

Prepared for:

**Santa Monica-Malibu Unified School District
Santa Monica, California**

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CONTRACTOR SPECIFICATIONS FOR PCB-RELATED REMEDIATION FOR BUILDING F OF JUAN CABRILLO ELEMENTARY SCHOOL FOR THE SANTA MONICA-MALIBU UNIFIED SCHOOL DISTRICT



CONTENTS

1.	INTRODUCTION AND BACKGROUND INFORMATION	1
1.1	Introduction	1
1.2	Background Information	2
1.2.1	Previous PCB Investigation/Remediation Work Completed	3
1.2.2	Presence of Asbestos	4
2.	ASSUMED PCB CONTAINING BUILDING MATERIAL REMOVAL/REMEDICATION PROCEDURES	5
2.1	Summary of Remediation Plan	5
2.2	Remediation Goals	6
2.3	Engineering Controls to be Established by Contractor	7
2.4	Air Monitoring Conducted by Contractor	7
2.5	Summary of Remediation Procedures to be Performed by Contractor	8
2.5.1	Rooms 18, 19, 22 and 23	8
2.5.2	Rooms 16, 17, 20 and 21	9
2.6	Proposed Contractor Procedures for Decontamination of Substrate in Contact with Materials Assumed to Contain PCBs at Regulated Levels (if necessary)	10
2.7	Proposed Contractor Procedures for Encapsulation of Adjacent Porous Substrate in Contact with Materials Assumed to Contain PCBs at Regulated Levels (if necessary)	10
2.8	Confirmatory Sampling Program Conducted by Ramboll Environ	11
2.8.1	Porous Building Materials (e.g. wood, concrete, brick)	11
2.8.2	Nonporous Building Materials (if needed)	12
2.8.3	Postremediation Confirmatory Air and Wipe Samples	12
2.8.3.1	Air Sampling	12
2.8.3.2	Wipe Sampling	13
2.9	Contingency Plan	13
2.10	Data Validation	13
2.11	Waste Management and Disposal	14
2.12	Recordkeeping and Documentation	14
2.13	Certification	14
3.	REFERENCES	15

FIGURES

- Figure 1: Site Plan
Figure 2: Detail of Building F

APPENDICES

- Appendix A: Locations of Caulk Removal and Areas of Encapsulation in Rooms 18, 19, 22 and 23

ACRONYMS AND ABBREVIATIONS

BMP	best management practice
Cal/OSHA	California Division of Occupational Safety and Health
CFR	Code of Federal Regulation
DOT	Department of Transportation
ENVIRON	ENVIRON International Corporation
HEPA	high-efficiency particulate air
HPLC	high-performance liquid chromatography
HVAC	heating, ventilation, and air conditioning
JCES	Juan Cabrillo Elementary School
L/min	liters per minute
$\mu\text{g}/100\text{ cm}^2$	micrograms per 100 cubic centimeters
mg/kg	milligram(s) per kilogram
mg/m^3	milligram(s) per cubic meter
ng/m^3	nanograms per cubic meter
PCB	polychlorinated biphenyl
PEL	permissible exposure limit
PPE	personal protective equipment
ppm	parts per million
Ramboll Environ	Ramboll Environ US Corporation
RCRA	Resource Conservation and Recovery Act
SMMUSD or District	Santa Monica-Malibu Unified School District
TWA	time-weighted average
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency

1. INTRODUCTION AND BACKGROUND INFORMATION

1.1 Introduction

On behalf of the Santa Monica – Malibu Unified School District (SMMUSD or the District), Ramboll Environ US Corporation¹ (Ramboll Environ) has prepared these contractor specifications for polychlorinated biphenyl (PCB)-related remediation at Juan Cabrillo Elementary School Building F (PCB Workplan) for replacement of all window units in Classrooms 16 through 23 of Building F at the Juan Cabrillo Elementary School (JCES), located at 30237 Morning View Drive, Malibu, California. This project is being conducted as part of the District’s modernization plan for windows, paint, floors, and doors. This PCB Workplan is specific to the windows to be replaced in Building F at JCES and excludes all other areas. A site plan of JCES indicating the location of Building F is provided as **Figure 1**, and a detailed drawing of Building F is provided as **Figure 2**.

In July 2015, the United States Environmental Protection Agency (USEPA) issued a guidance document titled *PCBs in Building Materials—Questions & Answers* (USEPA 2015b). This document details frequently asked questions regarding PCBs in building materials. In response to a question regarding if PCB-containing building materials be removed during building repair and renovation activities, USEPA stated the following:

*Yes, EPA recommends that PCB-containing caulk and other PCB-containing building materials be removed during planned renovations and repairs (when replacing windows, doors, roofs, ventilation, etc.). Prior to removal, EPA recommends PCB testing for caulk and other building materials that are going to be removed to determine what protections are needed during removal and to determine proper disposal requirements. Where testing confirms the presence of PCBs at regulated levels in building materials, they must be disposed of in accordance with the PCB regulations at 40 CFR part 761, subpart D. **In lieu of testing, caulk and other potentially PCB- containing building materials that are part of building repair and renovation activities may be assumed to contain PCBs at regulated levels and disposed of in accordance with 40 CFR part 761, subpart D.***

[emphasis added]

As stated above, to conservatively address characterization of materials for disposal purposes, USEPA policy allows for suspect or assumed PCB-impacted building materials that are part of repair and renovations activities to be assumed to contain PCBs at regulated levels, even if they do not, and disposed of in accordance with 40 CFR part 761.

For cost savings purposes, and in compliance with USEPA policy, this PCB Workplan utilizes this simplifying disposal assumption in addressing the following two areas:

- 1) Rooms 18, 19, 22, and 23 – These rooms were previously identified and verified to contain ≥ 50 milligrams per kilogram (mg/kg) PCBs in window caulking (PCB-impacted media), which was subsequently removed and replaced in summer 2015, as described below. However, a limited volume of PCB remediation waste, consisting of adjacent porous substrate previously in contact with the ≥ 50 mg/kg PCB caulk is still present in these rooms. This remaining porous material was encapsulated in summer 2015 and these materials are currently being managed as PCB remediation

¹ As of May 1, 2015, ENVIRON International Corporation’s (ENVIRON’s) name has been changed to Ramboll Environ US Corporation (Ramboll Environ).

waste per USEPA approvals. This PCB remediation waste is now proposed for removal during window replacement activities. In addition, for cost savings purposes and in compliance with USEPA policy, it is assumed that the previously remediated window units will be disposed of in accordance with 40 CFR part 761.²

- 2) Rooms 16, 17, 20 and 21 – These rooms have not been tested for PCBs in window caulk but we understand that these windows have not previously been modernized since original installation. For the purposes of disposal given the age of these windows, the window units and any porous substrate in contact with the window caulk will be assumed to contain PCBs at regulated levels.³

This PCB Workplan was written in accordance with guidance from United States Environmental Protection Agency (USEPA) Region IX and the Toxic Substances Control Act (TSCA) 40 Code of Federal Regulations (CFR) 761.

Building materials surrounding the window units in Classrooms 16 through 23 of Building F will be remediated in accordance with the procedures in this PCB Workplan. Section 2 provides further details related to removing and disposing of PCB-impacted media from Building F at JCES based on current USEPA regulations and guidance.

This PCB Workplan provides a remedial approach that is consistent with the *Site-Specific PCB-Related Building Materials Management, Characterization and Remediation Plan for the Library and Building E Rooms 1, 5, and 8 at Malibu High School* (ENVIRON 2014a) as supplemented by *Supplemental Removal Information for the Library, Building E - Rooms 1, 5, and 8 and Building G - Room 506 at Malibu High School* (ENVIRON 2014b) that was approved by USEPA Region IX (USEPA 2014a).

Removal of PCB-impacted media in Classrooms 16 through 23 of Building F at JCES is anticipated to begin during the summer of 2016. As further described below, the District intends to conduct this remediation in accordance with 40 CFR 761.62 and 40 CFR 761.61(a) and (c).

