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SPECIFICATIONS

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SECTION 01715 - EXISTING CONDITIONS - HAZARDOUS MATERIALS SURVEY

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

As specified in SECTION 01001 - GENERAL REQUIREMENTS.

1.02 SUMMARY

A. This Section includes the Kauai Veterans Memorial Hospital's Hazardous Materials Survey for this project, which is provided for the Contractor's information.

B. Related Sections include the following:

1. SECTION 13281 – REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS for requirements of all work which disturbs ACBM. Also, refer to the drawings.

2. SECTION 13288 – TESTING AND AIR MONITORING for requirements of air monitoring during all work which disturbs asbestos containing materials (ACM).

1.03 ASBESTOS

A. The structure or structures to be renovated or modified under this contract were surveyed for the presence of asbestos containing building materials (ACBM). A copy of the initial survey report, as well as any subsequent supplemental survey report(s) if performed, is included in this Section.

1. Review the attached report(s) for the basis on which the ACBM finding was made. The Contractor may perform further surveys at its own expense, if ACBM not shown in the report(s) is suspected in the areas of the building(s) in which work will be performed. If ACBM is found, notify G70 immediately. G70 will reimburse the Contractor for reasonable costs for the testing if additional ACBM is found.

2. If there is ACBM outside of the areas in which work will be performed, this ACBM shall not be disturbed in any way.

B. If applicable, notify employees, subcontractors, and all other persons engaged on the project of the presence of asbestos in the existing buildings in accordance with the requirements of Chapter 110, Article 12-110-2 (f) (1) (B) of the Occupational Safety and Health Standards, State of Hawaii and 29 CFR 1926.1101.

C. In the event that work is required in any building or buildings on the site other than the one(s) designated within this project scope, request copies of the asbestos survey report(s) for such building(s) from G70. Based on the

information contained in the additional survey(s), notify affected personnel.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 SURVEY (attached)

Limited Asbestos and Lead-Based Paint Sampling and Analysis, 2107-00256-HAZ KVMH, Kauai Veterans Memorial Hospital, Radiology Suite, 4643 Waimea Canyon Drive, Waimea, Hawaii, 64 pages, dated August 11, 2021, prepared by ENPRO Environmental.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02070 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Work Includes:

1. Demolition and removal of designated partitions, doors, flooring, ceilings, soffits, mechanical, plumbing and electrical fixtures, finishes and components as indicated on the Drawings
2. Demolition of portions of concrete slabs.
3. Demolition of portions of concrete slabs for removal of designated utilities.
4. Identifying, disconnecting, capping or sealing, and removing utilities.
5. Salvage designated items.

B. Related Work Described Elsewhere

1. Section 01010 – SUMMARY OF WORK
2. Section 01310 – PROJECT MANAGEMENT AND COORDINATION
3. Section 01500 – TEMPORARY FACILITIES AND CONTROLS
4. Section 01595 – PROJECT CLEANING
5. Section 01770 –CLOSEOUT PROCEDURES

C. The extent of selective demolition work is indicated on the demolition plan and other drawings.

D. It shall be the responsibility of the Contractor to examine the project site and determine the existing conditions for themselves.

E. Selective demolition work includes but is not limited to removal and subsequent disposal of all non-hazardous materials indicated or required to be removed.

F. Execute all work in an orderly and careful manner with due consideration for all items or work to remain.

G. Clearly obvious conditions requiring selective demolition, which exist at the site, shall be accepted as part of the work, even though they may not be clearly indicated on the Drawings and/or described herein, or may vary therefrom.

H. All debris of any kind accumulated from the work of this Section shall be disposed of off the site, unless noted otherwise.

I. Permits, Notice, Etc.:

1. The Contractor shall procure and pay for all necessary permits or certificates the may be required in connection of this work.

2. The Contractor shall serve proper notice and consult with Project Manager regarding any temporary barricades that are required, or for disconnections of electrical or other utility lines in the area which may interfere with the removal work. All such lines, where necessary, shall be properly disconnected or relocated prior to commencing with demolition work.

1.02 SUBMITTALS

A. Meet requirements of Section 01330 – SUBMITTAL PROCEDURES

B. Proposed Protection Measures: Submit informational report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Portions of Building: Portions of the site, including structures, adjacent to the areas to be demolished are to be kept intact. The demolition to take place in these areas is to be performed with the utmost care to avoid damage to the adjacent structures. Submit detailed special measures proposed to protect adjacent structures to remain.

C. Schedule of Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.

2. Temporary interruption of utility services.

3. Shutoff of utility services.

D. Demolition Plans: Drawings indicating the following:

1. General site, building(s) and other features to be removed and disposed of.

2. Locations of temporary protection and means of egress for adjacent occupied areas of the building.

E. Pre-demolition Photographs: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations. Submit before the Work begins.

1.03 QUALITY ASSURANCE

A. Use adequate numbers of skilled mechanics who are thoroughly trained and experienced in the necessary crafts.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in Section 01310 – PROJECT MANAGEMENT AND

COORDINATION. Review methods and procedures related to building demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be demolished.
2. Review and finalize demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review and finalize protection requirements.
4. Review procedures for noise control, and dust control.
5. Review items to be salvaged and returned to the owner.
6. Review procedures for protection of adjacent, occupied structures or buildings.
7. Review schedule of work hours and facility rules.

1.04 PROJECT CONDITIONS

A. Existing conditions: The owner assumes no responsibility for actual condition of items to be demolished.

B. Conditions existing at time of commencement of contract will be maintained by the owner insofar as practical.

C. Occupancy: Building areas subject to demolition will be vacated and discontinued in use by the owner prior to start of work.

D. Do not interfere with use of adjacent building areas. Maintain free and safe passage to and from occupied spaces.

E. Provide accessibility around temporary structures conforming to ADAAG Section 4.1.1(4).

F. Prevent movement or settlement of structures. Provide and place bracing or shoring and be responsible for safety and support of adjacent structures. Assume liability for such movement, settlement, damage, or injury. Cease operations and notify the Project Manager immediately, if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.

G. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from the Project Manager. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations, as directed by the Project Manager.

H. Comply with Section 01500 – TEMPORARY FACILITIES AND CONTROLS for environmental controls including dust and noise control.

I. Fire Safety: Fire safety during demolition shall comply with Section 16 of the 2012 NFPA 1 - Fire Code, as amended and NFPA 241.

1.05 EXISTING UTILITY SERVICES

A. Do not abandon or otherwise alter utility services or drainage lines which would impair service to existing building areas.

B. Maintain utilities in service, protect, and reconstruct if damaged, all in-service utility pipes or conduits, except services to the structures to be dismantled. Reconstruct in-service utility pipes or conduits if damaged at no additional cost to the owner.

C. If service must be interrupted, observe requirements of Section 01500 – TEMPORARY FACILITIES AND CONTROLS.

D. Report damage, however slight, immediately. Do not repair or reconstruct any utility pipe, conduit or installation without authorization; however, except perform emergency repairs immediately.

1.06 HAZARDOUS MATERIALS

A. Hazardous Materials: It has been determined that some hazardous materials exist based on the Hazardous Materials Survey performed on structure or structures to be renovated or modified under this contract. The survey is found in Section 01715 - EXISTING CONDITIONS - HAZARDOUS MATERIALS SURVEY.

