOINTS

DESIGNED BY:	GJF
DRAWN BY:	EVR
CHECKED BY:	JAH
FIGURE	3-1.DWG

UMASS CASHIN RESIDENCE
AMHERST, MASSACHUSETTS

PCB REMEDIATION PLAN

JOB NO:	226020
DATE:	FEBRUARY 2013
SCALE:	N.T.S.

FIGURE 3-1

APPENDIX A: WRITTEN CERTIFICATION

WOODARD & CURRAN

Certification

Project – Cashin Residence
Sylvan Residential Area
102 Eastman Lane
UMass Amherst

The undersigned owner of the property where the cleanup site is located and the party conducting the cleanup certify that all sampling plans, sampling collection procedures, sample preparation procedures, extraction procedures and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site, are on file at the location indicated below and are available for EPA inspection, as set forth below.

Document Location

University of Massachusetts

Environmental Health and Safety

40 Campus Center Way

Amherst, MA 01003-9244

Property Owner and Party Conducting the Cleanup

Donald A Robinson, PhD
Authorized Signature

3-14-2013
Date

Donald Robinson
Name of Authorized representative (print)

Director Env. Health + Safety
Title

APPENDIX B: LABORATORY ANALYTICAL REPORTS & DATA VALIDATION SUMMARY

APPENDIX C: PERIMETER DUST MONITORING PLAN

APPENDIX C – SUPPORT ZONE/PERIMETER DUST MONITORING PLAN

Airborne particulate matter (PM) consists of many different substances suspended in air in the form of particles (solids or liquid droplets) that vary widely in size. Inhalation hazards are caused if the intake of these particles includes intake of vapors and/or contaminated dust. Particles less than 10 micrometers in diameter (PM-10), which include both respirable fine (less than 2.5 micrometers) and coarse (less than 10 micrometers) dust particles, pose the greatest potential health concern because they can pass through the nose and throat and get into the lungs.

During the performance of the planned remediation activities, particulate matter in the form of potentially PCB-affected dust may be generated. The greatest potential for the generation of affected dust is during the removal of PCB containing building materials.

As indicated in the remediation plan, the main dust control mechanism to be employed on the project will be the use of engineering controls (e.g. wet techniques and misting), polyethylene containment structures, and personal protective equipment (PPE). In addition, particulate air monitoring will be conducted during intrusive or dust-generating activities in the Support Work Zone (SWZ) and perimeter to the SWZ. The SWZ is the area just outside of the active work areas, in designated safe work zones or support zones. Particulate air monitoring will determine if fugitive dust particles are present in the ambient air within the designated SWZ and/or perimeter during active removal activities. A direct-reading particulate meter will be used to monitor airborne particulate concentrations during site activities. Particulate concentrations shall be utilized as an indirect indicator of exposures to on-site receptors.

Dust concentrations in the SWZ will be measured using a suitable real time aerosol particulate monitor capable of determining ambient air fugitive dust concentrations to 0.001 milligrams per cubic meter (mg/m^3). Dust monitoring shall be conducted while parapet wall segregation activities are occurring at a frequency of one reading every two hours. Prior to the active removal actions and at periodic points during the project, dust monitoring readings will be recorded to document background particulate matter concentrations.

If total particulate concentrations in the SWZ exceed the action limits (as specified below and incorporating background readings) and are sustained (i.e. greater than 5 minutes), then the following actions will be taken:

- Engineering controls (HEPA filtration, containment, etc.) will be inspected to insure proper operation;
- Work practices will be evaluated:
- Additional dust suppression techniques to mitigate fugitive dust shall be initiated.

If applicable, the dust suppression techniques shall involve the application of a fine mist of water over the area creating the fugitive dust condition. The water shall be applied either by small hand held sprayers or sprinklers. In the event that the total of airborne particulate cannot be maintained below the action limit in the SWZ, then work activities shall be ceased until sustained readings are below the action limit or the SWZ designation is re-evaluated.

OSHA has published the following permissible exposure limits (8 hour time weighted average) for air contaminants (29 CFR 1910.1000):

Air Contaminant	PEL (8-hour TWA)
Total Dust	15 mg/m^3
Respirable Dust Fraction	5 mg/m^3
PCBs (42% Chlorine)	1 mg/m^3
PCBs (54% Chlorine)	0.5 mg/m^3

In addition, EPA has established a National Ambient Air Quality Standard for PM-10 of 0.150 mg/m^3 (24-hr average).

A total airborne particulate action limit has been established for the building material removal work to be conducted at the Cashin Residence with consideration of the specific receptors, PCB concentrations, work activities, and OSHA

permissible exposure limits. The action limit applies only to dust monitoring within the SWZ and perimeter to the SWZ; an action limit has not been set for the active work zones (exclusion zones) as engineering controls and PPE will be used within these zones.

Given the residential nature of surrounding buildings and the anticipated PCB concentration in dust that may be generated during abatement activities, a conservative action limit of 0.1 mg/m^3 above background will be maintained during site work. Dust monitoring at a location representative of background conditions (i.e. a location upwind without active remedial activities in progress) will be conducted at the same frequency as SWZ monitoring to obtain data representative of real-time background conditions. The action limit will be used to determine if and when additional engineered controls and/or work stoppages would be necessary.

APPENDIX D: PRODUCT INFORMATION

Technical Data Sheet

10/6/2010

5 Minute® Epoxy Gel

Description: Thixotropic/non-migrating gel adhesive with excellent gap-filling properties.

Intended Use: Bonding metal, ceramic, wood and vertical surface where gap-filling is needed.

Product features:
Good solvent resistance
Fills gaps to .250 inches
Non-sagging adhesive

Limitations: None

Typical Physical Properties:

Technical data should be considered representative or typical only and should not be used for specification purposes.

Cured 7 days @ 75° F	
Adhesive Tensile Lap Shear[GBS]	2,500 psi @ 0.010" bondline
Dielectric Strength	440 volts/mils
Gap Fill	Excellent
Impact Resistance	6.5 ft.lb./in(2)
Service Temperature	-40°F to 200°F
Shore Hardness	80 Shore D
Solids by Volume	100
Specific Volume	23.7 in[3]/lb.
Tensile Elongation	5%
Tpeel	2-3 pli

Uncured	
Color	Opaque
Fixture Time	10-15 min. @ 72°F
Full Cure	48 hrs.
Functional Cure	1.5 hr. @ 72°F
Mix Ratio by Volume	1:1
Mix Ratio by Weight	1:1
Mixed Density	9.75 lbs/gal.: 1.17 gm/cc
Mixed Viscosity	Gel
Working Time	4-7 min. [28 gm @ 72°F]

TESTS CONDUCTED

Adhesive Tensile Shear ASTM D 1002
Cured Density ASTM D 792
Dielectric Strength, volts/mil ASTM D 149
Compressive Strength ASTM D 695
Cured Hardness Shore D ASTM D 2240

Surface Preparation: Clean surface by solvent-wiping any deposits of heavy grease, oil, dirt, or other contaminants. Surface can also be cleaned with industrial cleaning equipment such as vapor phase degreasers or hot aqueous baths. If working with metal, abrade or roughen the surface to significantly increase the microscopic bond area and increase the bond strength.

