



Industrial Hygiene Work Plan for  
**Board of Equalization Building,**  
**450 N Street Sacramento CA**  
Pipe Corrosion Investigation  
Project

Project #: 8410430.11



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## Attachment

- A Pipe Investigation Plans



# 1. GENERAL

## 1.1 Project Description

Pipe Corrosion investigation is required at The Board of Equalization Building (BOE). Current drainage issues require investigation at multiple locations above ceilings and possibly within suspect core wall areas. To support pipe testing and investigation; this work plan is designed to provide procedures to control dust and debris created during the investigation work as well as potential mold related work at 450 N Street Sacramento, California.

## 1.2 Building Description

- 23 floors (plus Penthouse)
- Approximately 25,000 square feet (sf) per floor
- Built in 1990-1992
- Occupied by the State Board of Equalization and other tenants
- 2 break room sinks per floor is common, however a few floors have 3, a few floors have 1, and the 23<sup>rd</sup> floor has 13 sinks
- There are 55 sinks served by approximately 1,900 feet (ft) of gray cast iron pipe with no-hub fittings. Pipe size is primarily 2-inch in tenant areas, connecting to 4-inch size in core areas, and stacks are 6-inch size.

# 2. SCOPE OF WORK

The clean-up assist work includes the setup, cleaning, and decontamination necessary to support pipe testing and investigation work; this work plan is designed to provide procedures to control dust and debris created during the investigation work as well as potential mold related work. Mold clean-up assist support will be provided by Allied Environmental (Environmental Contractor).

Environmental Contractor shall furnish all labor and materials for effective setup and cleaning.

All work shall be supervised by experienced persons trained, knowledgeable and qualified in the techniques of mold remediation, safe handling and disposal requirements, and the subsequent cleaning of contaminated areas.



### 3. PROJECT EXECUTION

Pre Investigation Spore Trap Air Sample Collection:

1. Pre investigation spore trap air samples will be collected in the general vicinity of designated locations outlined in the "Pipe corrosion Investigation Plan" prepared by GHD dated November 27, 2012. These locations have been identified on floors 5, 10, 17, 21, and 22 on the plans attached.
  - a. GHD will collect mold spore air samples utilizing Zefon spore trap cassettes at 15 liters per minute for 5 minutes each to collect 75 liters per sample. The collected spore trap air samples will be submitted to an AIHA accredited laboratory, EMLab P&K of Sacramento, California. Each set of samples will be accompanied by a chain of custody record.

To properly complete this work, the following actions are required:

1. Work is to be completed by a qualified contractor experienced with mold remediation procedures and requirements as well as general construction, repair, and restoration.
2. The remediation approach, procedures, materials, and equipment shall be consistent with the EPA guidelines "Mold Remediation in Schools and Commercial Buildings" (EPA 4002-K-01-001 March 2001), the New York City Department of Health "Guidelines on Assessment and Remediation of Fungi in Indoor Environments", January 2002, and the "DRAFT Operations and Maintenance Plan for 450 N Street, Sacramento" dated 11 March 2011, prepared by: LaCroix Davis LLC.
3. All work shall be completed after regular business hours, when the identified locations are unoccupied. Critical barriers will be installed and the work area will be sealed off if the area of work will involve mold remediation.

Containment:

1. Allied Environmental will construct a mini-containment, approximately eight square feet to allow access to above ceiling pipe for investigation procedures to be conducted in each investigation location, as directed by the State's Representative. The mini-containment will consist of 6 mil plastic to the perimeter wall and floors with at minimum two chambered unit (a work room and a decontamination area) secured with the use of tape and zippers. Workers will decontaminate and remove personal protective equipment (PPE) using HEPA vacuum and hand washing procedures prior to egress. All equipment and waste containers shall be HEPA vacuumed and wet-wiped prior to removal from the containment work area. The area outside the mini-containment will be demarcated with signage.
2. Install clean HEPA filtered negative pressure unit to maintain a negative pressure of at least -0.02 inches of column water, indicated with use of a manometer, in the designated work area. Exhaust air is to be ducted away from public entry points. For this investigation project the



exhaust air will be ducted into the nearest restroom exhaust units. Any equipment used for this purpose must be clean, decontaminated and free of other hazardous contaminants. All HEPA filtered negative pressure units and HEPA filtered vacuum equipment shall be DOP tested onsite prior to start of work. For the purpose of this project extra negative pressure units will be onsite and ready for use in-case of equipment failure or emergency situation where additional units are needed.