B. Abatement, Disposal of hazardous materials and Testing and Air Monitoring shall be performed in strict accordance with the following specification sections:
1. Section 13280 – TESTING AND AIR MONITORING.
2. Section 13282 – REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS for all work which disturbs asbestos.

1.07 COORDINATION

A. Arrange demolition schedule so as not to interfere with the owner's on-site operations and operations of adjacent occupied buildings and areas.

1. At the end of each work period areas are required to be cleaned and readied for occupants. The condition of the areas shall be such that there is no interference with the typical work activities perform by the occupants and that the occupant's safety is not compromised

PART 2 - PRODUCTS

2.01 SALVAGE MATERIALS

A. Salvaged materials not indicated for reuse or salvage for the owner shall become Contractor's property. Remove from site and dispose of at Contractor's option.

1. Items to be salvaged for Owner not indicated in the Contract Documents will be identified at the Pre-Construction meeting walk-through.

B. Items of salvageable value not indicated for reuse may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed. Storage or sale of removed items on site will not be permitted.

C. Historic items, antiques, and similar objects including, but not limited to, commemorative plaques and tablets, and other items of interest or value to the owner that may be uncovered during demolition remain the property of the owner.

1. Carefully salvage in a manner to prevent damage and promptly return to the Owner.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the conditions under which work of this section will be performed. Do not proceed until unsatisfactory conditions detrimental to timely and proper completion of the work have been corrected.

B. Verify that utilities have been disconnected and capped before starting demolition operations.

C. Inventory and record the condition of items to be removed and salvaged. Photograph existing conditions of structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work. File with Project Manager prior to starting work.

D. Engage a professional engineer currently licensed in the owner to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

E. If hazardous materials were found to exist, verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

A. Maintain exit requirements throughout construction period.

B. Erect and maintain temporary barricades complying with the requirements of Section 01500 – CONSTRUCTION FACILITIES. On completion, remove barricades and repair damaged surfaces to match adjacent surfaces.

C. Existing Utilities: Locate, identify, disconnect, and remove indicated utilities serving portions of the building to be demolished.

1. If removal, relocation, or abandonment of utility services will affect adjacent occupied areas and buildings, then provide temporary utilities that bypass the portions of the building to be demolished and that maintain continuity of service to other buildings and adjacent areas.

2. Cut off pipe or conduit and cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

3.03 DEMOLITION

A. Demolition Work: Conform to owner of Hawaii, Occupational Safety and Health Standards; Subtitle 8, Division of Occupational Safety and Health; Part 3, Construction Standards; Chapter 131.1, Demolition.

B. Pollution controls: Provide temporary enclosures and use suitable methods to limit dust and dirt to the lowest practical level. Comply with governing regulations pertaining to environmental protection. Observe dust control measures of Section 01567 – POLLUTION CONTROL.

C. Explosives: Use of explosives will not be permitted.

D. Selective Demolition

1. Extent of demolition and removal as shown are minimum requirements. Contractor shall be responsible for the extent of work required to properly accommodate the methods of construction required for the new work. Additional work required to accommodate construction shall be considered incidental to the new work and shall be done at no additional cost to the owner. Contractor and its demolition subcontractor, as part of the bid proposal to review the demolition scope along with the new work and conduct site visit(s) to understand the extent of the scope and provide as part of its bid proposal, to include all work to accomplish the final work.

2. Conduct demolition of designated items and components as indicated on the Drawings and site investigation(s) in an orderly and careful manner as required to accommodate new work, including that required for connection to the existing building. Protect existing supporting structural members.

3. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for

sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

4. Use the utmost care to avoid damage to the items being removed and designated for reuse including but not limited to:

5. Disconnect, remove, cap and seal designated utilities as indicated on the Drawings.

6. Use methods required to complete the Work within limitations of governing regulations.

7. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

8. Cease operations and notify Architect and Project Manager immediately if safety of adjacent structure appears to be endangered. Do not resume operations until safety is restored.

9. Remove contaminated, vermin infested, or dangerous materials encountered and dispose of by safe means.

10. Do not demolish, chip or penetrate any portion of existing structural members not designated for such without the expressed approval of the Architect and Engineer.

11. Repair excess demolition to match adjacent surfaces.

E. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove debris, rubbish, and other materials resulting from demolition operations from the site. Transport materials removed from demolished structures and legally dispose of off site.

B. Do not allow demolished materials to accumulate on-site.

C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

D. Burning of removed materials from demolished structures will not be permitted on site.

3.05 CLEANUP AND REPAIR

A. Repair damage to adjacent structure and improvements resulting from this work at no cost to the owner.

B. Clean adjacent areas, structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by Project Manager or governing authorities. Return adjacent areas to condition existing prior to start of work.

END OF SECTION

SECTION 08710 - FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes:

1. Hardware for interior doors, other than hardware specified in specific door Sections.
2. Furnish and deliver to the building site, all finishing hardware required for all doors, etc., complete as indicated on Drawings and as specified.
3. It is the intent of this Specification to cover in general the class and character of all finish hardware required.
4. The hardware list specified has been made for the convenience of the Contractor and covers in general the necessary hardware for doors, casework, etc., but all other doors, etc., shown on the Drawings and not covered by the general characterization shall be fitted with appropriate hardware of the same standards as the hardware described throughout these specifications. Contractor shall furnish hardware schedule as specified.
5. Suppliers proposing substitutes of equivalent products of other than the manufacturers named shall submit schedules listing the product and manufacturer specified and the product and manufacturer of proposed substitute.

B. Related Work described elsewhere:

1. Section 06412 - ARCHITECTURAL CASEWORK

1.02 REFERENCES: The publications listed below form a part of this Specification to the extent referenced. These publications are referred to in the text by the basic designation only.

A. ADA – Department of Justice 2010 ADA Standards for Accessible Design

B. BHMA – Builders Hardware Manufacturers Association

C. NFPA 80 - Fire Doors and Windows.

D. NFPA 252 - Fire Tests of Door Assemblies.

E. SDI – Steel Door Institute

F. UL 10B - Fire Tests of Door Assemblies.

G. UL 305 - Panic Hardware.

H. NFPA 101 - Life Safety Code.

I. IBC – 2006 International Building Code

1.03 SUBMITTALS

A. Schedule: Furnish eight (8) copies of the schedule of hardware in compliance with specifications and Drawings. Schedule format shall be vertical type as listed in DHI document "Sequence and Format for the Hardware Schedule". List each opening and hardware to be applied. State materials finish, and manufacturer's number for each item. Required types are listed.

B. Manufacturer's Data: Submit manufacturer's descriptive literature along with schedule for information only.

C. Certified Test Reports: Indicate that each item listed under Hardware Items meets the standard listed for that item. A copy of the listing of proposed hardware items in the current applicable BHMA directories of certified products may be submitted in lieu of test reports.

D. Project Reference Samples: Upon delivery of finish hardware to the site, select and tag one item of each different type. Identify each item by reference publication type or number and manufacturer’s catalog number. Items shall remain on file until similar items have been installed, at which time items on file shall be installed in predetermined locations.