This PCB Workplan will be implemented by the District as the owner and operator of the building. The District will contract a qualified remediation contractor to conduct the work detailed in this plan prior to the remediation. All PCB testing will be conducted by a qualified environmental consultant under contract to the District. The District's contact information is below:

Ms. Sandra Lyon, Superintendent
Santa Monica Malibu Unified School District
1651 Sixteenth Street
Santa Monica, CA 90404
310-450-8338 ext. 70229

1.2 Background Information

SMMUSD owns and operates JCES. According to available information, Building F of JCES was constructed in approximately 1961/1965 and the window units have not previously been replaced.

² https://www3.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/pdf/pcb_bdg_mat_qa.pdf

³ Ibid

1.2.1 Previous PCB Investigation/Remediation Work Completed

In July 2014, ENVIRON submitted to USEPA the *Site-Specific PCB-Related Building Materials Management, Characterization and Remediation Plan for the Library and Building E Rooms 1, 5, and 8 at Malibu High School* (ENVIRON 2014a), here-in known as the "Site-Specific Plan." In September 2014, ENVIRON submitted to USEPA a report titled *Supplemental Removal Information for the Library, Building E - Rooms 1, 5, and 8 and Building G - Room 506 at Malibu High School* (ENVIRON 2014b). USEPA approved both documents in October 2014 (USEPA 2014a) and form the basis for this PCB Workplan.

In March 2015, ENVIRON submitted to USEPA a *Notification of Additional Locations at Malibu High School and Juan Cabrillo Elementary School to be Addressed in Accordance with October 2014 USEPA Approved Plan* (ENVIRON 2015). As discussed in this letter, in February 2015 the District collected bulk samples of window caulking from four of the eight classrooms at JCES Building F (Rooms 18, 19, 22, and 23). The results of these samples indicated that the PCB concentration in the window caulking of the rooms tested was ≥ 50 mg/kg. Furthermore, the letter states, "These areas will be addressed in accordance with the approved methods in the October 2014 [USEPA] Approval."

In response to this finding, during the 2015 summer break, the District removed the window caulking from JCES Building F (Rooms 18, 19, 22, and 23), decontaminated surrounding nonporous building materials previously in contact with the caulk, and encapsulated porous building material previously in contact with the caulk (out to a distance of approximately 1 foot from the point of contact). The locations of encapsulated surfaces in Rooms 18, 19, 22, and 23 are provided on figures in **Appendix A**.

Following the remediation, the District conducted air and surface wipe sampling in JCES Building F (Rooms 18, 19, 22, and 23) to verify that postremediation PCB concentrations met USEPA's cleanup goals (i.e., 1 microgram per 100 cubic centimeters [$\mu\text{g}/100\text{cm}^2$] for surfaces and USEPA's Exposure Levels for Evaluation of PCBs in Indoor School Air for air [USEPA 2016]). The District's remediation efforts in JCES Building F are documented in Ramboll Environ's *Conclusion of PCB Sampling Pilot Study and 2015 PCB Removal Activities Report for Malibu High School and Juan Cabrillo Elementary School* (Ramboll Environ 2015), submitted to USEPA in October 2015.

On November 2, 2015, USEPA issued a letter to the District stating that "we have determined that the removal work, BMPs [best management practices], and air and wipe sampling were performed consistent with EPA's national guidelines to protect public health from PCBs in schools and the terms and conditions of the Approval. In addition, the Report describes the removal by the District of PCB containing fluorescent light ballasts and fixtures, and caulk known and verified to have PCB concentrations at ≥ 50 ppm. Finally, we find that the District has successfully treated the porous and non-porous substrates in contact with the caulk consistent with the requirements of the Approval" (USEPA 2015a). In addition, the USEPA stated that "PCB-contaminated porous substrates shall be removed or decontaminated down to 1 ppm when the specific area is renovated or demolished." This applies to where the District removed the window caulking from JCES Building F (Rooms 18, 19, 22, and 23) and encapsulated porous materials remain.

The PCB Workplan provides a consistent remedial approach approved by USEPA in October 2014 (USEPA 2014a). In addition, the PCB Workplan provides a consistent approach with the USEPA's November 2015 correspondence.

No testing for PCBs in window caulk has been conducted in Rooms 16, 17, 20 and 21. Given the windows in these rooms have not previously been modernized since original installation, this PCB Workplan addresses the window caulk in Rooms 16, 17, 20 and 21 per current USEPA policy on the potential for PCBs in building materials.⁴

1.2.2 Presence of Asbestos

In addition to potentially PCB-impacted building materials, based on information provided in the *Asbestos Survey Project Record, Juan Cabrillo Elementary School* (CTL 2007), and *AHERA Three-Year Inspection, Juan Cabrillo Elementary School* (Coffey 2010), the following building materials in Building F were found to contain >1% asbestos:

Asbestos Sampling Results – Building F

MATERIAL	SAMPLE NUMBER	MATERIAL LOCATION	ASBESTOS CONTENT
Sink undercoat	C2801-C2803	Under sinks of all classrooms	25%-30% chrysotile
Chalkboard mastic	Not sampled to avoid damage	All classrooms (did not sample to avoid damage)	Assumed
9" gray floor tile with white streaks and mastic	C0401	All classrooms except Room 19	5%-10% chrysotile
Exterior wall stucco	C0901-C0902	All exterior walls	2% chrysotile
Exterior ceiling stucco	C1001-CI 003	Exterior overhangs	2% chrysotile

In order to confirm the location of asbestos-containing materials with regards to flooring in Building F, it is understood by Ramboll Environ that an asbestos survey will be conducted by the District or its contractor in March 2016 and results will be available soon.

However, as the window replacement at JCES Building F will disturb building materials known to contain asbestos above the regulatory level of 1% (e.g., exterior wall stucco and exterior ceiling stucco), a site-specific asbestos removal workplan will be prepared by others and will be provided to the Contractor replacing the windows. Assessment, handling, and remediation/disposal of asbestos-containing materials are outside the scope of this document. Remediation procedures outlined in this PCB Workplan are specific to building materials that potentially contain PCBs only.

⁴ https://www3.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/pdf/pcb_bdg_mat_qa.pdf

2. ASSUMED PCB CONTAINING BUILDING MATERIAL REMOVAL/REMEDATION PROCEDURES

This PCB Workplan has been developed to establish procedures for removing, cleaning up, and disposing of media associated with replacing window units in Building F at JCES. This PCB Workplan provides a remedial approach consistent with the Site-Specific Plan (ENVIRON 2014a), approved by USEPA in October 2014 (USEPA 2014a).

Throughout implementation and upon its completion, each step of the remediation will be evaluated to determine whether any plan modifications should be made prior to continuing with the remediation in other areas. This section describes the proposed remedial activities anticipated to be implemented for each of the potentially affected building material media.