3. Glove bag assembly will be on-site and available for use in areas where investigation work requires pipe removal and possible pipe breakage may occur. This procedure is to help mitigate potential water leaks during pipe removal work.

#### Personal Protective Equipment:

1. NIOSH approved half face respirators (at minimum), gloves, and eye protection during clean-up activities. Disposable coveralls to prevent contamination of personal clothing are required. *Note: No personal protective equipment or disposable clothing is to be worn outside the secure work area to prevent unnecessary alarm or concern of contamination outside the isolated work area. PPE will need to be removed in the decontamination chamber of the containment prior to egress.*

#### Investigation Procedures & Cleanup Methods:

1. Acoustical ceiling panels:
  - a. Approximately two, 2' x 4', acoustical ceiling tiles will be removed to conduct all pipe investigation work; if needed, a mini-containment enclosure will be in place per the containment requirements listed above.
    - i. Any acoustical ceiling panels removed for above ceiling pipe access with visual evidence of mold growth or damage shall be removed, bagged, disposed of and replaced with a new acoustical ceiling panel. GHD will visually inspect the area visually clear of contamination and/or debris prior to containment disassembly.
    - ii. Any acoustical ceiling panel removed for above ceiling pipe access with no evidence of mold growth or damage shall be replaced following pipe investigation work. GHD will visually inspect the area is clear of debris prior to completion.
2. Sheetrock/wallboard systems:
  - a. During pipe investigation work a mini-containment enclosure will be constructed, as directed by the State's Representative, in accordance with containment requirements listed above.
    - i. Any visible mold growth observed on sheetrock/wallboard systems that will not be disturbed during the investigation work shall be isolated and covered with poly and sealed with tape to prevent contamination and further potential of exposure during pipe investigation procedures. Tape lift samples as well as direct moisture test readings, as described below, of accessible staining will be collected of any



visible mold growth or suspect liquid stained areas for direct microscopic analysis to assess accurate moisture levels. These areas along with sample results will be documented and included in a brief close-out letter summary for future mitigation. GHD will visually inspect the area to be dry and visually clear of contamination and/or debris prior to disassembling the containment.

1. Tape Lift Sampling:

Any accessible sheetrock/wallboard system with suspect liquid stains or visible mold growth will be sampled using Bio-Tape™ or a similar method to be analyzed by direct microscopic examination. All samples will be sent to an AIHA accredited laboratory with a chain of custody record.

- ii. Any visible mold growth observed on sheetrock/wallboard systems on the surface to be impacted by pipe investigation work (within the mini-containment foot print) shall be remediated prior to penetrating any additional layers of wallboard. Subsequent layers of wallboard shall be cut, remediated, and repaired in accordance with the State Fire Marshall's specifications for repair of fire wall systems.
- iii. If no visible evidence of mold growth the pipe investigation work will be followed by a final visual inspection. GHD will visually inspect the area to be dry and visually clear of contamination and/or debris prior completion.

3. Major wall penetration:

- a. During the pipe investigation work it is not anticipated to penetrate walls, however if wall penetration is required work will be rescheduled to begin on a Friday after hours in the event the major wall penetration of the suspect core wall planned for investigation work is opened and visible mold growth is encountered. A mini-containment enclosure will be in place per the containment requirements listed above.
  - i. Work starting on a Friday after hours will allow time to complete mitigation, air clearance, surface repair and containment disassembly prior to normal business hours. GHD will collect tape lift samples for direct microscopic analysis, the area will be cleaned and treated with a colored sealant/encapsulant prior to pipe investigation work. A product, such as Foster® Full Defense™ 40-25 or approved alternate, may be used as recommended in the *Draft O&M Plan for 450 N Street, Sacramento, Appendix C*. Following pipe investigation procedures and patching of the wall, the containment will remain in place with negative air machines allowing the air to "scrub" for approximately 12 hours. Spore Trap Air samples will be collected after 'scrubbing of the air' and containment will be disassembled once clearance criteria is met (all air samples will be collected in accordance with the *Draft O&M Plan for 450 N Street, Sacramento, Appendix C*) and reconstruction work is completed.