Mixing Instructions: ---- Proper homogenous mixing of resin and hardener is essential for the curing and development of stated strengths. ----

25 ML DEV-TUBE
1. Squeeze material into a small container the size of an ashtray.
2. Using mixing stick included on Dev-tube handle, vigorously mix components for one (1) minute.
3. Immediately apply to substrate.

50 ML/400ML/490 ML CARTRIDGES
1. Attach cartridge to Mark V ™ [50ml] 400ml manual or pneumatic dispensing systems.
2. Open tip.
3. Burp cartridge by squeezing out some material until both sides are uniform (ensures no air bubbles are present during mixing).
4. Attach mix nozzle to end of cartridge.
5. Apply to substrate.

Application Instructions:
1. Apply mixed epoxy directly to one surface in an even film or as a bead.
2. Assemble with mating part within recommended working time.

3. Apply firm pressure between mating parts to minimize any gap and ensure good contact (a small fillet of epoxy should flow out the edges to display adequate gap fill.)

For very large gaps:
1. Apply epoxy to both surfaces
2. Spread to cover entire area OR make a bead pattern to allow flow throughout the joint

Let bonded assemblies stand for recommended functional cure time prior to handling.

CAPABILITIES:
Can withstand processing forces
Do not drop, shock load, or heavily load

Storage: Store in a cool, dry place.

Compliances: None

Chemical Resistance: *Chemical resistance is calculated with a 7 day, room temp. cure (30 days immersion) @ 75°F)*

Acetic (Dilute) 10%	Poor	Hydrochloric 10%	Poor
Acetone	Poor	Isopropanol	Poor
Ammonia	Poor	Kerosene	Excellent
Corn Oil	Excellent	Methyl Ethyl Ketone	Poor
Cutting Oil	Excellent	Mineral Spirits	Excellent
Ethanol	Poor	Motor Oil	Excellent
Gasoline (Unleaded)	Excellent	Sodium Hydroxide 10%	Poor
Glycols/Antifreeze	Fair	Sulfuric 10%	Poor

Precautions: Please refer to the appropriate material safety data sheet (MSDS) prior to using this product.

For technical assistance, please call 1-800-933-8266

FOR INDUSTRIAL USE ONLY

Warranty: Devcon will replace any material found to be defective. Because the storage, handling and application of this material is beyond our control, we can accept no liability for the results obtained.

Disclaimer: All information on this data sheet is based on laboratory testing and is not intended for design purposes. ITW Devcon makes no representations or warranties of any kind concerning this data.

Order Information:

14240 25 ml Dev-Tube™
14265 50 ml cartridge
DA052 400 ml cartridge

Construction

Sikagard® 62

High-build, protective, solvent-free, colored epoxy coating

Description	Sikagard 62 is a 2-component, 100% solids, moisture-tolerant epoxy resin. It produces a high-build, protective, dampproofing and waterproofing vapor-barrier system.
Where to Use	Use as a high build, corrosion-resistant, protective coating, as a protective lining for secondary containment structures or as a seamless flooring system.
Advantages	■ Exceptional tensile strength. ■ Good chemical resistance for long-term protection. ■ Convenient A:B = 1:1 mixing ratio. ■ Easy, paint-like viscosity. ■ Available in 3 standard colors: gray, red, and tan. Special color matches available upon request. ■ Excellent bonding to all common structural substrates. ■ Super abrasion resistance for long-term wear. ■ Sikagard 62 gray, after cure, is approved for contact with potable water. ■ Material is USDA certifiable.
Coverage	Approximately 150-250 sq. ft./gal. depending on condition of substrate.
Packaging	4 gal. units; 1 qt. units, 12/case.

How to Use

Surface Preparation	Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants. **Preparation Work: Concrete** - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or equivalent mechanical means. **Steel -** Should be cleaned and prepared thoroughly by blastcleaning.
Mixing	**Pre-mix each component.** Proportion equal parts by volume of Components 'A' and 'B' into a clean mixing container. Mix with a low-speed (400-600 rpm) drill using a Sika paddle for 3 minutes, until uniform in color.
Application	Apply coating using high-quality roller, brush or spray. Two coats are recommended. Apply second coat as soon as the first coat is tack-free and the traffic of application will not damage the first coat. The

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

Shelf Life	2 years in original, unopened containers.
Storage Conditions	Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-75°F (18°-24°C) before using.**
Color	Gray, red, tan.
Mixing Ratio	Component 'A' : Component 'B'=1:1 by volume.
Viscosity (Mixed)	Approximately 3,500 cps.
Pot Life	Approximately 35 to 40 minutes. (60 gram mass).
Tack-Free Time	Approximately 4 hours.
Open Time	Light foot traffic: 5-7 hours. Rubber-wheel traffic: 8-10 hours.
Immersion and Chemical Exposure	Minimum cure: 3 days
Tensile Properties (ASTM D-638)	
14 day	Tensile Strength 5,400 psi (37.3 MPa) Elongation at Break 2.7 %
Abrasion (ASTM D-1044) (Taber Abrader)	
7 day	Weight loss, 1,000 cycles (H-22 wheel, 1,000 gm weight) 0.61 gm
Abrasion Resistance (ASTM D-968)	
14 day	Abrasion Coefficient 51 liters/mil.
Adhesion (ASTM D-3359)	
1 day	Adhesion Classification 4A
Water Absorption (ASTM D-570)	
7 day	(24 hour immersion) 0.1%

Construction

second coat, however, **must** be applied within 48 hours since a longer delay will require additional surface preparation.

Do not spray with slip resistant granules mixed into the coating. For use as a seamless flooring system, consult Technical Service.

Limitations

- Minimum substrate and ambient temperature for application 50°F (10°C).
- Do not apply over wet, glistening surface.
- Material is a vapor barrier after cure.
- Do not apply to porous surfaces exhibiting moisture-vapor transmission during the application. Consult Technical Service.
- Minimum age of concrete prior to application is 21-28 days, depending on curing and drying conditions.
- Do not apply to exterior, on-grade substrates.
- Use oven-dried aggregate only.
- Do not thin with solvents.
- Color may alter due to variations in lighting and/or UV exposure.
- On 'green or 'damp' concrete, EpoCem can be used as a pore filler to reduce vapor drive and potential osmotic blistering.