E. Templates: Furnish hardware templates of each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check Shop Drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

F. Tools and Maintenance Instructions: Furnish a complete set of special wrenches, tools, maintenance instructions applicable to each different or special hardware component.

G. Certification: After completion and inspection by hardware supplier of all construction work, certify on an approved form, that all items of finish hardware have been adjusted and are working properly and that all hardware on fire rated (labeled) closures conforms to requirements of ULI.

H. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.

1.04 PROJECT RECORD DOCUMENTS

A. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.05 OPERATION AND MAINTENANCE DATA

A. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

B. The manufacturer's representative shall instruct the user's staff on the hardware's maintenance procedures (type of lubricant needed and frequency of maintenance).

1.06 QUALITY ASSURANCE

A. Perform work in accordance with Americans with Disabilities Act Accessibility Guidelines ADAAG Section 404.1, NFPA 80, "Fire Doors and Fire Windows", NFPA

101, "Life Safety Code", UL10C, "Fire Tests of Door Assemblies", NFPA 252, "Fire Tests of Door Assemblies", and ICC IBC as applicable. Each door that is an element of an accessible route shall comply with ADAAG Section 404.1 and shall be mounted no higher than 48-inches above finish floor.

B. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience. Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

C. Hardware Supplier: Company specializing in architectural finish hardware, with a local stock warehouse, who has furnished hardware in Hawaii for a period of not less than three years.

D. Hardware Supplier Personnel: Employ an experienced Architectural Hardware Consultant (AHC), or architects approved equal, who is available at reasonable times during the course of the Work, to the Engineer and Contractor for consultation about Project's hardware requirements, to verify specified hardware with door function and hardware finishes, and to establish keying system.

E. Hardware Installer: Company specializing in the installation of architectural hardware and approved by the architect and architectural hardware consultant (AHC), or architects approved equal.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for accessibility and requirements applicable to fire rated doors and frames.

B. Products Requiring Electrical Connection: Listed and classified by Underwriter's Laboratories, Inc., as suitable for the purpose specified and indicated.

C. Definition: “Door Hardware" includes items known commercially as finish hardware which are required for swing and sliding doors, except special types of unique and non-matching hardware specified in same section as door and door frame.

1.08 DELIVERY, STORAGE AND HANDLING

A. Delivery, store, protect and handle products to prevent damage of any kind and to maintain security to site.

B. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at proper times to proper locations (shop or project site) for installation.

D. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

E. Deliver keys to Engineer by security shipment direct from hardware supplier.

F. Provide secure lock-up for hardware delivered to project but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.

1.09 COORDINATION

A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware, and door machining for all hardware items.

1.10 WARRANTY

A. Provide one year warranty. Ten (10) years on Door Closers, with two (2) years on Electrical Components. Where longer warrant is standard with the manufacturer, furnish the longer warranty.

B. The Surety shall not be liable beyond 2 years of the Project Acceptance date.

1.11 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Asbestos Prohibition: No asbestos containing material materials shall be used under this section. The Contractor shall insure that all material incorporated in the project are asbestos-free.

2.02 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware is indicated in HARDWARE GROUPS at end of this section. Products are identified by using proprietary catalog numbers, and are used to establish quality and function of products desired.

B. Product numbers indicated in the HARDWARE GROUPS are those of the manufacturers listed and are used to establish the quality of products intended.

2.03 MATERIALS AND FABRICATION

A. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of indicated door.

B. Base Metals: Produce hardware units of basic metal and forming method specified, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item

and with ANSI A156.18 for finish designations indicated. Do not furnish optional materials or forming methods for those indicated, except as otherwise specified.

C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

D. Furnish screws for installation, with each hardware item. Provide Phillips flat head screws except as otherwise indicated. Finish exposed screws to matches hardware finish. If exposed in surfaces of other work, to match finish of such other work as closely as possible, including prepared-for-paint finish in surfaces to receive painted finish.

E. Expansion shields in concrete or masonry shall fill the depth and diameter of drilled holes.

F. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the Work. In such cases, provide sleeves for each through bolt or use sex screws fasteners.

G. Bring to the attention of the University any discrepancy between the Hardware Groups and door schedule prior to ordering.

2.04 HINGES, BUTTS AND PIVOTS

A. General: Hinges shall conform to ANSI/BHMA A156.1, pivots shall conform to ANSI/BHMA A156.4, and the requirements of this specification.

B. Templates: Except for hinges to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Screws: Furnish Phillips flat head or machine screws for installation of units, except furnish Phillips flat head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

D. Hinges Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Nonferrous Hinges: Stainless steel pins.
2. Interior Doors: Nonrising pins.
3. Tips: Flat button and matching plug, finished to match leaves.

E. Number of Hinges: Provide number of hinges in accordance with BHMA A 156.1 but not less than 3 hinges for door leaf for doors 90 inches or less in height and one additional hinge for each 30 inches of additional height.

F. Size of hinges shall be as follows:

Door Thickness / Width	Hinge Height	Hinge Width
1-3/4 inch to 36 inches	4-1/2 inch	4 or 4-1/2 inch
1-3/4 inch over 36 inches	5-inch	4-1/2 Extra Heavy Ball Bearing

1-3/4 inch over 48 inches	5-inch	4-1/2 Extra Heavy Ball Bearing

2.05 LOCK CYLINDERS AND KEYING

A. Lock cylinders shall be ASSA high security key system, 6 pin tumblers to match University of Hawaii Manoa ASSA system. The lock cylinders shall be master-keyed to the University ASSA high security key system as directed by the University.

B. Provide no more than ten (10) keys per lockset; exact quantity to be determined during keying schedule. Stamp all keys “University of Hawaii do not duplicate.”

C. Upon acceptance of the project, the contractor shall arrange for temporary keys from HHSC if further access is required.

2.06 LOCKS, LATCHES AND BOLTS

A. General: Mortise locks and latches shall conform to ANSI/BHMA A156.13, Grade 1, bored locks and latches shall conform to ANSIIBHMA A 156.2, bolts shall conform to ANSI/BHMA A156.16, ADAAG Section 404.2.7, and the requirements of this specification

B. Mortise Locksets shall be manufactured in a single sized case formed from 12 gauge minimum steel. The case shall be closed on all sides and back. The lockset shall have a field-adjustable, beveled armored front, with a 0.125-inch minimum thickness.

C. Mortise locksets shall have freewheeling outside levers on all exterior doors. The freewheeling lever design shall allow the lever to swing freely up to 70 degrees, when the door is locked.

D. Strikes: Provide manufacturer's standard wrought box strike for each latch of lock bolt, with curved lip extended to protect frame, finish to match hardware set. Provide dustproof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolts.

E. Lock Throw:

1. Provide 3/4-inch minimum throw of latch, and 1-inch minimum Deadbolt.

F. Flush Bolt Heads: Minimum of 1/2-inch diameter rods of brass, bronze or stainless steel, with minimum 12-inch long rod for doors up to 7 feet in height; minimum 42-inches long rod for doors up to 9'-6" in height.

G. Provide locksets, latches, and cylinders equal in all respects to those specified in the Hardware Groups. All thumb turns shall conform to ADAAG Section 404.2.7.