2.1 Summary of Remediation Plan

For cost savings purposes and in compliance with USEPA policy, it is assumed for the purposes of disposal that window units in Building F of JCES contain PCBs at regulated levels, even if they do not, and will be disposed of in accordance with 40 CFR part 761.⁵ To remediate potentially PCB-impacted building materials, the following activities are proposed:

Rooms 18, 19, 22, and 23 (Rooms where caulk was removed/replaced in summer 2015 and encapsulated porous materials remain)

- Remove the windows units. The window units will be disposed of as PCB Bulk Product Waste and California Non-Resource Conservation and Recovery Act (RCRA) Hazardous Waste;
- Remove up to 12 inches of porous building materials above, below, and to the sides of the windows where encapsulation was applied in summer 2015 (see figures in **Appendix A** for detailed locations). These removed materials will be disposed of as PCB Remediation Waste and California Non-RCRA Hazardous Waste;
- Either prior to removal of the window units, or immediately subsequent to removal of the window units and surrounding porous building materials previously in contact with caulk, confirmatory bulk sampling of the remaining porous substrate will be conducted to verify that the remediation goal of ≤ 1 mg/kg PCBs established by USEPA is achieved (See Section 2.8.1 for further details on the sampling procedure). If porous building materials previously in contact with the removed window caulk are > 1 mg/kg and cannot be removed (e.g., structural members), those porous materials will be encapsulated in accordance with the procedures outlined in Section 2.7.
- Upon completion of the tasks above, including decontamination of all surfaces within the remediation work area but before removal of any containment, confirmatory wipe sampling is proposed to verify that USEPA Region IX's surface concentration goal of ≤ 1 $\mu\text{g}/100$ cm^2 PCBs has been achieved within the containment area. See Section 2.8.3.2 for further details on the sampling procedure; and
- Lastly, after completion of the tasks above and removal of the containment, confirmatory postremoval surface wipe and indoor air sampling will be conducted to verify that surface wipe concentrations are below the USEPA Region IX's cleanup goal of ≤ 1 $\mu\text{g}/100$ cm^2 PCBs (including areas that were outside of the containment, as applicable) and air

⁵ https://www3.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/pdf/pcb_bdg_mat_qa.pdf

concentrations are below USEPA's Exposure Levels for Evaluation of PCBs in Indoor School Air (USEPA 2016). See Section 2.8.3.2 for further details on the wipe sampling procedures and Section 2.8.3.1 for further details on the air sampling procedure.

Rooms 16, 17, 20 and 21 (Rooms where PCB testing has not been conducted)

- Remove the windows units. Where window caulk was in contact with porous substrate (e.g., stucco, wood, etc.), remove the porous substrate above, below, and to the sides of the window caulk. The distance for removal of porous surfaces previously in contact with caulk in Rooms 16, 17, 20 and 21 will be based on the results of confirmatory bulk sampling in Rooms 18, 19, 22, and 23, as described in Section 2.8.1. If based on the results of sampling in Rooms 18, 19, 22, and 23, porous building materials that are inferred to be >1 mg/kg cannot be removed (e.g., structural members) in Rooms 16, 17, 20 and 21, those porous materials will be encapsulated in accordance with the procedures outlined in Section 2.7. Both the window units and the substrate previously in contact with caulk will be disposed as PCB Bulk Product Waste and California Non-RCRA Hazardous Waste;
- Upon completion of the tasks above, including decontamination of all surfaces within the remediation work area but before removal of any containment, confirmatory wipe sampling will be conducted to verify that the USEPA Region IX's surface concentration goal of $\leq 1 \mu\text{g}/100 \text{ cm}^2$ PCBs has been achieved within the containment area. See Section 2.8.3.2 for further details on the sampling procedure; and
- Lastly, after completion of the tasks above and removal of the containment, confirmatory postremoval surface wipe and indoor air sampling will be conducted to verify that the surface wipe concentrations are below the USEPA Region IX's cleanup goal of $\leq 1 \mu\text{g}/100 \text{ cm}^2$ PCBs (including areas that were outside of the containment, as applicable) and air concentrations are below USEPA's Exposure Levels for Evaluation of PCBs in Indoor School Air (USEPA 2016). See Section 2.8.3.2 for further details on the wipe sampling procedures and Section 2.8.3.1 for further details on the air sampling procedure.

We understand that the window removal remediation contractor has not yet been selected by SMMUSD. For the purposes of this PCB Workplan, we will refer to the remediation contractor as "the Contractor". The Contractor will be performing all the activities described in the remainder of this section unless specified otherwise below.

2.2 Remediation Goals

The remediation plan proposed herein is a combination of removal and off-site disposal of PCB Bulk Product Waste under 40 CFR 761.62 with a self-implementing remediation and disposal of PCB Remediation Waste under 40 CFR 761.61(a) and (c).

The remediation goals for the project are shown below:

- Total PCBs in porous substrate adjacent to window caulk: $\leq 1 \text{ mg/kg}$
- Total PCBs in confirmatory surface wipe samples: $\leq 1 \mu\text{g}/100 \text{ cm}^2$
- Total PCBs in indoor air: below USEPA's Exposure Levels for Evaluation of PCBs in Indoor School Air (USEPA 2016), which is <200 nanograms per cubic meter (ng/m^3) for children 3 to <6 years, <300 ng/m^3 for children 6 to <12 years, <500 ng/m^3 for children 12 to <15 years, <600 ng/m^3 for children 15 to <19 years, and <500 ng/m^3 for adults 19 years or older.

2.3 Engineering Controls to be Established by Contractor

Prior to implementing removal or remediation procedures, engineering controls will be put in place by the Contractor to prevent the migration of potentially PCB-impacted materials and/or other known hazards (i.e., asbestos-containing materials) from work areas.

Engineering controls required for potential PCB-impacted materials will include using polyethylene sheeting to control and catch debris, wetting material prior to handling, and implementing work practices to minimize dust generation. However, the Contractor should refer to the site-specific asbestos removal workplan if other engineering controls will be required for asbestos.

An integral step in implementing protective measures is to assign a containment area for each distinct abatement area. The containment area size and construction will be proportionate to the activities that will be conducted (i.e., amount of dust generation expected). Containment structures will be constructed by the Contractor within the containment area at each location where abatement is performed and in a manner that minimizes airborne dust from spreading outside the abatement area. For example, a containment structure can be constructed of poly sheeting draped over existing building features and/or support frames built specifically for the containment area. The containment area will be maintained by the Contractor under negative air pressure by installing an induced draft fan equipped with high-efficiency particulate air (HEPA) filters to minimize dust particles from being carried out of the containment area. The filtered exhaust from the fan will be routed outside the containment area and vented outside of the building.

Dust monitoring immediately outside the containment structures will be conducted by the Contractor. All tools will also be equipped with appropriate tool guards and dust/debris collection systems with HEPA filters. Specific engineering controls for dust monitoring are described in more detail in Section 2.4.

2.4 Air Monitoring Conducted by Contractor

The Contractor will be responsible for the health and safety of its workers and selection of appropriate personal protective equipment (PPE). If the area has also been identified for asbestos removal work, the Contractor should also refer to the site-specific asbestos removal workplan for further details on air monitoring. The air monitoring described in this section is designed to evaluate any impacts to areas outside of the work areas under containment and to trigger appropriate additional actions if remedial activities result in unacceptable impacts to these areas. The Contractor is responsible for determining if additional monitoring would be needed for their workers inside the contained work area.

Air monitoring stations will be established by the Contractor at the perimeter of the designated work area (outside containments). Air monitoring will be conducted by the Contractor at all times during PCB remediation activities, and air monitoring data will be reviewed by the Contractor a minimum of once per hour while work is in progress. The logged data will be downloaded and reviewed daily by the Contractor, so that changes to the work practices can be recommended based on observable trends in airborne dust concentration. Air monitoring equipment will be calibrated by the Contractor according to manufacturer's specifications.

To verify the effectiveness of dust-minimization engineering controls, air monitoring for respirable airborne particulates will be conducted by the Contractor using data-logging, real time monitors. The following California Division of Occupational Safety and Health

(Cal/OSHA) permissible exposure limits (PELs), based on an 8-hour, time-weighted average (8-hour TWA) will be considered applicable to this work:

- Total Dust: 10 milligrams per cubic meter (mg/m³)
- Respirable Fraction: 5 mg/m³
- PCBs (Aroclor 1242): 1 mg/m³
- PCBs (Aroclor 1254): 0.5 mg/m³

A total airborne particulate action limit has been established for the PCB remediation work to be conducted at the site with consideration of the specific receptors, PCB concentrations, work activities, and Cal/OSHA PELs. The action limit applies only to air monitoring at the perimeter of the work zone (outside containments).

An action limit of 0.1 mg/m³ total dust above background (an order of magnitude below the Cal/OSHA 8-hour TWA) will be maintained during site work at the perimeter of the work zone (outside containments). Air monitoring at a location representative of background air conditions (i.e., an area outside of the containment engineering controls) will be conducted by the Contractor at the same frequency as the monitoring to obtain data representative of real-time background conditions. The action limit will be used to determine if and when additional engineering controls and/or work stoppages would be necessary.