- ii. If the area has no visible mold growth however it is apparent the area was previously treated for mold, documentation of conditions will be provided and included in a brief close-out letter summary. The pipe investigation work to be conducted will be performed, followed by patching of the wall. GHD will visually inspect the area to be dry and visually clear of contamination and/or debris prior to disassembling the containment. *Note: not all colored paint which may be observed in work areas above the ceilings means there was mold present in the past. Colored paint may have been used for other purposes in the past. At the time of above ceiling inspections in the work areas it will be confirmed with on-site personnel whether a previous mold related issue occurred in the past on such colored painted surfaces.*

#### Visual Inspections:

1. Pre-start visual inspections will be conducted in each work area prior to pipe investigation work to determine if pipe investigation work will involve areas with visible mold present. If visible mold is present in the work area, work will need to be completed according to the appropriate procedures listed above and in accordance with applicable EPA guidelines “Mold Remediation in Schools and Commercial Buildings” (EPA 4002-K-01-001 March 2001), the New York City Department of Health “Guidelines on Assessment and Remediation of Fungi in Indoor Environments”, January 2002, and/or the “DRAFT Operations and Maintenance Plan for 450 N Street, Sacramento” dated 11 March 2011, prepared by: LaCroix Davis LLC.
2. Post-investigation visual inspections will be conducted in each work area following all pipe investigation work completion. If mold mitigation occurred, spore trap air samples will be collected and clearance criteria will be accomplished prior to disassembling the containment. If no visible mold growth was encountered during our investigation work the containment will be disassembled following an acceptable post-investigation visual inspection.

#### Spore Trap Sampling:

1. Acceptable sample results are spore trap results are below on a gross count basis and statistically similar to exterior air samples for mold spore type representation and levels. A statistical program such as MoldSCORE provided by an AIHA accredited laboratory shall be used to evaluate the comparison data and verify that the resulting data is consistent with the visual observations of the adequacy of clean-up.

#### Unforeseen Possible Events and Procedures

1. In the event an active leak or wet building materials are found:
  - a. Any active leak encountered shall be promptly reported to state representative.
  - b. Any visible mold growth observed in an area where an active leak or wet building materials are found that will not be disturbed during the investigation work shall be isolated and covered with poly and sealed with tape to prevent contamination and further



potential of exposure during pipe investigation procedures. Tape lift samples, as described above, will be collected of visible mold growth or suspect liquid stained areas, if accessible. Tape lift samples will be analyzed by direct microscopic analysis by an accredited laboratory. GHD will also collect direct moisture test readings, in accessible areas, to assess moisture levels. These areas along with sample results will be documented and included in a brief close-out letter summary for future mitigation. A containment will be constructed in accordance with criteria listed above to allow pipe investigation work. At completion of pipe investigation work GHD will visually inspect the work area to be dry and visually clear of contamination and/or debris. GHD will collect spore trap samples, in accordance with EPA guidelines and BOE O&M Protocols and Procedures. Once satisfactory results are report from the laboratory the containment will be disassembled.

- c. Any visible mold growth observed in an area where an active leak or wet building materials are found on a surface to be impacted by pipe investigation work (within the mini-containment foot print) shall be reported to the State's Representative prior to penetrating or disturbing the area. All procedures shall be in accordance with EPA guidelines, BOE O&M Protocols and Procedures, and Investigation Procedures & Cleanup Methods (which are listed above). Following any remediation work, GHD will visually inspect the work area to be dry and visually clear of contamination and/or debris. Following the pipe investigation work, GHD will collect spore trap samples, in accordance with EPA guidelines and BOE O&M Protocols and Procedures. Once satisfactory results are report from the laboratory the containment will be disassembled.
- d. If no visible evidence of an active leak or wet building materials the pipe investigation work will be followed by a final visual inspection. GHD will visually inspect the area to be dry and visually clear of contamination and/or debris prior completion.
- e. If a repair is required at the time of discovery the area will be cleaned and remediated prior to repair work. All repair work shall be directed by the State.