2.07 CLOSERS AND DOOR CONTROL DEVICES

A. Standards: Comply with BHMA A 156.4 for closers, BHMA A 156. 15 for closer holder release devices and ADAAG Section 404.2.8.1 and Section 404.2.9 and the requirements of this specification.

B. Grade: BHMA Grade1 for all closers.

C. Size of Units: Comply with manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather, and anticipated frequency of use. Where parallel arm closers are installed, provide closer unit one size larger than recommended for use with standard arms.

D. Maximum effort to operate doors shall not exceed 8.5 pounds for exterior doors and 5 pounds for interior doors, such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the door may be increased not to exceed 15 pounds.

E. Surface Closers:

1. Provide parallel arm or regular arm closer as required to mount closer on door face least exposed to public traffic.
2. Closers shall have brass adjustment operating valves for closing speed, latching speed and backcheck control as a standard feature.
3. Closers shall have one piece high performance aluminum alloy body.
4. Closer covers shall be high impact non corrosive, flame retardant.
5. Closer shall not require removal for adjustments to be made.

F. Following door closers will be considered equal subject to Project conditions:

1. LCN - 4041 Series.
2. Corbin Russwin - DC6000 Series.
3. Norton - 7500 Series.
4. Sargent - 351 Series.

2.08 DOOR SEALS

A. Standard: Comply with BHMA A156.22.

B. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702

C. Provide noncorrosive fasteners as recommended by manufacturer for application indicated.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

E. Smoke Seals: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784

1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors. Provide continuous seals at each edge of door leaf.

F. Thresholds: Provide all thresholds as indicated on the door schedule conforming to ANSI/BHMA A156.21 and ADAAG Section 404.2.5.

2.09 FINISHES

A. Standard: Comply with BHMA A156.18.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Designations used are those listed in ANSI/BHMA A156.18 -American National Standards for Materials and Finishes, including coordination with traditional U.S. finishes shown by certain manufacturers for their products.

1. If no BHMA finish is established, match specified product.

D. Provide matching finishes for hardware units at each door or opening to greatest extent possible, except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where base metal or metal forming process is different for individual units of hardware exposed at same door or opening.

E. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for applicable units of hardware by referenced standards.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Pre-Installation Meeting: Before start of work under this contract, the Contractor, hardware installer, hardware manufacturer's representative or supplier and the University shall meet to review the hardware installation instructions and installation conditions.

B. Verify that doors and frames are ready to receive Work and dimensions are as indicated. Hardware installer must notify the architect of any conflicts prior to installing hardware.

3.02 INSTALLATION

A. Install each hardware item in compliance with manufacturer's instructions and recommendations.

B. Mount hardware units at height indicated in ANSI/SDI A250.8, "Recommended Specification for Standard Steel Doors and Frames", except:

1. As otherwise indicated or as required to comply with governing regulations or ADAAG Section 404.2.7.

2. Mount deadbolt (if any)) centerline to conform with ADAAG Section 404.2.7 above latchset handle centerline.

C. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work. Do not install surface mounted items until finishes have been completed on the substrate.

D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set metal thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant as specified in Section 07920 – SEALANTS.

G. Fit face of all mortise parts snug and flush.

H. Operating parts shall move freely and smoothly without binding, sticking or excessive clearance.

I. Protect hardware from damage or marring of finish during construction. Use strippable coatings, removable tapes or other approved means.

J. Ensure that hardware displays no evidence of finish paint after building cleanup with exception of prime coated hardware installed for finish painting. The Contractor may achieve this by sequencing installation, removing after fittings and reinstalling after painting is completed, providing protection, cleaning original hardware finish, or other approved means.

K. Latch and bolt: Install latch and bolt to automatically engage in keeper, whether activated by closer or manual push. In no case shall additional manual pressure be required to engage latch or bolt in keeper.

L. Closers:

1. Do not mount closers on corridor side of door except at exterior doors.

2. Carefully adjust closers to be operated noiselessly and evenly and to conform to ADAAG Section 404.2.8 and Section 404.2.9.

3. Have manufacturer's representative regulate closers prior to University's acceptance of building.

3.03 FIELD QUALITY CONTROL

A. Required certified Architectural Hardware Consultant or architects approved equal from door hardware supplier to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUST AND CLEAN

A. Hardware installer shall adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace items which cannot be adjusted to operate freely and smoothly as intended for application made.

B. Hardware installer shall clean adjacent surface soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, hardware installer shall return to the Work during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area:

1. Clean operating items as necessary to restore proper function and finish of hardware and doors.
2. Adjust door control devices to compensate for final operation of ventilating equipment.
3. Lubricate bearings surface of moving parts and adjust latching and holding devices for proper function.
4. Test keys for proper conformance with keying system.

3.05 HARDWARE GROUPS

MANUFACTURER LIST

CATEGORY	VENDOR NAME	MFG
ADA CLASSROOM SET	BY ACCURATE LOCK & HARDWARE CO.	ACU
ADA ENTRY SET	BY ACCURATE LOCK & HARDWARE CO.	ACU
ADA PULLS	BY ACCURATE LOCK & HARDWARE CO.	ACU
AUTO OPERATOR	BY BESAM ENTRANCE SOLUTIONS	BSM
ELECTRIC STRIKE	BY HANCHETT ENTRY SYSTEMS, INC.	HAN
ELECTRICAL HINGE	BY McKINNEY PRODUCTS COMPANY	MCK
HINGE	BY McKINNEY PRODUCTS COMPANY	MCK
AUTO. DOOR BOTTOM	BY PEMKO MANUFACTURING CO.	PEM
DOOR SEAL	BY PEMKO MANUFACTURING CO.	PEM
SMOKE SEAL	**BY PEMKO MANUFACTURING CO.**	**PEM**
SPLIT ASTRAGAL	BY PEMKO MANUFACTURING CO.	PEM
INTERMEDIATE PIVOT	BY RIXSON DOOR CONTROLS	RIX
PIVOT SET	BY RIXSON DOOR CONTROLS	RIX
AUTOMATIC FLUSH BOLT	BY ROCKWOOD MANUFACTURING CO.	ROC
COORDINATOR	BY ROCKWOOD MANUFACTURING CO.	ROC
DUST PROOF STRIKE	BY ROCKWOOD MANUFACTURING CO.	ROC
FLOOR STOP	BY ROCKWOOD MANUFACTURING CO.	ROC
FLUSH BOLT	BY ROCKWOOD MANUFACTURING CO.	ROC
WALL OR FLOOR STOP	BY ROCKWOOD MANUFACTURING CO.	ROC
WALL STOP (CONVEX)	BY ROCKWOOD MANUFACTURING CO.	ROC
CLASSROOM LOCK	BY SARGENT MANUFACTURING COMPANY	SAR
CONCEALED O.H.STOP	BY SARGENT MANUFACTURING COMPANY	SAR
DOOR CLOSER	BY SARGENT MANUFACTURING COMPANY	SAR
ELEC RIM EXIT DEVICE	BY SARGENT MANUFACTURING COMPANY	SAR
ENTRY LOCK	BY SARGENT MANUFACTURING COMPANY	SAR
MORTISE CYLINDER	BY SARGENT MANUFACTURING COMPANY	SAR
PASSAGE SET	BY SARGENT MANUFACTURING COMPANY	SAR
PRIVACY SET	BY SARGENT MANUFACTURING COMPANY	SAR
RIM EXIT DEVICE	BY SARGENT MANUFACTURING COMPANY	SAR
HANGER	BY DORMAKABA USA, INC.	STA
POCKET DOOR SET	BY DORMAKABA USA, INC.	STA
ADA WALL SWITCH	BY WIKK INDUSTRIES, INC.	WIK
KEY SWITCH	BY WIKK INDUSTRIES, INC.	WIK
HALF SADDLE THRES	BY ZERO INTERNATIONAL	ZER
PERIMETER SEAL @HEAD	BY ZERO INTERNATIONAL	ZER
SLIDING AUTO DR BOT	BY ZERO INTERNATIONAL	ZER