Should the action level be exceeded during remediation, remediation activities shall cease until work practices can be evaluated and adjusted. Ramboll Environ and the Contractor will then evaluate work procedures and recommend additional engineering controls or modified work practices to control dust generation. Any recommended changes to work practices will be documented. It is noted that the Cal/OSHA standards are based on an 8-hour TWA. Therefore, instantaneous exceedances of the action level and/or the standards listed above will not necessarily indicate an exceedance of the PEL.

2.5 Summary of Remediation Procedures to be Performed by Contractor

2.5.1 Rooms 18, 19, 22 and 23

Window units in Rooms 18, 19, 22, and 23 of Building F (Rooms with caulk removed/replaced in summer 2015) will be removed and transported for off-site disposal.

- Surface preparation for building material removal by the Contractor will include surficial wetting of visibly dry and/or deteriorating material to minimize dust generation.
- Polyethylene sheeting will be placed on the ground surface and building materials will be removed by the Contractor using hand tools to achieve removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from caulking or adjacent materials.
- The window units should be removed and segregated by the Contractor for disposal as both PCB Bulk Product Waste and California Non-RCRA Hazardous Waste.
- Porous substrate previously in contact with the ≥ 50 mg/kg PCB window caulk, which was encapsulated in summer 2015 (see figures in **Appendix A** for detailed locations), will be removed. The distance for removal (anticipated to be up to 12 inches) will be based on the results of confirmatory bulk sampling of the remaining porous substrate to verify that the remediation goal of ≤ 1 mg/kg PCBs established by USEPA is achieved (see Section 2.8.1). If porous building materials are > 1 mg/kg and cannot be removed (e.g., structural members), those porous materials will be encapsulated in accordance with the

procedures outlined in Section 2.7. These removed materials will be disposed of as PCB Remediation Waste and California Non-RCRA Hazardous Waste.

- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed by the Contractor at the completion of the work activity.
- During the project, equipment and tools used in the removal will be decontaminated by the Contractor through spraying and wet wiping. At the completion of the project, any nondisposable equipment and tools that came in contact with potentially PCB-impacted material will be decontaminated by the Contractor following the procedures described in 40 CFR 761.79.
- All removed materials will be stored by the Contractor on-site in lined, marked, and covered roll-off containers or Department of Transportation (DOT) 55-gallon drums prior to off-site disposal as either 1) PCB Remediation Waste and California Non-RCRA Hazardous Waste, or 2) PCB Bulk Product Waste and California Non-RCRA Hazardous Waste. The storage location will be identified in consultation with the District. Storage containers will be secured and/or locked each evening prior to demobilization to avoid unauthorized access.

2.5.2 Rooms 16, 17, 20 and 21

Window units in Rooms 16, 17, 20 and 21 (Rooms where PCB testing has not been conducted) will be removed and transported for off-site disposal.

- Surface preparation for building material removal by the Contractor will include surficial wetting of visibly dry and/or deteriorating material to minimize dust generation.
- Polyethylene sheeting will be placed on the ground surface and building materials will be removed by the Contractor using hand tools to achieve removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from caulking or adjacent materials.
- The window units will be removed and segregated by the Contractor for disposal as PCB Bulk Product Waste and California Non-RCRA Hazardous Waste;
- Where window caulk is currently in contact with porous substrate (e.g., stucco, wood, etc.), the porous substrate above, below, and to the sides of the window caulk will be removed. The distance for removal of porous surfaces in contact with caulk in Rooms 16, 17, 20 and 21 will be based on the results of confirmatory bulk sampling in Rooms 18, 19, 22, and 23, as described in Section 2.8.1. If based on the results of sampling in Rooms 18, 19, 22, and 23, porous building materials that are inferred to be >1 mg/kg cannot be removed (e.g., structural members) in Rooms 16, 17, 20 and 21, those porous materials will be encapsulated in accordance with the procedures outlined in Section 2.7. The porous substrate previously in contact with caulk will be disposed of as PCB Bulk Product Waste and California Non-RCRA Hazardous Waste;
- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed by the Contractor at the completion of the work activity.
- During the project, equipment and tools used in the removal will be decontaminated by the Contractor through spraying and wet wiping. At the completion of the project, any nondisposable equipment and tools that came in contact with potentially PCB-impacted material will be decontaminated by the Contractor following the procedures described in 40 CFR 761.79.

- All removed materials will be stored by the Contractor on-site in lined, marked, and covered roll-off containers or DOT 55-gallon drums prior to off-site disposal as both PCB Bulk Product Waste and California Non-RCRA Hazardous Waste. The storage location will be identified in consultation with the District. Storage containers will be secured and/or locked each evening prior to demobilization to avoid unauthorized access.

2.6 Proposed Contractor Procedures for Decontamination of Substrate in Contact with Materials Assumed to Contain PCBs at Regulated Levels (if necessary)

Although nonporous surfaces are not expected to be decontaminated as part of the remediation procedures described above, procedures for decontamination are provided below as a contingency. The task described below includes decontamination of nonporous materials adjacent to materials assumed to contain PCBs at regulated levels.

- When possible, all nonporous materials to be decontaminated will be disassembled and transported to a secure decontamination area and staged on polyethylene sheeting. If the material cannot be easily removed, the decontamination area will be lined with polyethylene sheeting in a manner designed to contain all liquids generated from the decontamination process.
- Material will be decontaminated by the Contractor via chemical washing with a chemical extraction solvent following the manufacturer's recommended procedures for hand applications. The product will be applied and scrubbed using hand brushes. During the agitation, the surface of the material will be kept wet with the chemical extraction solvent at all times. Following the five-minute dwell time, all free liquid will be vacuumed from the surface. A layer of rinse water will be applied to the material and then vacuumed. This procedure will be repeated three times followed by a triple water rinse after the final application.
- Ramboll Environ will then collect surface wipe samples in accordance with the standard wipe test as defined in 40 CFR 761.123.

2.7 Proposed Contractor Procedures for Encapsulation of Adjacent Porous Substrate in Contact with Materials Assumed to Contain PCBs at Regulated Levels (if necessary)

Although encapsulation is not expected to be necessary as part of the remediation procedures described above, procedures for encapsulation are provided below as a contingency.

Given the limitations of certain structures, extensive building material removal may not be a feasible remedial alternative. In this case, porous building materials may be encapsulated and left in place in accordance with the procedure below.

After removal of window caulk, the porous surface that cannot feasibly be removed and could contain >1 mg/kg PCBs must be prepared for repainting. Surfaces will be prepared by applying a leveling base (if needed), washing, and cleaning with a wire brush (or equivalent).

The porous materials in former direct contact with the window caulk (verified to contain ≥ 50 mg/kg) will be encapsulated with two coats of an epoxy coating. Each coat of the epoxy

coating should have a different color, which allows inspectors in the future to determine if the top coating is deteriorating or wearing thin.

Encapsulation mitigates both the potential for PCB transfer via direct contact and the potential for PCBs to migrate to surrounding media/materials. Selection of the encapsulant and development of a periodic monitoring plan, including surface wipe samples, will be implemented in consultation with USEPA to assess potential PCB concentrations on the exposed outer surfaces.

The following describes the proposed remedial activities for the porous surfaces that will not be removed:

- Prior to applying the encapsulant, all surfaces will be prepared so that they are dry, clean, and sound (as described above).
- The porous substrate in former direct contact with the window caulk (assumed to contain PCBs at regulated levels) will be encapsulated up to 1 foot away from the caulking/substrate contact.
- Per discussions with USEPA Region IX, a non-volatile organic compound epoxy-based encapsulant will be used (USEPA 2012), such as Sikagard® 62. The Contractor should follow the manufacturer's instructions for encapsulant mixing, application, and storage.
- Two coats of the epoxy will be applied. Each coat should be a contrasting color. Typically, the second coat of encapsulant must be applied 4 hours after the first coat, but no longer than 48 hours after the first coat. The Contractor should consult the encapsulant manufacturer for application instructions.
- Surface wipe sampling will be used to assess the effectiveness of the encapsulant. During future renovations or demolition of encapsulated porous substrates, further characterization testing of the porous substrate would be done to determine the extent of substrate to be removed and appropriate waste handling requirements for this material.