Although unlikely and not expected, if any building materials should become wet in the work areas during the pipe investigation work Allied Environmental will be prepared with additional negative air machines for expansion of containment, if required, as well as all dehumidifiers, equipment, materials, and personnel. Wet building materials should be dried, replaced and/or cleaned and encapsulated as deemed feasible upon consultation with the State Fire Marshall and consistent with established protocols. Any openings shall be resealed upon completion of work followed by an appropriate response action upon consultation with all participants.

These recommended remediation procedures, implemented, shall prevent exposure to workers by using proper work practice, containment controls, and proper isolation methods. The procedure includes a means of easily visually verifying areas have been undisturbed and left in its original condition.

A brief close-out letter summarizing events in each work area, including laboratory data will be produced at the end of the project and will be distributed.



If you should have any questions or concerns regarding this work plan, please do not hesitate to contact us at (916) 372-6606.



## 4. DEFINITIONS

1. Competent Person – An onsite supervisor who has been formally trained in abatement and who is capable of identifying hazards, substandard and improper hazard controls, procedures, practices, and conditions and who has sufficient experience and authority to take prompt corrective measures to eliminate them.
2. Containment – Protective physical barriers and associated means and methods used to contain airborne contaminant dust within the Work Area and prevent contamination of surfaces and grounds below and adjacent to areas where a hazardous material is being disturbed.
3. Contractor – The company, or individual, that enters into a contract with the Department of General Services to perform the pipe investigation work as described by this work plan.
4. HEPA Filter – A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of particles greater than 0.3 microns in diameter.
5. HEPA Vacuum Equipment – High efficiency particulate air (absolute) filtered vacuuming equipment with a filter system capable of collecting and retaining dust. Filters shall be certified to be of 99.97% efficiency for retaining particles of 0.3 microns diameter or larger.
6. Mini-containment or Mini-enclosure – A small temporary enclosure constructed of impervious material (such as plastic sheeting). The entire Work Area is contained or enclosed by this system to prevent the escape of contamination outside the Work Area. Except when used on man lifts, mini-containments are typically required to have an air lock at the point of entry/egress.
7. Owner – State of California or State.
8. Owner's Representative – Representative(s) Owner (State) has assigned to manage, oversee, and inspect this project. This may include an architectural and/or construction management consultant hired by Owner to oversee the project and/or the assigned Construction Inspector. Also known as State's Representative.
9. Personal Protective Equipment (PPE) – Coveralls, respirators, gloves, eye and hearing protection, hardhats and/or other personal equipment worn by individuals for the purpose of shielding from exposure to potentially hazardous materials or site conditions.
10. Qualified Person – The specially trained individual to be responsible for conducting air sampling, calibration of air sampling pumps, evaluating sampling results, and conducting respirator fit tests. This role is often assigned to the Competent Person.
11. State's Representative – Environmental Consultant hired to conduct compliance observation and air monitoring services on behalf of the Owner. Also known as the Owner's Observation Service or State's Observation Service.



12. Visually Clean – Free of visible dust, dirt, debris, or films removable by vacuuming or wet cleaning methods specified.
13. Work Area – A designated and controlled area in which hazardous materials-impacted work activities are undertaken or which may become contaminated as a result of such actions. A Work Area, also known as a Regulated Area, is a controlled area delineated by barrier tape (or similar means) at minimum and signage to restrict access to Authorized Personnel. In some instances, a higher degree of physical isolation and control may be required and specified.