HW GROUP - 001

3.0 EA	HINGE	T4A3386 5 X 4.5 US26D	MCK
1.0 EA	RIM EXIT DEVICE	8813 ETL US32D	SAR
		KEY AS DIRECTED.	
1.0 EA	ELECTRIC STRIKE	9600 12/24VDC 630	HAN
1.0 EA	AUTO OPERATOR	SW200i - SGL	BSM
1.0 EA	WALL STOP (CONVEX)	406 630	ROC
2.0 EA	ADA WALL SWITCH	S-4X4-3-US32D	WIK
1.0 EA	KEY SWITCH	S-SG-KEY1MAIN-US32D	WIK

HW GROUP - 002

5.0 EA	HINGE	T4A3386 5 X 4.5 US26D	MCK
1.0 EA	ELECTRICAL HINGE	QC8-T4A3386 5 X 4.5 US26D	MCK
2.0 EA	FLUSH BOLT	555 626	ROC
1.0 EA	DUST PROOF STRIKE	570 626	ROC
1.0 EA	ELEC RIM EXIT DEVICE	55-56-8813 ETL US32D X 644 STRIKE	SAR
		KEY AS DIRECTED.	
1.0 EA	AUTO OPERATOR	SW200i - SGL ACTIVE DOOR	BSM
2.0 EA	WALL STOP (CONVEX)	406 630	ROC
1.0 EA	**SMOKE SEAL**	**S773D LENGTH AS REQUIRED**	**PEM**
2.0 EA	SPLIT ASTRAGAL	29310 CS LENGTH AS REQUIRED	PEM
2.0 EA	ADA WALL SWITCH	S-4X4-3-US32D	WIK
1.0 EA	KEY SWITCH	S-SG-KEY1MAIN-US32D	WIK

HW GROUP - 003

1.0 EA	PIVOT SET	L147 US26D 3/4"	RIX
1.0 EA	INTERMEDIATE PIVOT	ML19 US26D	RIX
1.0 EA	PASSAGE SET	28-74-10U15 LL US26D WBX	SAR
1.0 EA	DOOR CLOSER	74-351 O EN LEAD LINED COVER	SAR
1.0 EA	WALL STOP (CONVEX)	406 630	ROC
1.0 EA	DOOR SEAL	S773D LENGTH AS REQUIRED	PEM
1.0 EA	AUTO. DOOR BOTTOM	411ARL LENGTH AS REQUIRED	PEM

HW GROUP - 004

3.0 EA	HINGE	TA2314 4.5 X 4.5 US26D	MCK
1.0 EA	CLASSROOM LOCK	28-10G37 LL US26D WBX	SAR
		KEY AS DIRECTED.	
1.0 EA	WALL STOP (CONVEX)	406 630	ROC

HW GROUP - 005

3.0 EA	HINGE	TA2314 4.5 X 4.5 US26D	MCK

1.0 EA	ENTRY LOCK	28-10G24 LL US26D WBX KEY AS DIRECTED.	SAR
1.0 EA	WALL STOP (CONVEX)	406 630	ROC
1.0 EA	DOOR SEAL	S773D LENGTH AS REQUIRED	PEM
1.0 EA	AUTO. DOOR BOTTOM	411ARL LENGTH AS REQUIRED	PEM

HW GROUP - 006

1.0 EA	POCKET DOOR SET	PDFC150N-00-70	STA
1.0 PR	HANGER	BP250N-41 (1PR)	STA
1.0 PR	ADA PULLS	7200P US26D BTB	ACU
1.0 EA	FLOOR STOP	441H 626 TO KEEP DOOR 4" OUT OF POCKET	ROC

HW GROUP - 007

1.0 EA	PIVOT SET	L147 US26D 3/4"	RIX
1.0 EA	INTERMEDIATE PIVOT	ML19 US26D	RIX
1.0 EA	PASSAGE SET	28-74-10U15 LL US26D WBX	SAR
1.0 EA	DOOR CLOSER	74-351 O EN LEAD LINED COVER	SAR
1.0 EA	WALL OR FLOOR STOP	406 630 / 441H 626 AS REQUIRED	ROC

HW GROUP - 008

6.0 EA	HINGE	TA2314 3.5 X 3.5 US26D	MCK
2.0 EA	FLUSH BOLT	555 626	ROC
1.0 EA	DUST PROOF STRIKE	570 626	ROC
1.0 EA	CLASSROOM LOCK	1-28-10G37 LL US26D WBX KEY AS DIRECTED.	SAR
2.0 EA	CONCEALED O.H.STOP	1537 S US26D (25-1/8" - 32-1/2")	SAR

HW GROUP - 009

2.0 EA	PIVOT SET	L147 US26D 3/4"	RIX
2.0 EA	INTERMEDIATE PIVOT	ML19 US26D	RIX
1.0 EA	AUTOMATIC FLUSH BOLT	2840 626 (TOP ONLY)	ROC
1.0 EA	PASSAGE SET	28-74-10U15 LL US26D WBX	SAR
1.0 EA	COORDINATOR	1700 628	ROC
2.0 EA	DOOR CLOSER	74-351 O EN LEAD LINED COVER	SAR
2.0 EA	WALL OR FLOOR STOP	406 630 / 441H 626 AS REQUIRED	ROC
1.0 EA	DOOR SEAL	S773D LENGTH AS REQUIRED	PEM
2.0 EA	AUTO. DOOR BOTTOM	411ARL LENGTH AS REQUIRED ASTRAGAL BY DOOR MANUFACTURER.	PEM

HW GROUP - 010

3.0 EA	HINGE	TA2314 4.5 X 4.5 US26D	MCK
1.0 EA	PRIVACY SET	V54-8265 LNL US26D WBX	SAR
1.0 EA	DOOR CLOSER	1431 UO EN	SAR

1.0 EA	WALL STOP (CONVEX)	406 630	ROC

HW GROUP - 011

1.0 EA	PIVOT SET	L147 US26D 3/4"	RIX
1.0 EA	INTERMEDIATE PIVOT	ML19 US26D	RIX
1.0 EA	PRIVACY SET	V54-74-8265 LNL US26D WBX	SAR
1.0 EA	DOOR CLOSER	74-351 O EN LEAD LINED COVER	SAR
1.0 EA	WALL OR FLOOR STOP	406 630 / 441H 626 AS REQUIRED	ROC