All generated waste material (PPE, application tools, etc.) will be containerized in an appropriate waste container for subsequent off-site disposal. This waste will be disposed of as PCB Remediation Waste and California Non-RCRA Hazardous Waste.

2.8 Confirmatory Sampling Program Conducted by Ramboll Environ

Analytical results from the verification samples will be evaluated to determine whether or not this task is complete as follows:

2.8.1 Porous Building Materials (e.g. wood, concrete, brick)

Verification sampling of the underlying building materials beyond the extent of removal will be conducted in Rooms 18, 19, 22, and 23.

For window units in Rooms 18, 19, 22, and 23 of Building F (Rooms with caulk removed/replaced in summer 2015), either prior to removal of the window units, or immediately subsequent to the removal of the window units and adjacent porous building materials previously in contact with the ≥ 50 mg/kg PCB caulk, confirmatory bulk sampling of the remaining adjacent porous substrate will be conducted by Ramboll Environ. The distance for removal of adjacent porous building materials (anticipated to be up to 12 inches) will be based on the results of confirmatory bulk sampling of the remaining porous substrate to

verify that the remediation goal of ≤ 1 mg/kg PCBs established by USEPA is achieved. Bulk samples will be collected in accordance with the *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs)* (USEPA 2011). All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

If analytical results are ≤ 1 mg/kg for total PCBs, the remedial goal has been met. No additional removal will be required and/or no PCB disposal restrictions will apply to the underlying or adjacent materials.

If analytical results are > 1 mg/kg for total PCBs, the remedial goal has not been met and the distance for removal of adjacent porous building materials will need to be extended. Additional removal and off-site disposal will be conducted by the Contractor and the sampling process will be repeated until the cleanup level of ≤ 1 mg/kg is met.

2.8.2 Nonporous Building Materials (if needed)

Although nonporous surfaces are not expected to be decontaminated as part of the remediation procedures described above, procedures for decontamination are provided above in Section 2.6 as a contingency.

For nonporous surfaces that are decontaminated, Ramboll Environ will collect surface wipe samples in accordance with the standard wipe test (40 CFR 761.123) from locations on the material formerly in contact with the potentially PCB-impacted waste. If results indicate that the PCB concentration is less than the USEPA Region IX's cleanup goal of < 1 $\mu\text{g}/100\text{cm}^2$, then no additional cleanup is required. If a verification sample is reported with PCB concentrations > 1 $\mu\text{g}/100\text{cm}^2$, this surface will be cleaned again. All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

2.8.3 Postremediation Confirmatory Air and Wipe Samples

After potentially PCB impacted building materials have been removed (or encapsulated, if necessary), but before containment is removed, Ramboll Environ will collect surface wipe samples near building materials that were remediated and on encapsulated surfaces (if encapsulation is required). Once those surface wipe samples meet USEPA Region IX's cleanup goal of < 1 $\mu\text{g}/100\text{cm}^2$, the Contractor will remove the containment and Ramboll Environ will collect surface wipe samples (including areas that were not inside of containment during remediation) as well as air samples in the remediated rooms. The following procedures will be followed during collection of air and surface wipe samples.

2.8.3.1 Air Sampling

Ramboll Environ will collect air samples using the procedures previously approved by USEPA on October 31, 2014 (USEPA 2014a), and outlined in the Site-Specific Plan (ENVIRON 2014a).

Each air sample will be collected on a polyurethane foam cartridge at a constant flowrate of approximately 5 liters per minute (L/min) for a period of 24 hours with the lights on, windows closed, and heating, ventilation, and air conditioning (HVAC) turned off. These conditions represent conditions that would maximize potential airborne concentrations as compared to normal occupancy conditions; thus these conditions represent conservative worst-case exposure potentials (i.e., concentrations during routine operations in these rooms are expected to be lower).

The air samples will be collected without a pre-filter and will be analyzed for Aroclors using USEPA Method TO-10A, which is approved by USEPA in its January 27, 2014, letter to the SMMUSD (USEPA 2014b).

Air samples will be sealed, labeled, wrapped in foil, and packed on ice in a sealed cooler at the end of the sampling and picked up by courier under chain-of-custody procedures for delivery to the analytical laboratory for PCB analysis.

The cleanup goals for air sampling correspond to USEPA's Exposure Levels for Evaluation of PCBs in Indoor School Air (USEPA 2016), which are <200 ng/m³ for children 3 to <6 years, <300 ng/m³ for children 6 to <12 years, <500 ng/m³ for children 12 to <15 years, <600 ng/m³ for children 15 to <19 years, and <500 ng/m³ for adults 19 years or older.

2.8.3.2 Wipe Sampling

Wipe samples will be collected on gauze pads using the Standard Wipe Test described in 40 CFR 761.123, which specifies a collection surface area of 100 cm². As discussed in Appendix D of the Site-Specific Plan (ENVIRON 2014a), gauze pads for surface wipe samples will be wetted with high-performance liquid chromatography (HPLC) grade 2-propanol (isopropanol) for caulking (including glazing and sealant) (if applicable), and hexane for all other surfaces. Samples will be labeled, sealed, placed in closed containers, and sent under chain-of-custody procedures to the analytical laboratory.

All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

Postremediation surface wipe samples will be collected before containment is removed and near building materials that were remediated, as well as on encapsulated surfaces (if encapsulation is required). Once those samples meet USEPA's cleanup goal of <1 µg/100cm² and containment has been removed, another round of surface wipe samples will be collected (including areas not inside of the previous containment area).

As directed by USEPA Region IX, a comparison threshold of 1 µg/100 cm² will be used for wipe samples taken at JCES. If results are greater than this threshold, additional cleaning will be conducted and an additional round of wipe samples will be collected.

2.9 Contingency Plan

If wider distributions of potential PCB-containing building materials are found, or other obstacles force changes in the remediation approach, remediation contingencies will be developed in consultation with Ramboll Environ and the District prior to implementation.

2.10 Data Validation

A data quality and data usability assessment of all samples collected by Ramboll Environ will be completed. The data review will be conducted by Ramboll Environ in accordance with USEPA protocols. This review will include a completeness check of field documentation including sample collection and preservation methods, a completeness check of the laboratory data and documentation, a review of the internal laboratory quality assurance/quality control procedures and results including surrogate recoveries, the matrix spike/matrix spike duplicate results, blank results, laboratory control standard results, an evaluation of sample holding times, and field duplicate results. Upon receiving the data validation summaries, any qualifiers applied to the data will be added to the data summary tables presented in the final report.

2.11 Waste Management and Disposal

Waste management and disposal includes on-site handling, accumulation, containerizing, labeling, and off-site transporting (including providing and preparing manifests, bills of lading, etc.) and disposing of PCB waste streams. The PCB waste streams will be transported via a licensed waste hauler to a permitted hazardous waste disposal facility as outlined below.

Secure, lined, and covered waste containers (roll-off containers or equivalent) or 55-gallon DOT-approved steel containers will be staged to collect PCB wastes generated during the work activities in accordance with applicable requirements in 40 CFR 761.65 and 40 CFR 761, Subpart K. All containers will be properly labeled and marked in accordance with 40 CFR 761.40 and 22 CCR 66262.34. The storage location will be identified in consultation with the District. All storage containers will be secured and/or locked each evening prior to demobilization to avoid unauthorized access.

Upon completion of waste profiling and acceptance at the respective facilities, all PCB waste will be transported off-site for disposal under a manifest to a disposal facility in accordance with 40 CFR 761.62 and 22 CCR 66262.23.