Caution

Component 'A' - Irritant; Sensitizer - Contains epoxy resin. Can cause sensitization after prolonged or repeated contact. Skin and eye irritant. Vapors may cause respiratory irritation. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of high vapor concentrations, use an appropriate NIOSH approved respirator. Remove contaminated clothing.

Component 'B' - Sensitizer - Contains amines. Contact with eyes or skin may cause severe burns. Can cause sensitization after prolonged or repeated contact. Skin and eye irritant. Vapors may cause respiratory irritation. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of high vapor concentrations, use an appropriate NIOSH approved respirator. Remove contaminated clothing.

First Aid

Eyes: Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove person to fresh air. **Ingestion:** Do not induce vomiting.

In all cases, contact a physician immediately if symptoms persist.

Clean Up

Ventilate area. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically.

Chemical Resistance

Specimen: Two Coats - 10 mils Total
Cured 10 days
Substrate: asbestos cement

Chemical	Test Temp.	Storage Time and Evaluation				
		1 Day	1 Month	2 Months	6 Months	12 Months
Water	75°F (24°C) 100°F (38°C) 140°F (60°C)	A A A	A A A	A A A	A A A, D	A A A, D
Sodium Chloride Solution (Saturated)	75°F (24°F) 100°F (38°C)	A A	A A	A A	A A	A A
Sodium Hydroxide 30%	75°F (24°C)	A	A	A	A	A
Cement Water (Saturated)	75°F (24°C)	A	A	A	A	A
Detergent Solution (5% Ajax)	75°F (24°C) 140°F (60°C)	A A	A A	A A	A A, D	A A, D
Hydrochloric Acid 10%	75°F (24°C)	A	A	A	A	A
Sulfuric Acid 10%	75°F (24°C)	A	A	A	B	B
Oxalic Acid 10%	75°F (24°C)	A	A, D	A, D	A, D	A, D
Citric Acid 10%	75°F (24°C)	A	A, D	A, D	A, D	A, D
Fuel Oil (Home Heating)	75°F (24°C)	A	A	A	A	A, D
Gasoline (Unleaded)	75°F (24°C)	A	A	A	A	A, D
Iso-Octane	75°F (24°C)	A	A	A	A	A, D
Toluol	75°F (24°C)	A	A	A	A	A, D
Silage	75°F (24°C)	A	A	A, D	A, D	B, D
Synthetic Silage	75°F (24°C)	A	A	B, D	B, D	B, D
Ethyl Alcohol	75°F (24°C)	A	C	-	-	-

A: Resistant in permanent contact
B: Temporary resistance
C: Destroyed
D: Discolored

KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION
KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Technical Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

Visit our website at www.sikaconstruction.com **1-800-933-SIKA NATIONWIDE**

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 800-933-7452
Fax: 201-933-6225

Sika Canada Inc.
601 Delmar Avenue
Pointe Claire
Quebec H9R 4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

QUALITY ISO 9001 9002 ACHIEVEMENT

Quality Certification Numbers: Lyndhurst: FM 69711 (ISO 9000), FM 70421 (QS 9000), Marion: FM 69715, Kansas City: FM 69107, Santa Fe Springs: FM 69408

DIVISION 9 - FINISHES

Section 09900 Coatings

Part 1 - General

1.01 Summary

A. This specification describes the coating of substrates with a vapor-barrier, solvent-free, protective, dampproofing, waterproofing, moisture-insensitive, epoxy resin coating.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40ºF (5ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 Submittals

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets and appropriate Material Safety Data Sheets (MSDS).

1.06 Warranty

A. Provide a written warranty from the manufacturer against defects of materials for a period of five (5) years, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturer

A. **Sikagard 62**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

2.02 Materials

A. Epoxy resin coating:

1. Component A shall be a epoxy resin of diglycidilether of bisphenol A containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.

1. Component B shall be primarily a reaction product of a selected amine blend with an epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents, pigments, and accelerators.

2. The ratio of Component A: Component B shall be 1:1 by volume

B. Granules for slip-resistance shall be supplied by the manufacturer of the specified product and shall be able to be mixed into the coating and shall not settle during application.

2.03 Performance Criteria

A. Typical Properties of the mixed epoxy resin coating:

1. Application Life: Approximately 20 - 25 minutes
2. Tack FreeTime: Approximately 4 hours
3. Color: red, grey, tan
4. Solids: 100% VOC g/l : 0.00 Max.
5. Immersion & Chemical Exposure: min. Cure 3 Days

B. Typical Properties of the cured epoxy resin coating:

1. Water Absorption (ASTM D-570) at 7days: 1.0% max. (2 hour boil)
2. Elongation (ASTM D-522) at 14 days: 5% min.
3. Abrasion Resistance (ASTM D-968) at 14 days: 51 liters/mil
4. Adhesion classification (ASTM 3359) at 14 days: 4A min.
5. Abrasion (Taber Abrader) at 7 days: Weight loss: 0.65 gm. max. (H-22 wheel; 1000 gm weight; 1000 cycles)
6. Tensile Properties (ASTM D-638) at 14 days: Tensile Strength 6400 psi (44.1 Mpa) / Elongation at Break 2.7%
7. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
    a. 2 Day (dry cure): 2000 psi min.
    b. 14 Day (moist cure): 1500 psi min.
8. The coating shall have United States Department of Agriculture approval.

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

Part 3 – Execution

3.01 Surface Preparation

A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings.

3.02 Mixing and Application

A. Mixing: Premix each component. Proportion equal parts by volume of Component A and Component B into a clean, dry mixing pail. Mix throughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (35 minutes at 73F). To minimize color difference, blend two complete Components B's together. Use only one of the blended Component B's to mix with a Component A. After the first Component B has been used, blend the second Component B with a new Component B and repeat the above procedeure for the entire application.

B. Placement Procedure: The epoxy resin coating shall be applied only to approved, prepared surfaces with high-quality brushes, rollers, or spray equipment. Coating shall be applied at ambient and substrate temperatures between 50 and 90F. Application thickness shall be between 4-7 mils per coat. Subsequent coats shall be applied within 48 hours of the previous coat. Care is to be taken on vertical and overhead surfaces to avoid sags or runs. If this occurs, it must be sanded out and the area re-coated. If coating of horizontal surfaces that will receive traffic is specified, a slip-resistant aggregate, Sikagard 62 Granules, shall be incorporated into the mixed epoxy resin coating at 1/2 lb./gallon or as directed by the engineer.

C. When applying the coating, if possible never stop the application until the entire surface has been coated. If possible always discontinue at an edge, corner, or joint. Never let a previously coated film dry. Always coat into wet film. Always apply the coating at a 45^0 angle to an edge, corner, or joint.