HW GROUP - 012

1.0 EA	POCKET DOOR SET	PDFC150N-00-70	STA
1.0 PR	HANGER	BP250N-41 (1PR)	STA
1.0 EA	ADA CLASSROOM SET	9100ADAL-3ST US26D	ACU
1.0 EA	MORTISE CYLINDER	41 US32D KEY AS DIRECTED.	SAR
1.0 EA	FLOOR STOP	441H 626 TO KEEP DOOR 4" OUT OF POCKET	ROC

HW GROUP - 013

1.0 EA	POCKET DOOR SET	PDFC150N-00-70	STA
1.0 PR	HANGER	BP250N-41 (1PR)	STA
1.0 EA	ADA ENTRY SET	9100ADAL-3 US26D	ACU
1.0 EA	MORTISE CYLINDER	41 US32D KEY AS DIRECTED.	SAR
1.0 EA	FLOOR STOP	441H 626 TO KEEP DOOR 4" OUT OF POCKET	ROC
2.0 EA	PERIMETER SEAL @HEAD	381A LENGTH AS REQUIRED	ZER
1.0 EA	SLIDING AUTO DR BOT	7350AA LENGTH AS REQUIRED	ZER
2.0 EA	HALF SADDLE THRES	627A LENGTH AS REQUIRED	ZER

HW GROUP - 014

3.0 EA	HINGE	TA2314 4.5 X 4.5 US26D	MCK
1.0 EA	PASSAGE SET	28-10U15 LL US26D WBX	SAR
1.0 EA	DOOR CLOSER	1431 O EN	SAR
1.0 EA	WALL OR FLOOR STOP	406 630 / 441H 626 AS REQUIRED	ROC
1.0 EA	DOOR SEAL	S773D LENGTH AS REQUIRED	PEM
1.0 EA	AUTO. DOOR BOTTOM	411ARL LENGTH AS REQUIRED	PEM

HW GROUP - 015

2.0 EA	**PIVOT SET**	**L147 US26D 3/4"**	**RIX**
2.0 EA	**INTERMEDIATE PIVOT**	**ML19 US26D**	**RIX**
1.0 EA	**FLUSH BOLT**	**555 626 (TOP ONLY)**	**ROC**
1.0 EA	**PASSAGE SET**	**28-74-10U15 LL US26D WBX**	**SAR**
1.0 EA	**DOOR CLOSER**	**74-351 O EN LEAD LINED COVER**	**SAR**
2.0 EA	**WALL OR FLOOR STOP**	**406 630 / 441H 626 AS REQUIRED**	**ROC**
1.0 EA	**DOOR SEAL**	**S773D LENGTH AS REQUIRED**	**PEM**

2.0 EA	**AUTO. DOOR BOTTOM ASTRAGAL**	**411ARL**	**LENGTH AS REQUIRED BY DOOR MANUFACTURER.**	**PEM**

END OF SCHEDULE

END OF SECTION

DIVISION 13 – SPECIAL CONSTRUCTION

SECTION 13280 – TESTING AND AIR MONITORING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

The General Instructions to Bidders, the General Conditions of Construction Contracts, and Special Provisions, and Section 01001 – GENERAL REQUIREMENTS preceding these specifications shall govern this section of work.

1.02 PRELIMINARY

In performing this project, all possible safeguards, precautions and protective measures should be utilized to prevent exposure of any individual to hazardous materials.

1.03 REQUIREMENTS

A. Basis for specifications: These specifications are based upon procedures and standards derived from U.S. regulatory agencies (EPA, OSHA, NIOSH) and the Hawaii State Division of Occupational Safety and Health as well as from industry and sound industrial hygiene practices. They must be followed to ensure that no measurable amount of asbestos fibers are released to the uncontrolled work and public areas.

Testing and visual inspections shall be conducted by the Architect's Project Monitor (Testing and Air Monitoring Consultant), for the purpose of:

1. Verifying compliance with the specifications and the applicable regulations listed in Section 13281;

2. Ensuring that the documentation required by these specifications and by law is collected and reported to G70;

3. Enforcing and initiating engineering controls during the project;

4. Ensuring that the general public and other workers not directly involved in the abatement and/or remediation project are not harmed.

B. The Architect shall hire and pay an independent firm that has the personnel with the qualifications and expertise to conduct work outlined herein as a the Project Monitor.

C. Procure legally required reports for air monitoring as part of the contract. All air monitoring reports shall include all field data, laboratory reports, test results, pump calibration, on-off times, calibration device used, description of the type of pumps used, location of sampling and other pertinent information about the daily work activities.

D. Air monitoring and testing conducted by the Project Monitor in order to follow up on work by the Contractor due to non-conformance with the requirements shall be the responsibility of the Contractor. The full cost of such additional monitoring shall be borne by the Contractor.

E. Personal air monitoring on Contractor's personnel that is part of the Contractor's prerogative shall be accommodated by the Project Monitor.

F. Any testing above and beyond what is specified and initiated by the Contactor shall be paid for by the Contractor at no additional cost to G70.

G. Analytical Method;

1. Asbestos: Use the most current version of the NIOSH 7400 Method (PCM) or approved substitute per OSHA revisions for Personal Monitoring and Excursion Limit sampling. The Architect's Project Monitor shall use NIOSH 7400 method (PCM) to determine asbestos-in air for Air Clearances.

H. Air monitoring and testing will be conducted according to the method prescribed by OSHA 29 CFR 1926.1101 (f) (for asbestos); HIOSH 12-145.1 (for asbestos); NIOSH 7400 method or approved substitute per OSHA revisions 15 August 1994 (for asbestos); the Asbestos Hazard Emergency Act (AHERA) 40 CFR Part 763, and Asbestos Containing Materials in Schools.

I. Applicable Standards and Guidelines:

1. All work under this contract, and any other trade work conducted with the project, shall be done in strict accordance with all applicable federal, state and local regulations, standards and codes governing the disturbance of asbestos-containing material; demolition, handling, transportation and disposal of asbestos materials. Where conflict or any inconsistency among requirements of this specification exists, the more stringent requirements shall apply. Contractor shall pay for all fines where violations of regulations result in fines, damages to property or injury to workers and the general public.

2. The most recent edition of any relevant regulation, standard, document or code shall be in effect.

J. Specific Statutory and Regulatory Requirement

1. Department of Health: State of Hawaii; Title 11, Chapter 501, Hawaii Administrative Rules, entitled "Asbestos Requirements".

1.04 COORDINATION WITH OTHER SECTION

See SECTION 13281 – REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIAL

1.05 ABBREVIATIONS

A. CFR: Code of Federal Regulations

B. EPA: U.S. Environmental Protection Agency

C. HIOSH: Division of Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii

D. HUD: Housing and Urban Development

E. NESHAP: National Emission Standards for Hazardous Air Pollutants

F. NIOSH: National Institute for Occupational Safety and Health

G. OSHA: Occupational Safety and Health Administration

H. PEL: Permissible Exposure Limit

1.06 DEFINITIONS

A. Abatement: Procedure to control fiber release from asbestos-containing building materials.

B. Air Clearance: Air monitoring inside the containment after passing visual clearance to determine if the containment area is safe for occupancy without the aid of respiratory equipment.