Water generated by the Contractor during decontamination (or as part of dust suppression) that is collected on polyethylene sheeting will be contained on site in 55-gallon drums, sampled for PCBs and other potential constituents, and designated for off-site disposal in accordance with 40 CFR 761.79 and/or California hazardous waste regulations, as applicable.

Polyethylene sheeting, PPE, and nonliquid cleaning materials will be managed and disposed of off-site in accordance with 40 CFR 761.61(a)(5)(v).

2.12 Recordkeeping and Documentation

Following completion of the work activities, applicable records and documents per 40 CFR 761 will be generated and maintained at one location. Ramboll Environ will prepare a remediation report which will contain a detailed description of remediation activities along with photographs documenting the completion of work. In addition, the report will include volumes of disposed materials and all waste disposal records as provided by the Contractor. The remediation report will be prepared to provide an accounting of activities performed and documentation necessary to support the conclusion that the remedial activities met the objectives of the project. Upon completion, the remediation report will be submitted to USEPA Region IX to inform them of the completion of remedial activities in Rooms 18, 19, 22, and 23 of Building F.

The final remediation report will also be available to the public upon request.

2.13 Certification

As required by 40 CFR 761.61(a)(3)(i)(E), written certification was provided in the Site-Specific Plan (ENVIRON 2014a). This certification was signed by both the owner of the property where the remediation site is located, and the party responsible for conducting the remediation and states that all sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the remediation site, are on file at the location designated in the certificate, and are available for USEPA inspection.

3. REFERENCES

- Coffey Environments (Coffey). 2010. AHERA Three-Year Inspection, Juan Cabrillo Elementary School. May 17.
- CTL. 2007. Asbestos Survey Project Record, Juan Cabrillo Elementary School. March 20.
- ENVIRON. 2014a. Site-Specific PCB-Related Building Materials Management, Characterization and Remediation Plan for the Library and Building E Rooms 1, 5, and 8 at Malibu High School. July 3. Available online: <http://www.smmusd.org/PublicNotices/PCBRemediationPlan070314.pdf>.
- ENVIRON. 2014b. Supplemental Removal Information for the Library, Building E - Rooms 1, 5, and 8 and Building G - Room 506 at Malibu High School. September 26. Available online: <http://smmusd.org/PublicNotices/MHSSupRemovalSSP092614.pdf>.
- ENVIRON. 2015. Notification of Additional Locations at Malibu High School and Juan Cabrillo Elementary School to be Addressed in Accordance with October 2014 USEPA Approved Plan. March. Available online: http://www.smmusd.org/PublicNotices/EnvDocs/ENVIRONtoUSEPA_032015.pdf
- Ramboll Environ. 2015. Conclusion of PCB Sampling Pilot Study and 2015 PCB Removal Activities Report for Malibu High School and Juan Cabrillo Elementary School. October. Available online: <http://www.smmusd.org/publicnotices/EnvDocs/Summer15SMM-PCBSampReport.pdf>
- USEPA. 2016. Exposure Levels for Evaluation of PCBs in Indoor School Air. Available online: https://www3.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/exposure_levels.htm.
- USEPA. 2015a. Letter from Jeff Scott/USEPA to Sandra Lyon/SMMUSD. November 2. Available online: <http://www.smmusd.org/publicnotices/MalibuSupplementalApproval.pdf>
- USEPA. 2015b. PCBs in Building Materials—Questions & Answers. July 28. Available online: https://www3.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/pdf/pcb_bdg_mat_qa.pdf
- USEPA. 2014a. Letter from Jared Blumenfeld/USEPA to Sandra Lyon/SMMUSD. October 31. Available online: http://www.smmusd.org/PublicNotices/EnvDocs/EPAtoSL_103114.pdf
- USEPA. 2014b. Letter from Steve Armann/USEPA to Sandra Lyon/SMMUSD. January 27. Available online: <http://www.smmusd.org/PublicNotices/EPALetterToSL012714.pdf>
- USEPA. 2012. Laboratory Study of Polychlorinated Biphenyl (PCB) Contamination and Mitigation in Buildings. Part 3, Evaluation of the Encapsulation Method. April. EPA/600/R-11/156B.
- USEPA. 2011. Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls. May.

FIGURES



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RAMBOLL ENVIRON

DRAFTED BY: RRH Date: 3/9/2016

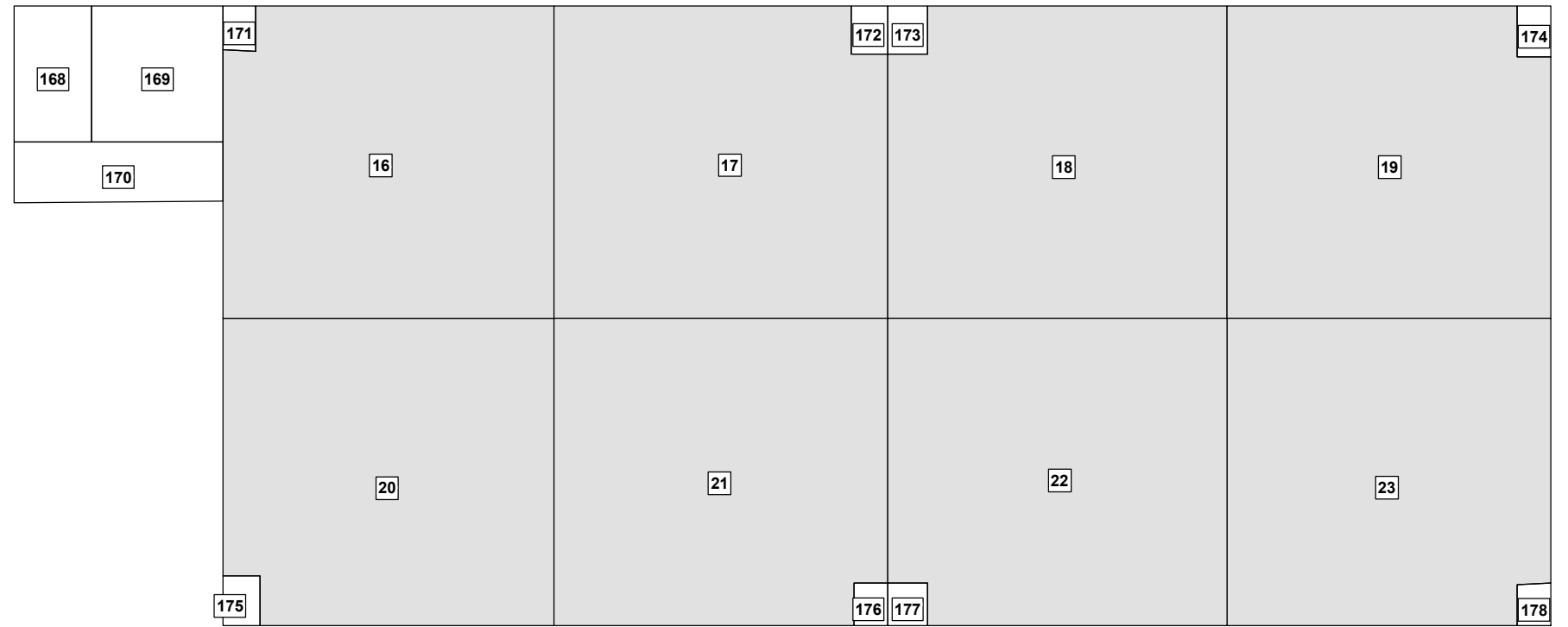
Site Plan

Juan Cabrillo Elementary School
30237 Morning View Drive, Malibu, California

Figure
1

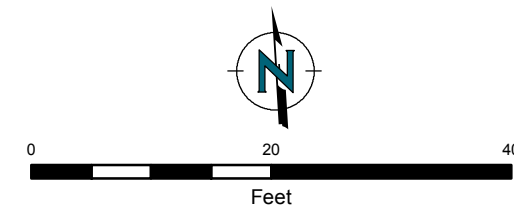
PROJECT: 0433980U

Floor Plan Room ID	Placard Room ID	Description
16	R16	Special education student occupational therapy room
17	R17	Computer room
18	R18	PTA room
19	R19	Music room
20	R20	Science laboratory
21	R21	Special education classroom
22	R22	Art classroom
23	R23	Overflow room/music room
168	168	Storage room / office
169	169	Storage room
170	170	Storage room
171	171	Heater room
172	172	Heater room
173	173	Heater room
174	174	Heater room
175	175	Heater room
176	176	Heater room
177	177	Heater room
178	178	Heater room



Notes:

1. Floor Plan Room ID is shown for each room.
2. Regularly occupied indicates that the room is typically occupied by an individual on a daily basis (excluding weekends) for at least 4 hours per day.
3. Abbreviations:
JCES = Juan Cabrillo Elementary School
4. Floor plan reference: JE Jacobs (2001)
5. Figure dimensions are approximate.