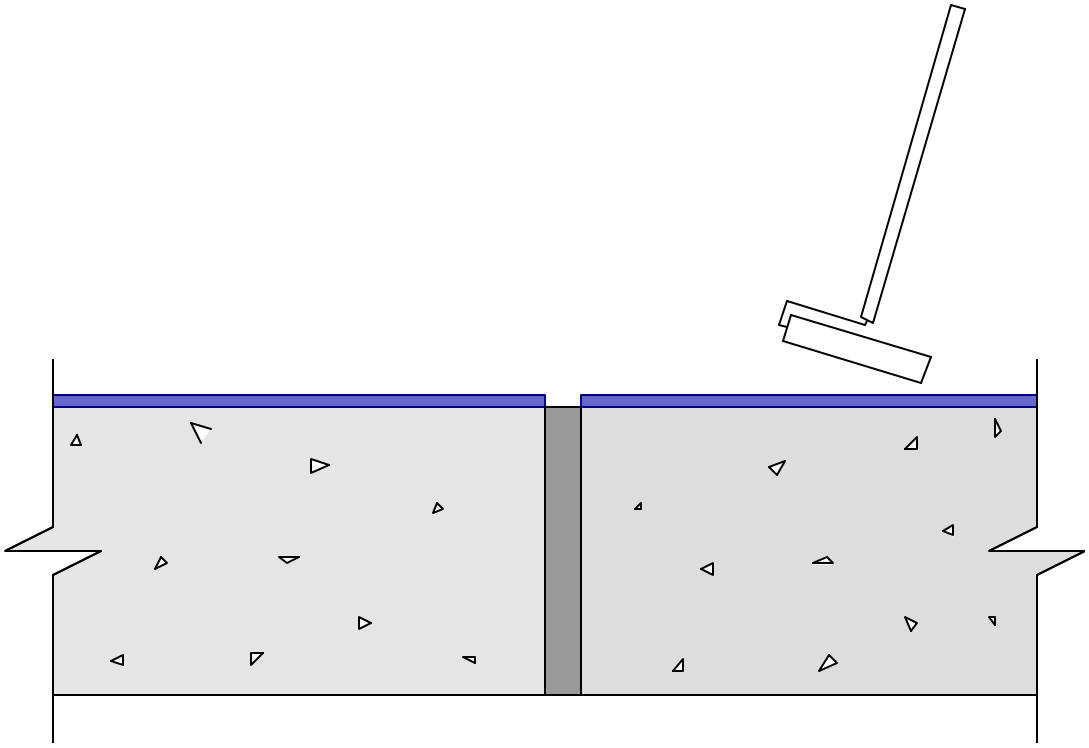
E. Adhere to all limitations and cautions for the epoxy resin as stated in the manufacturers printed literature.

3.03 Cleaning

A. The uncured epoxy resin coating can be cleaned from tools with an approved solvent. The cured epoxy resin coating can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-054 Sikagard 62 Coating



1. Apply Sikagard 62 with high quality brushes or rollers. Care should be taken to avoid sags or runs.

2. When applying the coating, never stop the application until the entire surface has been coated.

3. Subsequent coats shall be applied within 48 hours of the previous coat.

4. For a slip-resistant surface, aggregate shall be incorporated into the mixed epoxy resin coating at a ½ lb./gal.

Note: When applying Sikagard 62 always end at an edge, corner or joint. Do not apply 62 directly over joint filler.

MATERIAL SAFETY DATA SHEET

Sikagard 62 - Part A (ALL COLORS)

HMIS

HEALTH	2
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Manufacturer
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Issue Date: 11/27/2007

Product Name: Sikagard 62 - Part A (ALL COLORS)
CAS Number: Not Established
Chemical Family: Epoxy Compound
MSDS Number: 4220
Product Code: 0601130

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
AROMATIC HYDROCARBON BLEND	68477-31-6		
EPOXY RESIN	25085-99-8		

3. Hazards Identification

Eye Hazards
EYE IRRITANT.

Skin Hazards
MAY CAUSE SKIN IRRITATION. PROLONGED AND/OR REPEATED CONTACT WITH SKIN MAY CAUSE AN ALLERGIC REACTION/SENSITIZATION.

Ingestion Hazards
ACUTELY TOXIC. HARMFUL IF ASPIRATED INTO LUNGS.

3. Hazards Identification - Continued

Inhalation Hazards

MAY CAUSE RESPIRATORY TRACT IRRITATION.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING.
IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

Ingestion

DILUTE WITH WATER. DO NOT INDUCE VOMITING. CONTACT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: 355 °F
Autoignition Point: N/AV °F

Fire And Explosion Hazards

NONE KNOWN

Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

Fire Fighting Instructions

In the event of a fire, firefighters should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

WEARING PROPER PROTECTIVE CLOTHING, CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL. SHOVEL INTO CLOSABLE CONTAINERS. AVOID CONTACT.

7. Handling And Storage

Handling And Storage Precautions

STORE IN A COOL AREA. KEEP CONTAINERS TIGHTLY CLOSED.

Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

8. Exposure Controls/Personal Protection

Engineering Controls

Use with adequate general and local exhaust ventilation. Refer to the current edition of "Industrial Ventilation: A Manual of Recommended Practice" published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

Eye/Face Protection

Safety glasses with side shields or goggles.

Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS.
WEAR CHEMICAL RESISTANT GLOVES.

8. Exposure Controls/Personal Protection - Continued

Respiratory Protection

A respirator protection program that meets 29 CFR 1910.134 requirement must be followed whenever workplace conditions warrant a respirator's use.

Other/General Protection

WASH THOROUGHLY AFTER HANDLING.

Ingredient(s) - Exposure Limits

AROMATIC HYDROCARBON BLEND
- ACGIH TLV: NOT ESTABLISHED
- OSHA PEL: NOT ESTABLISHED
- NTP: NO
- IARC: NO

EPOXY RESIN
- ACGIH TLV: NOT ESTABLISHED
- OSHA PEL: NOT ESTABLISHED
- NTP: NO
- IARC: NO

9. Physical And Chemical Properties

Appearance

LIGHT YELLOW LIQUID

Odor

MILD AROMATIC ODOR

Chemical Type: Mixture
Physical State: Liquid
Melting Point: N/AV °F
Boiling Point: N/AV °F
Specific Gravity: 1.14
Percent Volatiles: 0%
Vapor Pressure: N/AV
Vapor Density: > AIR
Solubility: N/AV
Evaporation Rate: SLOWER THAN ETHER
VOC Content (A+B): < 100 grams / liter

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

Conditions To Avoid (Stability)

NONE KNOWN

Incompatible Materials

STRONG OXIDIZING MATERIALS, ACIDS AND BASES.

Hazardous Decomposition Products

CO, CO2, ALDEHYDES AND OTHER ORGANICS

Conditions To Avoid (Polymerization)

FIRES/EXOTHERM WHEN CURING IN MASS.