Attachment A

## Pipe Investigation Plans

Proposed Investigation Areas with Approximate Containment Locations



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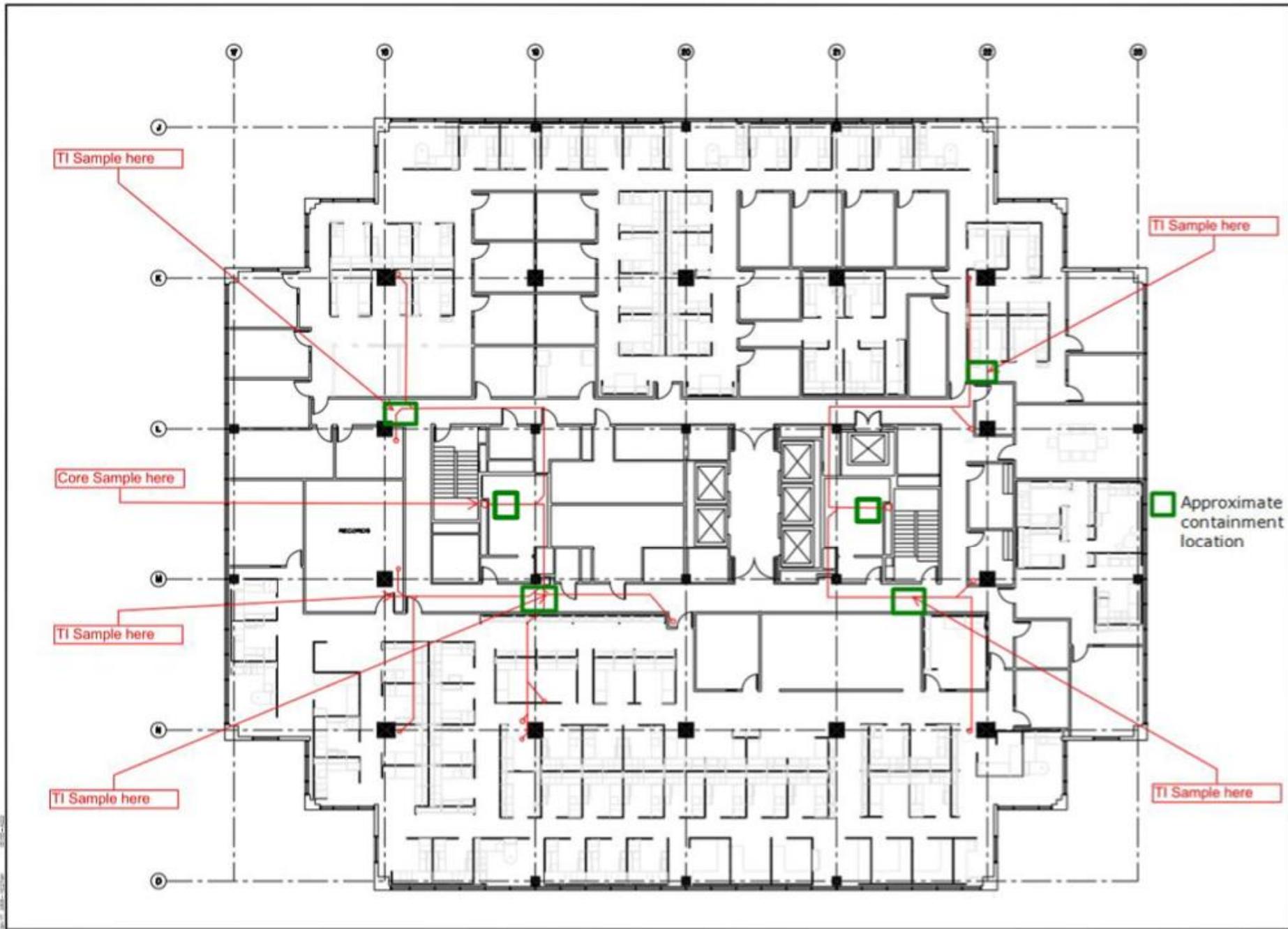












450 N STREET

BOARD OF EDUCATION  
SACRAMENTO, CA

CLIENT:

State of California  
Department of General Services  
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REGISTRATION INFORMATION  
Professional Engineer  
No. 10000000000000000000  
Exp. 12/31/2025  
No. 10000000000000000000  
Exp. 12/31/2025

TI Sample here

TI Sample here

Approximate  
containment  
location

Core Sample here

TI Sample here

TI Sample here

TI Sample here

Project No:  
**TWENTY SECOND  
FLOOR PLAN**

**Pipe Investigation  
Plan**

Scale: 1/8" = 1'-0"  
Project # 22-00120  
Date: 07/23/2022  
Drawn: BJC  
Checked: BJC

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Sheet Title or Name of Job