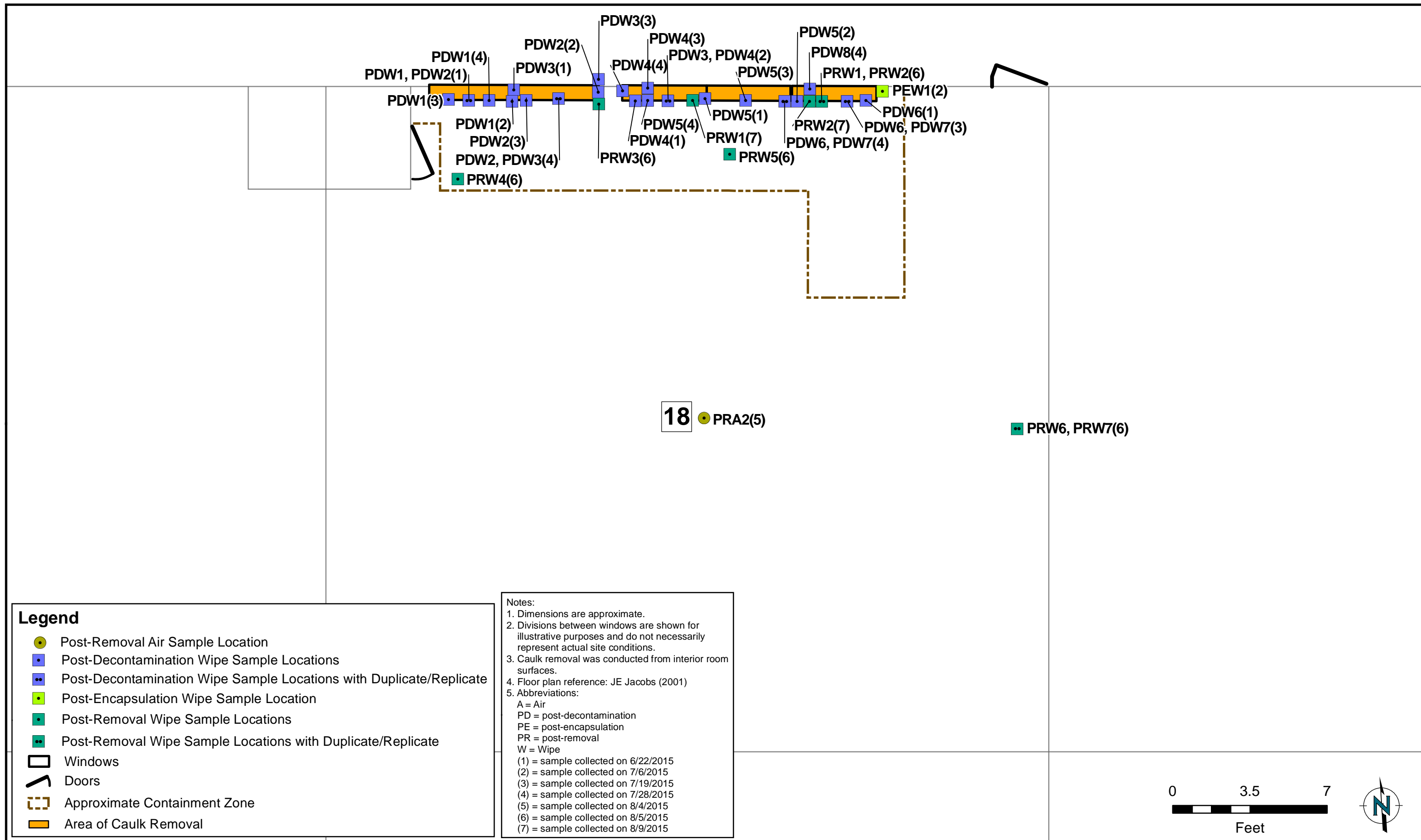
Legend
 Regularly Occupied Rooms

Detail of Building F

Juan Cabrillo Elementary School
30237 Morning View Drive, Malibu, California

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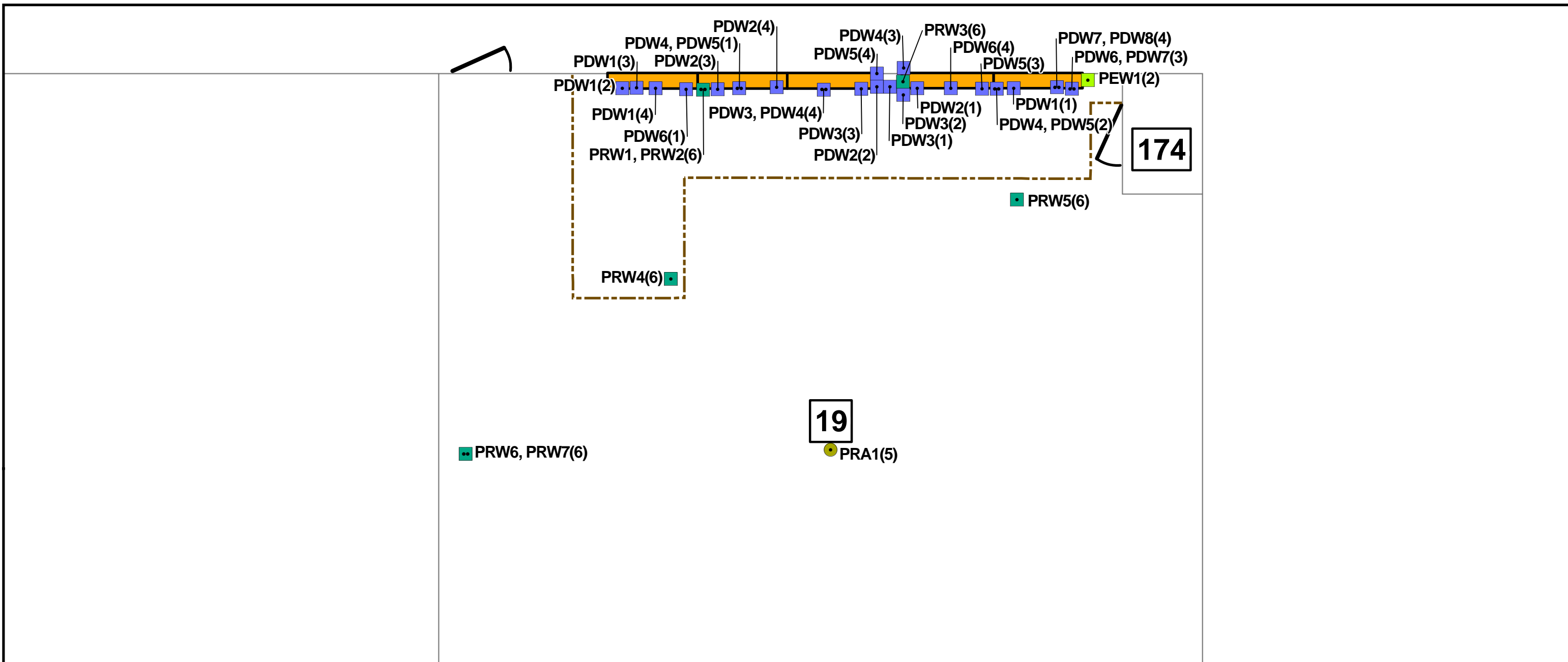
**APPENDIX A
LOCATIONS OF CAULK REMOVAL AND
AREAS OF ENCAPSULATION IN ROOMS
18, 19, 22 AND 23**