11. Toxicological Information

Conditions Aggravated By Exposure

EYE DISEASE, SKIN DISORDERS AND ALLERGIES, CHRONIC RESPIRATORY DISEASE

12. Ecological Information

No Data Available...

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Proper Shipping Name

NOT REGULATED UNDER D.O.T.

15. Regulatory Information

U.S. Regulatory Information

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

SARA Hazard Classes

Acute Health Hazard
Chronic Health Hazard

SARA Section 313 Notification

This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

16. Other Information

HMIS Rating

Health: 2
Fire: 1
Reactivity: 0
PPE: C

Revision/Preparer Information

MSDS Preparer: EHS Department
MSDS Preparer Phone Number: 201-933-8800
This MSDS Supercedes A Previous MSDS Dated: 02/20/2007

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SIKA CORPORATION

MATERIAL SAFETY DATA SHEET

Sikagard 62 - Part B (ALL COLORS)

HMIS

HEALTH	3
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Manufacturer
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

DOT NON CORROSIVE AS PER 11/3/97 TESTING

Issue Date: 11/27/2007

Product Name: Sikagard 62 - Part B (ALL COLORS)
CAS Number: Not Established
Chemical Family: Amine
MSDS Number: 4221
Product Code: 0601792

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
AROMATIC HYDROCARBON BLEND	68477-31-6		
BENZYL ALCOHOL	100-51-6		
PROPRIETARY BLEND OF ALIPHATIC & CYCLIC AMINES	Not Establis		
SILICA, QUARTZ	14808-60-7		

*EXPOSURE TO SILICA, QUARTZ IS APPLICABLE ONLY IF CURED WITH PART "A" AND SANDED.

3. Hazards Identification

Eye Hazards

CONTACT MAY CAUSE SEVERE IRRITATION AND PAIN AND MAY CAUSE BURNS, NECROSIS AND PERMANENT INJURY. MAY CAUSE VISUAL DISTURBANCES, CORNEA DAMAGE, DAMAGE TO THE OPTIC NERVE OR BLINDNESS.

3. Hazards Identification - Continued

Skin Hazards

CONTACT MAY CAUSE SEVERE IRRITATION AND PAIN AND MAY CAUSE BURNS, NECROSIS AND PERMANENT INJURY. PROLONGED AND/OR REPEATED CONTACT WITH SKIN MAY CAUSE ANALLERGIC REACTION/SENSITIZATION.

Ingestion Hazards

ACUTELY TOXIC. HARMFUL IF ASPIRATED INTO LUNGS.

Inhalation Hazards

MAY CAUSE RESPIRATORY TRACT IRRITATION. OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

Ingestion

DILUTE WITH WATER. DO NOT INDUCE VOMITING. CONTACT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: >220 °F
Autoignition Point: N/AV °F

Fire And Explosion Hazards

EXPOSURE TO HEAT BUILDS UP PRESSURE IN CLOSED CONTAINERS.

Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

Fire Fighting Instructions

In the event of a fire, firefighters should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. VENTILATE AREA. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL AND TRANSFER INTO SUITABLE CONTAINERS. AVOID CONTACT.

7. Handling And Storage

Handling And Storage Precautions

STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED.

Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

8. Exposure Controls/Personal Protection

Engineering Controls

Use with adequate general and local exhaust ventilation.

Eye/Face Protection

Safety glasses with side shields or goggles.

Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS. CHEMICAL RESISTANT GLOVES.

Respiratory Protection

A respirator protection program that meets 29 CFR 1910.134 requirement must be followed whenever workplace conditions warrant a respirator's use. In areas where the Permissible Exposure Limits are exceeded, use a properly fitted NIOSH-approved respirator.

Other/General Protection

WASH THOROUGHLY AFTER HANDLING.

Ingredient(s) - Exposure Limits

AROMATIC HYDROCARBON BLEND
- ACGIH TLV: NOT ESTABLISHED
- OSHA PEL: NOT ESTABLISHED
- IARC: NO
- NTP: NO

PROPRIETARY BLEND OF ALIPHATIC & CYCLIC AMINES
- ACGIH TLV: NOT ESTABLISHED
- OSHA PEL: NOT ESTABLISHED
- IARC: NO
- NTP: NO

SILICA, QUARTZ
- ACGIH TLV-TWA 0.1 mg/m3 (Notice of Intended Change)
- ACGIH TLV-TWA 0.05 mg/m3 (Proposed)
- OSHA PEL-TWA 30/%SiO2+2 mg/m3
- OSHA PEL-TWA 10/%SiO2+2 mg/m3
- OSHA PEL-TWA 250/%SiO+5 mppcf

9. Physical And Chemical Properties

Appearance

VISCOUS LIQUID (VARIOUS COLORS)

Odor

AMINE ODOR

Chemical Type: Mixture
Physical State: Liquid
Melting Point: N/AV °F
Boiling Point: N/AV °F
Specific Gravity: 1.70
Vapor Pressure: N/AV
Vapor Density: >AIR
Solubility: N/AV
Evaporation Rate: SLOWER THAN ETHER
VOC Content (A+B): < 100 grams / liter

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

Conditions To Avoid (Stability)
NONE KNOWN

Incompatible Materials
STRONG OXIDIZING AGENTS, ACID AND EPOXY RESINS UNDER UNCONTROLLED CONDITIONS

Hazardous Decomposition Products
CO, CO2, OXIDES OF NITROGEN

11. Toxicological Information

Miscellaneous Toxicological Information

Conditions Aggravated By Exposure
EYE DISEASE, SKIN DISORDERS AND ALLERGIES, CHRONIC RESPIRATORY CONDITIONS

Ingredient(s) - Carginogenicity
SILICA, QUARTZ
NTP - Listed On The National Toxicology Program
Listed In The IARC Monographs

12. Ecological Information

No Data Available...

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Proper Shipping Name
NOT REGULATED BY D.O.T.