C. Air Monitoring: The process of measuring the concentration of a specific contaminant in the air by sampling a known volume of air in a stated period of time.

D. Ambient Air Monitoring: The process of measuring the concentration of a specific contaminant in the air by sampling a known volume of air in a stated period of time in one location. Standard practice is to use tripod stands that will hold the sampling device in a 45-degree downward direction between 5 to 6 feet in height and clear from any obstructions.

E. Excursion Limit: Personal monitoring for asbestos work representing a 30-minute exposure. The 30-minute exposure period must not exceed 1.0 fibers per cubic centimeter of air.

F. Personal Monitoring: An air monitoring procedure where the air-sampling cassette is placed in the breathing zone of the work being monitored. An eight-hour time weighted average is then calculated to compare with OSHA/HIOSH PELs.

G. Project Monitor: A person who shall perform, certify and document ambient air conditions during the work, visual clearances, air clearances, post remediation verification, and clean up and removal of all asbestos-

containing material and associated waste from the project site. The Architect's Project Monitor shall be currently certified by the State of Hawaii's Department of Health as an Asbestos Project Monitor.

H. Visual Clearance: The process by which the Architect's Project Monitor ensures by a visual inspection that the materials scheduled to be removed have been completely removed including debris and dust on the inside and debris on the outside of the regulated work area.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 ASBESTOS TESTING

A. The Architect's Project Monitor shall conduct ambient air monitoring daily during the work. Collect air samples in and around the outside perimeter of the work area in locations that may provide avenues of fiber release such as but not limited to entrances and exits to the work area and exhaust fan outlets. Collect at least three samples throughout the day in various locations. Ensure that the air samples are representative of the entire work period.

B. Airborne asbestos levels in areas adjacent to the work area or in any part of the work site impacted by the asbestos removal, surface preparation and demolition activities shall not exceed 0.01 fibers per cubic centimeter of air.

C. The Abatement Contractor shall collect personal air monitoring. Personal air monitoring results shall not exceed 0.1 fibers per cubic centimeter of air per eight-hour time-weighted-average.

D. The Abatement Contractor shall conduct Excursion Limit personal sampling to identify short term, high exposure levels at least one time or more throughout the day.

E. If Ambient Air Monitoring results exceed applicable regulatory levels, the Architect's Project Monitor shall stop all work immediately in the work area causing or contributing to such a condition. Ensure that remedial action is taken immediately (i.e. increase misting, utilize less dust creating methods of demolition, etc.) to reduce concentrations to acceptable levels before starting work.

F. If Personal Monitoring or Excursion Limit results exceed applicable regulatory levels, the Abatement Contractor shall stop all work immediately in the work area causing or contributing to such a condition. Ensure that remedial action is taken immediately (i.e. increase misting, utilize less dust creating methods of demolition, etc.) to reduce concentrations to acceptable levels before starting work.

G. Visual Clearances: A Visual Clearance shall be conducted by the Architect's Project Monitor after the abatement work has been completed.

H. The Architect's Project Monitor shall submit a letter within 1 work day to the Architect certifying that the area had passed Visual Clearance. Letter shall be signed by the Architect's Project Monitor.

END OF SECTION

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13281 - REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

As specified in SECTION 01001 - GENERAL REQUIREMENTS.

1.02 SUMMARY

A. This project entails activities that are expected to disturb asbestos containing materials (ACM). Activities that will disturb asbestos for this project are defined as Category 1, non-friable abatement. Asbestos containing vinyl floor tile assemblies and covebases with associated mastics require removal as part of this project.

The Abatement Contractor is to furnish all labor, materials, and equipment necessary to safely carry out this work in compliance with these specifications and EPA, OSHA, State of Hawaii, and any other applicable regulations. Whenever there is a conflict or overlap of the above references, the most stringent shall apply. In performing asbestos removal activities, all possible safeguards, precautions, and protective measures should be utilized to prevent exposure of any individual to asbestos fibers.

All work under this section is to be coordinated with the General Contractor and the Qualified Consultant. The Abatement Contractor shall verify the existing locations, conditions, layers, and thicknesses of all materials prior to commencing work that may disturb ACM. All asbestos-containing material (ACM) as identified in Section 01715 – EXISTING CONDITIONS – HAZARDOUS MATERIAL SURVEY, and/or any asbestos survey report included as part of the contract documents, and which will be impacted/disturbed by planned renovation activity described in the Contract Documents are included as part of the asbestos related work under this Section even if not identified in this Section.

The Abatement Contractor shall assume all materials within the project area that are similar in appearance to ACM identified in the provided asbestos survey reports are positive for ACM, unless proven otherwise, and is included as work under this Section as required to safely complete this project.

B. The asbestos work for this project shall generally include:

Class I Asbestos Abatement: Removal of asbestos containing vinyl floor tile assemblies and covebases with associated mastics.

C. In general, the principal items of the asbestos-related work shall be as follows:

1. Worker protection.

2. Negative air containment.

3. Preparation of the work area.

4. Management and disposal of dislodged asbestos containing materials.

5. Installation and removal of protective sheeting.

6. Final cleanup of work area.

D. Cleaning shall include removal of all asbestos-containing materials within the work area and any related dust or debris.

E. Cleanup shall include removal of all asbestos-containing materials within the work area and any related dust or debris.

1.03 COORDINATION WITH OTHER SECTIONS

A. The Contractor shall coordinate all asbestos disturbance work with G70, the General Contractor and the Qualified Consultant.

B. SECTION 13288 - TESTING AND AIR MONITORING

1.04 SUBMITTALS

A. General: Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Final payment will not be made until copies of all submittals have been furnished to and accepted by G70. Submit 6 copies of the submittal package to include the items listed below.

C. Notices: As early as possible, but prior to commencement of work, send courtesy 10-day notice of the scheduled asbestos removal work to:

State of Hawaii, Department of Health,""Notification of Demolition and Renovation" form. Send to: Indoor and Radiological Health Branch, State Department of Health, Asbestos Program, 99-945 Halawa Valley Street, Aiea, Hawaii 96701.

D. Insurance: Proof of insurance for Workman's Compensation and General Liability which covers asbestos and pollution.

E. Manufacturer's Data: Submit 6 copies of manufacturer's specifications, safety data sheets (SDS), installation instructions and field test procedures for each material, and all equipment related to asbestos handling and disturbance, including other data as may be required to show compliance with these specifications and proposed uses. Indicate the application rate for encapsulant as specified herein. Indicate by transmittal form that a copy of each installation instruction has been distributed to the installer.

F. Samples: Submit samples of the following items for approval prior to ordering materials:

1. Asbestos Encapsulant(s): 6 copies of manufacturer's literature including all laboratory data, MSDS, and application instructions.

2. Plastic Sheeting: Six, 8.5 by 11-inch pieces of each thickness and type of plastic sheeting with labels indicating actual mil thickness.

3. Surfactant: 6 copies of manufacturer's literature including all laboratory data, SDS, mixing and application instructions.

4. Tapes and Adhesives: 6 copies of manufacturer's literature including all laboratory data.

5. Warning Labels and Signs: 6 copies of examples of all required signage.

6. Protective Clothing: 6 copies of manufacturer's literature on all protective clothing and one sample of each item (which will be returned to the Contractor).