Location of Interior Window Caulk Removal, Air Sampling, and Surface Wipe Sampling in Room 18 Building F at JCES - Summer 2015

Juan Cabrillo Elementary School
 30237 Morning View Drive, Malibu, California

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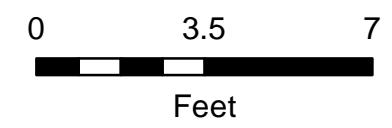


Legend

- Post-Removal Air Sample Location
- Post-Decontamination Wipe Sample Locations
- Post-Decontamination Wipe Sample Locations with Duplicate/Replicate
- Post-Encapsulation Wipe Sample Location
- Post-Removal Wipe Sample Locations
- Post-Removal Wipe Sample Locations with Duplicate/Replicate
- Windows
- Doors
- Approximate Containment Zone
- Area of Caulk Removal

Notes:

1. Dimensions are approximate.
2. Divisions between windows are shown for illustrative purposes and do not necessarily represent actual site conditions.
3. Caulk removal was conducted from interior room surfaces.
4. Floor plan reference: JE Jacobs (2001)
5. Abbreviations:
 A = Air
 PD = post-decontamination
 PE = post-encapsulation
 PR = post-removal
 W = Wipe
 (1) = sample collected on 6/22/2015
 (2) = sample collected on 7/6/2015
 (3) = sample collected on 7/19/2015
 (4) = sample collected on 7/28/2015
 (5) = sample collected on 8/4/2015
 (6) = sample collected on 8/5/2015



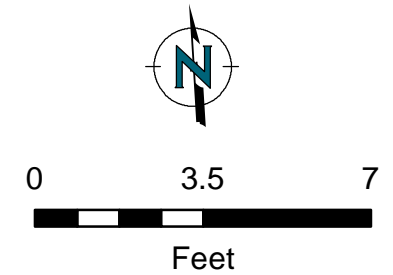
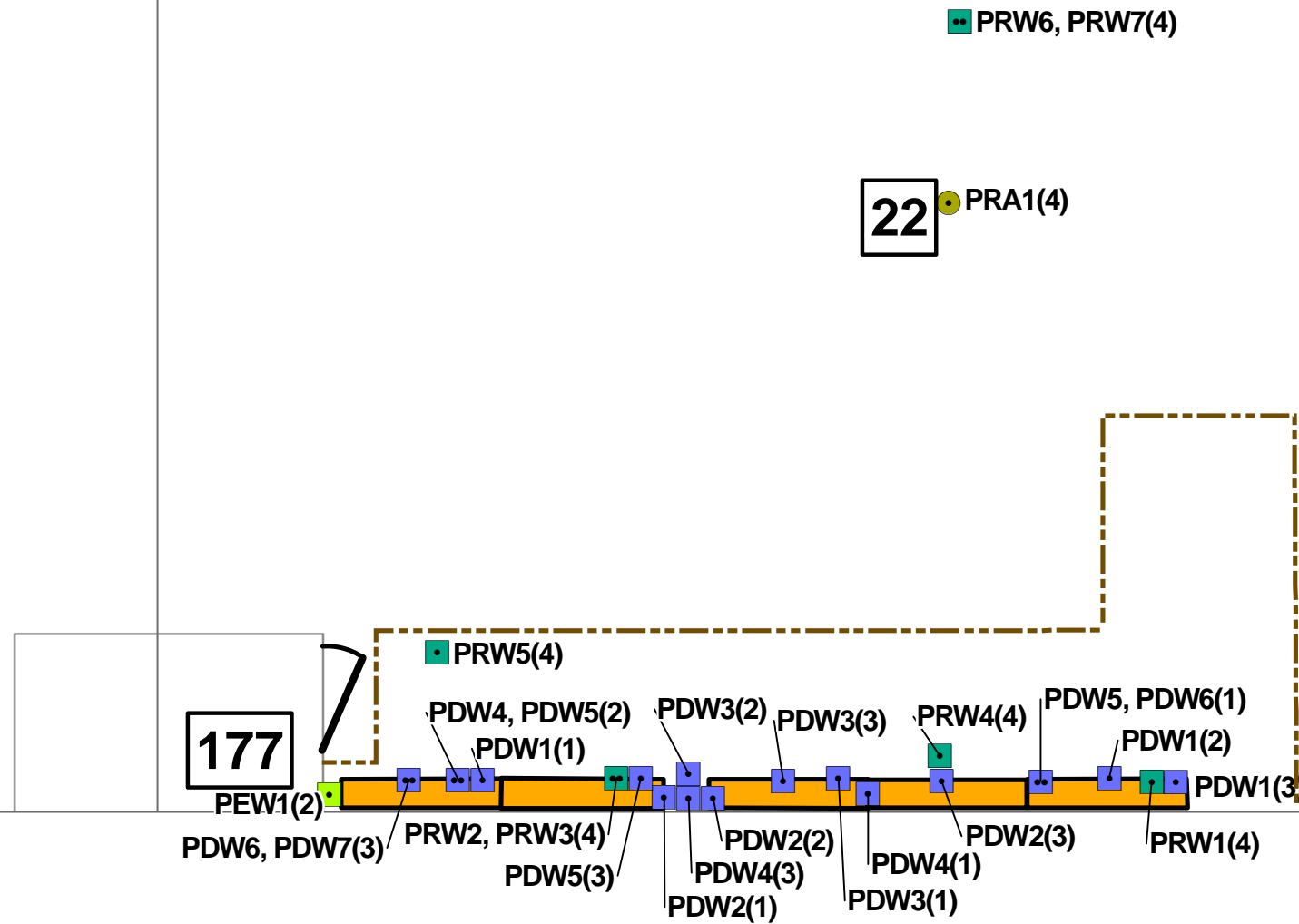
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Legend

- Post-Removal Air Sample Location
- Post-Decontamination Wipe Sample Locations
- Post-Decontamination Wipe Sample Locations with Duplicate/Replicate
- Post-Encapsulation Wipe Sample Location
- Post-Removal Wipe Sample Locations
- Post-Removal Wipe Sample Locations with Duplicate/Replicate
- Windows
- Doors
- Approximate Containment Zone
- Area of Caulk Removal

Notes:

1. Dimensions are approximate.
2. Divisions between windows are shown for illustrative purposes and do not necessarily represent actual site conditions.
3. Caulk removal was conducted from interior room surfaces.
4. Floor plan reference: JE Jacobs (2001)
5. Abbreviations:
 A = Air
 PD = post-decontamination
 PE = post-encapsulation
 PR = post-removal
 W = Wipe
 (1) = sample collected on 6/22/2015
 (2) = sample collected on 7/6/2015
 (3) = sample collected on 7/19/2015
 (4) = sample collected on 7/28/2015



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Legend

- Post-Removal Air Sample Location with Duplicate/Replicate
- Post-Decontamination Wipe Sample Locations
- Post-Decontamination Wipe Sample Locations with Duplicate/Replicate
- Post-Encapsulation Wipe Sample Location
- Post-Removal Wipe Sample Locations
- Post-Removal Wipe Sample Locations with Duplicate/Replicate
- Windows
- Doors
- Approximate Containment Zone
- Area of Caulk Removal

Notes:

1. Dimensions are approximate.
2. Divisions between windows are shown for illustrative purposes and do not necessarily represent actual site conditions.
3. Caulk removal was conducted from interior room surfaces.
4. Floor plan reference: JE Jacobs (2001)
5. Abbreviations:
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 (2) = sample collected on 7/6/2015
 (3) = sample collected on 7/19/2015
 (4) = sample collected on 7/28/2015