15. Regulatory Information

U.S. Regulatory Information
All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

SARA Hazard Classes
Acute Health Hazard
Chronic Health Hazard

SARA Section 313 Notification
This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

State Regulations
WARNING: This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

15. Regulatory Information - Continued

Ingredient(s) - State Regulations

BENZYL ALCOHOL
- New Jersey - Workplace Hazard
- Pennsylvania - Workplace Hazard
- Massachusetts - Hazardous Substance

SILICA, QUARTZ
- New Jersey - Workplace Hazard
- Pennsylvania - Workplace Hazard
- California - Proposition 65
- Massachusetts - Hazardous Substance

16. Other Information

HMIS Rating
Health: 3
Fire: 1
Reactivity: 0
PPE: C

Revision/Preparer Information
MSDS Preparer: EHS Department
MSDS Preparer Phone Number: 201-933-8800
This MSDS Supercedes A Previous MSDS Dated: 02/20/2007

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SIKA CORPORATION

Product Data Sheet
Edition 1.24.2011
Identification no. 604
Sikagard 670W

Construction

Sikagard® 670W

Water dispersed, acrylic, protective, anti-carbonation coating

Description	Sikagard 670W is a water dispersed colored, acrylic, protective coating. Sikagard 670W prevents moisture ingress, is water vapor permeable and provides an excellent carbonation barrier.
Where to Use	Above grade, exterior application on buildings or civil engineering structures. It is designed to aesthetically enhance and protect concrete and other masonry substrates subject to normal hydrothermal movement. Protective, decorative seal coat for SikaColor and Sikadur Balcony Systems.
Advantages	■ Easy to apply. ■ Extremely resistant to dirt pick-up and mildew. ■ Excellent resistance to carbon dioxide and other aggressive gas diffusion. ■ Excellent UV resistance. ■ Excellent weathering resistance. ■ Prevents ingress of chlorides. ■ Cost effective protection. ■ Vapor permeable; allows each way water vapor diffusion (breathable).
Coverage	Theoretical per coat: 300 sq. ft./gal. Wet film thickness: 5 mils. Dry film thickness: 2.5 mils. Normal coating system is two coats minimum at a total nominal dry film thickness of 5 mils. Consumption is obviously dependent on substrate. In addition, allowance must be made for surface profile, variations in applied film thickness, loss and waste. A third coat may be necessary where opacity is reduced through thinning of the first coat, on dense substrates or with very bright color shades.
Packaging	5 gallon, re-closable plastic pails.

How to Use

Surface preparation

All surfaces to be coated must be clean, dry, laitance free, sound and frost-free with curing compound residues and any other contaminants removed. An open textured sandpaper-like surface is ideal (CSP-3). Where necessary, surfaces should be prepared mechanically by blast cleaning or high pressure waterjetting. Allow adequate time for drying. Bugholes, cracks or irregularities of substrate should be filled and leveled with SikaTop, Sika MonoTop leveling mortar or Sikagard Surface Fillers as appropriate.

Typical Data (Material and curing conditions at 73°F (23°C) and 50% R.H.)

Shelf Life 1 year in original, unopened container.

Storage Conditions Store dry at 40°-95°F (4°-35°C). **Condition material to 60°-75°F before using.** Protect from freezing. If frozen, discard.

Colors 463 standard colors. Custom color-matching available.

Pot Life Indefinite, provided proper care is taken in protecting the system from moisture, freezing, contamination, or evaporation.

Solids Content **by weight:** 60% **by volume:** 46%

Waiting and Drying Times

Between Coats:	Rain Resistant After	Final Drying
45°F (7°C) approx. 90 min.	approx. 5 hours	approx. 24 hours
68°F (20°C) approx. 30 min.	approx. 1 hour	approx. 4 hours
85°F (30°C) approx. 20 min.	approx. 40 min.	approx. 3 hours

Water Vapor Diffusion (at 5 mils. = 120 microns dry film thickness)
μ - value H_2O (diffusion coefficient) = 3,140
SdH_2O (equivalent air thickness) = 1.3 ft. (0.4 m)

Carbon Dioxide Diffusion (at 5 mils. = 120 microns dry film thickness)
μ- value CO_2 (diffusion coefficient) = 1,100,000
$SdCO_2$ (equivalent air thickness) = 433 ft. (132 m.)
Equivalent concrete thickness (Sc) = approximately 13 inches (33 cm.)

Moisture Vapor Permeability (ASTM E-96) 17.9 Perms

Flame Spread and Smoke Development (ASTM E-84-94)
Flame Spread: 0 Smoke Development: 5 Class Rating: A

Weathering (ASTM G-26) 2000 hours Excellent, no chalking or cracking.

Construction

Priming	All porous areas or concrete with excessive porosity should be primed using Sikagard 552W Primer or SikaLatex R to allow easy application of Sikagard 670W.
Mixing	Stir thoroughly to ensure uniformity using a low speed (400-600 rpm) drill and Sika paddle. To minimize color variation when using multiple batches, blend two batches of Sikagard 670W. Use one pail and maintain the second pail to repeat this procedure (boxing) for the entire application.
Application	Any areas of glass or other surfaces should be masked. Recommended application temperatures (ambient and substrate) 45°-95°F (5°-35°C). Sikagard 670W can be applied by brush, roller, or spray over entire area moving in one direction. Allow a minimum of 20-90 minutes prior to re-coating. At lower temperatures and high humidity, waiting time will be prolonged. At higher temperatures, work carefully to maintain a 'wet' edge. Sikagard 670W is usually applied using a short nap lambs wool roller. Sikagard 670W is particularly suitable for application by spray using the most standard spray painting equipment. As with all coatings, jobsite mock-ups should always be completed to confirm acceptability of workmanship and material. **Note:** To achieve a dry film thickness of 4-6 mils., two uniform coats should be anticipated. On porous substrates, a third coat may be necessary and on particularly dense substrates, the first coat should be thinned 10% by volume with water. A third coat may then be needed for opacity.
Limitations	■ Do not use over moving cracks. ■ Substrate must be dry prior to the application. ■ Minimum age of concrete prior to the application is 14 days, depending on curing and drying conditions (moisture content must be below 5%). ■ Minimum age of SikaTop or Sika MonoTop thin layer renderings is 3 days prior to the application of 670W (moisture content must be below 5%). ■ Sikagard 670W should not be applied at relative humidities greater than 90%, or if rain is forecast within the specified rain resistance period. ■ Allow sufficient time for the substrate to dry after rain or other inclement conditions. ■ Product must be protected from freezing. If frozen, discard. ■ Not designed for use as a vehicular traffic bearing surface. ■ During application, regular monitoring of wet film thickness and material consumption is advised to ensure that the correct layer thickness is achieved. ■ When overcoating existing coatings, compatibility and adhesion testing is recommended. ■ Do not store Sikagard 670W in direct sunlight for prolonged periods.

Caution

Warning	Avoid breathing vapors. Use only with adequate ventilation. May cause respiratory irritation and headaches.
Irritant	Skin, eye, and respiratory irritant; avoid contact. Use of safety goggles and chemical resistant gloves is recommended. Remove contaminated clothing.
First Aid	In case of eye contact, flush with water for 15 minutes, contact physician immediately. For skin contact, wash skin with soap water. For respiratory problems, remove person to fresh air. Wash clothing before re-use.
Spill Clean Up	Confine spill, ventilate closed areas, and collect with absorbent material. Dispose of in accordance with current, applicable, local, state, and federal regulations. Uncured material can be removed water. Cured material can only be removed mechanically.

Visit our website at www.sikausa.com **1-800-933-SIKA NATIONWIDE**

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

Sika Corporation
201 Polito Avenue
Lyndhurst, NJ 07071
Phone: 800-933-7452
Fax: 201-933-6225

Sika Canada Inc.
601 Delmar Avenue
Pointe Claire
Quebec H9R 4A9
Phone: 514-697-2610
Fax: 514-694-2792

Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537

Spec Component: SC-060-03/10

Sikagard 670W

DIVISION 9 - FINISHES
Section 09880 Protective Coatings

Part 1 - General

1.01 Summary

A. This specification describes the coating of substrates with an anti-carbonation, protective coating.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2008 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have receivced product training by manufacturer's representative

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45ºF (7ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 Submittals

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

B. Submit copy of Certificate of Approved Contractor status by manufacturer.

1.06 Warranty

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturer

A. **Sikagard 670W**, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

B. **Sikagard Elastic Textured Base Coat**, manufactured by SikaCorporation 1682 Marion Williamsport Road, Ohio 43302 is considered to conform to requirements of this specification

C. Sikagard 552W Primer or SikaLatex R, as manufactured by Sika Corporation, 1682 Marion Williamsport Road, Marion, Ohio, 43302 is considered to conform to the requirements of this specification.

2.02 Materials

A. Protective Acrylic Coating:

1. Product shall be 100% Acrylic Emulsion with the following properties:

a. Non-vapor barrier

b. Must resist ingress of chlorides

c. Must resist ingress of carbon dioxide

d. The material shall be non-combustible, both before and after cure.

B. Elastomeric Acrylic Textured Base Coating:

1. Product shall be 100% Acrylic Emulsion with the following properties:

a. Water vapor permeable

b. Can bridge dynamically moving cracks

c. Crack bridging properties maintained at low temperatures

B. Surface Conditioner / Adhesion Promoter:

1. Product shall be a water-based acrylic surface conditioner/ primer and promote adhesion of acrylic coatings.

a. Solids content 12.5% - 20% by volume

b. Recoat time 4- 24 hours

2.03 Performance Criteria

A. Properties of the protective acrylic coating:

1. Pot Life: indefinite
2. Tack Free Time 1 Hour @ 73^{o}F, 50% Relative Humidity. Final Cure < 24 Hours
3. Carbon Dioxide Diffusion: μCO_2 1,100,000 Carbon Dioxide Diffusion Resistance at 5 mils (120 microns) $SdCO_2$ = 433 ft (132 m) equivalent air thickness. i.e. Approx. 13-in. of standard concrete cover.
4. Water Vapor Diffusion: μH_2O 13,140. Water Vapor Diffusion Resistance at 5 mils (120 microns) SdH_2O = 1.3 ft (0.4 m) equivalent air thickness.
5. Moisture Vapor permeability (ASTM E96) 17.9 perms
6. Solids content: By weight: 60% By Volume: 46%
7. Flame spread and smoke development (ASTM E-84-94)

a. Flame Spread 0

b. Smoke Development 5

c. Class Rating A

8. Resistance to wind driven rain (TT-C-555B): No passage of water through coating.

Note: Tests above were performed with the material and curing conditions @ 71°F – 75°F and 45-55% relative humidity.

Part 3 – Execution

3.01 Surface Preparation

A. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for coatings and fall within CSP1 to CSP3.

3.02 Mixing and Application

A. Mixing: Stir materials to ensure uniformity using a low speed (400-600 rpm) drill and paddle. To minimize color variation, blend two batches of material.(boxing)

B. Coating Application: Apply by brush, roller, or spray over entire area moving in one direction. A minimum of two coats are required. Each coat should be applied at a rate not to exceed 250-sq. ft. per gallon. Total dry film thickness shall be a minimum 2.5 – 3 dry mils per coat. Allow a minimum of 1 hour prior to re-coating.

C. When applying the coating, never stop the application until the entire surface has been coated. Always stop application at an edge, corner, or joint. Never let a previously coated film dry; always coat into a wet film. Always apply the coating at a 45° angle to an edge, corner, or joint.

D. If substrate has been previously coated and presents a “chalky” condition, apply 1 coat of Sikagard 552W or Sika Latex R, primer/surface conditioner by brush, roller, or spray at a rate not to exceed 300 sq. ft. per gallon.

E. Adhere to all limitations and cautions for the acrylic coating in the manufacturer's printed literature.

3.03 Cleaning

A. The uncured acrylic coating can be cleaned from tools with water. The cured acrylic coating can only be removed mechanically.

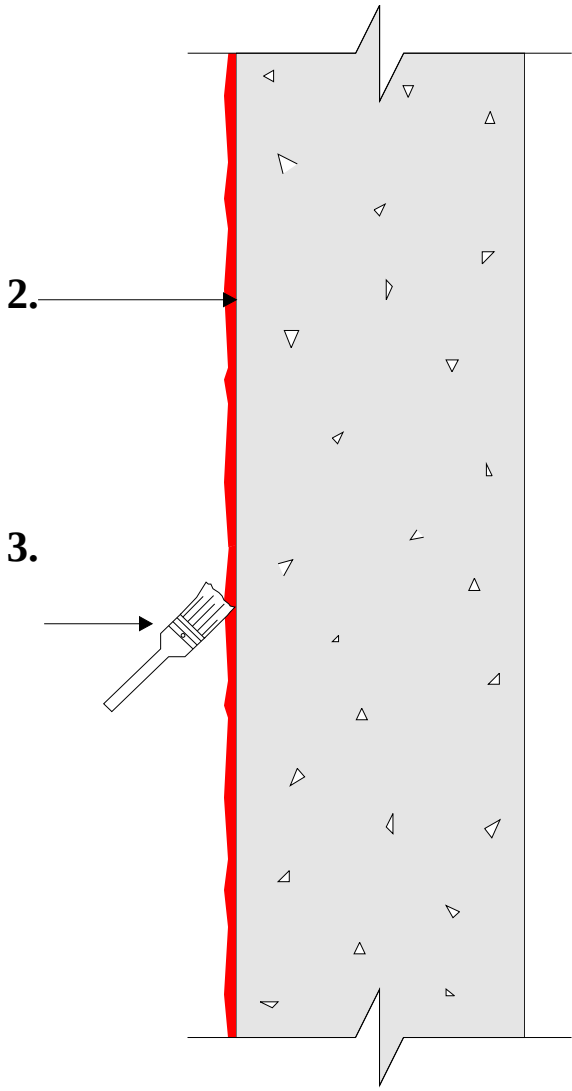
B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-060 Sikagard 670W®, Anti-Carbonation, Protective Coating

1. **Substrate must be dry, clean and sound.**

2. **Condition surface with Sikagard 552W or SikaLatex R(as needed)**

3. **Apply Sikagard 670W by brush, roller or spray over entire area moving in one direction.**



Concrete Restoration Systems by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071

ANY LEGAL THEORY TO ANY THIRD PARTY FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING FROM THE USE OF THESE GUIDE SPECIFICATIONS. The specifier, architect, engineer or design professional or contractor for a particular project bears the sole responsibility for the preparation and approval of the specifications and determining their suitability for a particular project or application.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Technical Data Sheet, product label and Material Safety Data Sheet which are available at www.sikaconstruction.com or by calling (201) 933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instructions for each Sika product as set forth in the current Technical Data Sheet, product label and Material Safety Data Sheet prior to product use.

MATERIAL SAFETY DATA SHEET

Sikagard 670W - All Colors

HMIS

HEALTH	1
FLAMMABILITY	1
REACTIVITY	0
PERSONAL PROTECTION	C

1. Product And Company Identification

Supplier
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Manufacturer
Sika Corporation
201 Polito Ave
Lyndhurst, NJ 07071

Company Contact: EHS Department
Telephone Number: 201-933-8800
FAX Number: 201-933-9379
Web Site: www.sikausa.com

Supplier Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer Emergency Contacts & Phone Number
CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Issue Date: 08/14/2007

Product Name: Sikagard 670W - All Colors
CAS Number: Not Established
MSDS Number: 4154
Product Code: 0690543

2. Composition/Information On Ingredients

Ingredient Name	CAS Number		Percent Of Total Weight
CALCIUM CARBONATE	471-34-1		
TALC	14807-96-6		
TITANIUM DIOXIDE	13463-67-7		

3. Hazards Identification

Eye Hazards
EYE IRRITANT.

Skin Hazards
MAY CAUSE A REVERSIBLE INFLAMMATORY EFFECT ON SKIN OR TISSUE AT THE SITE OF CONTACT.

Ingestion Hazards
NOT NORMALLY INGESTED.

Inhalation Hazards
MAY CAUSE A REVERSIBLE INFLAMMATORY EFFECT ON THE UPPER RESPIRATORY SYSTEM.

4. First Aid Measures

Eye

RINSE EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. CONSULT PHYSICIAN.

Skin

WASH SKIN THOROUGHLY WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING.IF SYMPTOMS PERSIST CONSULT PHYSICIAN.

Ingestion

CONSULT PHYSICIAN.

Inhalation

REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, INSTITUTE ARTIFICIAL RESPIRATION. CONSULT WITH PHYSICIAN.

5. Fire Fighting Measures

Flash Point: >200 °F

Fire And Explosion Hazards

NONE KNOWN

Extinguishing Media

In case of fire, use water spray (fog) foam, dry chemical, or CO2.

Fire Fighting Instructions

Firefighters should wear self-contained breathing apparatus and full protective gear.

6. Accidental Release Measures

WEAR SUITABLE PROTECTIVE EQUIPMENT. ELIMINATE SOURCES OF IGNITION. VENTILATE AREA. CONTAIN SPILL AND COLLECT WITH ABSORBENT MATERIAL. TRANSFER INTO A SUITABLE CONTAINER.

7. Handling And Storage

Handling And Storage Precautions

VENTILATION SHOULD BE SUFFICIENT TO REDUCE AIR CONTAMINANTS TO BELOW PELs. IFPELs ARE EXCEEDED WEAR APPROPRIATE, PROPERLY FITTED NIOSH/MSHA APPROVED RESP IRATOR.

Work/Hygienic Practices

Wash thoroughly with soap and water after handling.

8. Exposure Controls/Personal Protection

Engineering Controls

Use with adequate general and local exhaust ventilation.

Eye/Face Protection

Safety glasses with side shields or goggles.

Skin Protection

AVOID SKIN CONTACT. WEAR LONG SLEEVE SHIRT AND LONG PANTS. CHEMICAL RESISTANT RUBBER OR PLASTIC GLOVES.

Respiratory Protection

In areas where the P.E.L.s are exceeded, use a properly fitted NIOSH-approved respirator.

Ingredient(s) - Exposure Limits

CALCIUM CARBONATE

ACGIH TLV-TWA 10 mg/m3

8. Exposure Controls/Personal Protection - Continued

Ingredient(s) - Exposure Limits - Continued

OSHA PEL-TWA 15 mg/m3
OSHA PEL-TWA 5 mg/m3
TALC
ACGIH TLV-TWA 2 mg/m3
OSHA PEL-TWA 20 mppcf
TITANIUM DIOXIDE
ACGIH TLV-TWA 10 mg/m3
OSHA PEL-TWA 15 mg/m3

9. Physical And Chemical Properties

Appearance

THICK EMULSION IN COLORS

Odor

LATEX

Chemical Type: Mixture
Physical State: Liquid
Melting Point: N/A °F
Boiling Point: N/AV °F
Specific Gravity: 1.35
Percent Volatiles: N/AV
Percent VOCs: 4.1%
Packing Density: 11.24 lb / gallon
Vapor Density: N/AV
pH Factor: N/AV
Solubility: MISCIBLE
VOC Content: 47.8 grams/ liter (USEPA Method 24)

10. Stability And Reactivity

Stability: STABLE
Hazardous Polymerization: WILL NOT OCCUR

Conditions To Avoid (Stability)

NONE KNOWN

Incompatible Materials

NONE KNOWN

11. Toxicological Information

Miscellaneous Toxicological Information

This product contains chemical(s) known to the state of California to cause cancer, birth defects or other reproductive harms.

Ingredient(s) - Carginogenicity

TALC
Listed In The IARC Monographs

12. Ecological Information

No Data Available...

13. Disposal Considerations

Dispose in accordance with applicable federal, state and local government regulations.

14. Transport Information

Proper Shipping Name

NOT REGULATED BY D.O.T.

15. Regulatory Information

U.S. Regulatory Information

All ingredients of this product are listed or are excluded from listing under the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

SARA Hazard Classes

Acute Health Hazard

SARA Section 313 Notification

This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

Ingredient(s) - State Regulations

CALCIUM CARBONATE
- Pennsylvania - Workplace Hazard

TALC
- New Jersey - Workplace Hazard
- Pennsylvania - Workplace Hazard
- Massachusetts - Hazardous Substance

TITANIUM DIOXIDE
- New Jersey - Workplace Hazard
- Pennsylvania - Workplace Hazard
- New York City - Hazardous Substance

16. Other Information

HMIS Rating

Health: 1
Fire: 1
Reactivity: 0
PPE: C

Revision/Preparer Information

MSDS Preparer: EHS Department
MSDS Preparer Phone Number: 201-933-8800
This MSDS Supercedes A Previous MSDS Dated: 08/13/2007

Disclaimer

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