7. Respirator Equipment: 6 copies of manufacturer's literature on all respirator equipment and one sample of each item which will be returned to the Contractor.

G. Work Plan: Submit six copies of an asbestos abatement Work Plan, signed by a State of Hawaii Department of Health Certified Asbestos Project Designer. The Work Plan shall provide detailed information concerning:

1. Location of regulated (control) work area boundaries.

2. Location and construction of containment area.

3. Location and construction of decontamination area(s).

4. Preparation of work area.

5. Personal protective equipment including respiratory protection and protective clothing.

6. Decontamination procedures for the personnel who may be exposed to asbestos.

7. Handling and disposal methods and procedures to be used.

8. Required air monitoring procedures and sampling protocols.

9. Procedures for final cleanup.

10. A sequence of work and performance schedule in coordination with other trades.

11. Emergency procedures.

12. Descriptions of any equipment to be employed not discussed.

13. Security provisions in and around the project area.

14. Outline of work procedures to be employed.

15. Location of the waste dumpster.

16. Staging (sequence) of work.

17. Locations of entrances and exits.

18. Description of all disposal methods, including asbestos debris, plastic sheeting, PPE, decontamination fluids, HEPA filters, etc.

19. Name and resume of the Asbestos Abatement Contractor's onsite Competent Person (Job Foreman) responsible for compliance with all Federal, State and Local regulations and plans and specifications. No work shall be performed unless the designated Competent Person is onsite.

H. Documentation for Instruction (Training): Furnish certification that each and every individual, including foremen, supervisors, workers, employees, other company personnel or agents, and any other individual who may be exposed to airborne asbestos fibers, who may be responsible for any aspects of Asbestos Abatement activities, or who is allowed or permitted to enter areas where such exposure may occur, has had instructions on the dangers of asbestos exposure, on respirator use, and decontamination, from an EPA approved training facility, as required. Training shall be consistent with EPA requirements for training as set forth in 40 CFR 763.92(a)(2). Contractor shall be responsible for keeping the documentation up to date and subsequent submittals before any additional employee or individual, not originally listed in the Work Plan, is allowed within the Work Area. Also submit documentation that personnel stated above have had instructions on the nature of the Asbestos Abatement activities and operations that may create a risk of asbestos exposure and the necessary protective steps, on use and fitting of respirators (in accordance with OSHA's Respiratory Protection Standard, 29 CFR 1910.134).

Provide documentation of training relative to procedures for protective dress, on use of showers (if necessary), on entry and exit from the work areas under normal and emergency conditions, on all aspects of work procedures and protective measures, and on all provisions of 29 CFR 1926.1101, and

confirmation that each and every employee understands these instructions. This documentation shall be an outlined format of the instruction and shall be signed by all employees to be engaged on this project, and by all individuals before being allowed within the project site and must include an acknowledgment and an assumption of the potential risk of exposure by that individual and a release of liability for any such exposure. The Asbestos Abatement Contractor shall be responsible for keeping the documentation up to date and providing subsequent submittals before any additional employee or individual, not currently on this list, is allowed within the project site

Submit completed and signed "Employee Acknowledgement of Instruction and Release" forms. A sample "Employee Acknowledgement of Instruction and Release" form is provided at the end of this section.

I. Medical Surveillance Program: Submit 6 copies of the Asbestos Abatement Contractor's medical surveillance program prepared in accordance with all applicable laws, and all medical examination documentation for all employees to be used on this project.

J. Respiratory Protection Program: Submit 6 copies of the Asbestos Abatement Contractor's respiratory protection program prepared in accordance with all applicable laws. The Contractor shall also submit fit test data on all employees to be used on this project.

K. Hazard Communication Program: Submit 6 copies of the Asbestos Abatement Contractor's hazard communication program prepared in accordance with all applicable laws.

L. Site Emergency Action Plan: Submit 6 copies of the Asbestos Abatement Contractor's site emergency action plan prepared in accordance with all applicable laws.

M. Documentation from Physician: Submit documentation from a physician that all employees or agents who may be exposed to airborne asbestos have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, documentation that all individuals permitted within the project site have received medical monitoring or had such monitoring made available to them as required in OSHA 29 CFR 1926.1101, and 29 CFR 1910.134. The Asbestos Abatement Contractor must be aware of and provide information to the examining physician about unusual conditions in the work place environment (e.g. high temperatures, humidity, chemical contaminants) that may impact on the employee's ability to perform work activities. The Asbestos Abatement Contractor shall keep and make available to all affected individuals a record and the results of such examinations.

N. HEPA Vacuums: Submit manufacturer's certification that vacuums conform to ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems as applicable to this project.

O. Respirators: Submit notarized certifications that respirators meet all requirements of NIOSH and EPA. Document NIOSH approval of all respiratory protective devices utilized on site. Include manufacturer's certification of HEPA filtration capabilities for all cartridges and filters.

P. Rental Equipment: When rental equipment is to be used in abatement areas or to transport asbestos-contaminated waste, a written notification concerning intended use of the rental equipment must be provided to the rental agency and a copy of this notification is to be included as a project submittal.

Q. Entry Log: The Asbestos Abatement Contractor shall maintain a log of all personnel other than the Contractor's employees and agents who enter the work area while asbestos abatement operations are in progress until after final clearance is received. The log shall contain the following information as a minimum and certified copies shall be submitted weekly:

1. Date of visit.
2. Visitor's name, employer, business address, and telephone number.
3. Time of entry and exit from work area.
4. Purpose of visit.
5. Type of protective clothing and respirator worn.
6. Certificate of release signed and filed with the contractor.

R. Daily Log: The Asbestos Abatement Contractor shall maintain a daily log documenting the dates and times of, but not limited to, the following items:

1. Meetings; purpose, attendees, brief discussion.
2. Visitations; authorized and unauthorized at the job site.
3. Special or unusual events, i.e., equipment failures, accidents.

1.05 SUBMITTAL AFTER WORK IS COMPLETED

A. General: Submit in accordance with SECTION 01300 – SUBMITTALS.

B. After the completion of the Asbestos Abatement work, a final report shall be prepared by the Asbestos Abatement Contractor for acceptance by G70. Six copies of the report shall be submitted and shall include the items listed below.

1. The project name, Asbestos Abatement Contractor, Asbestos Abatement Contractor license number, notification form to DOH, work duration, material removed or disturbed, respiratory protection employed, employee exposure air sample results, and results of the most current PAT round for the laboratory conducting all air samples.

2. Certification of the Asbestos Abatement Contractor and Competent Person.
3. Visitor/Worker Entry Log (as described in Section 1.04).
4. Clearance certifications received from the Qualified Consultant.
5. Duration of the work.
6. Daily certification by the Asbestos Abatement Contractor's onsite Competent Person that all work has been performed in accordance with all applicable laws, specifications and approved work plan.
7. Waste Disposal Manifest Forms (if needed): Submit copies of all transport manifests, trip tickets and disposal receipts for all asbestos-containing and asbestos-contaminated waste materials removed from the work area during the abatement process in accordance with State and Federal requirements.
8. Air monitoring tests and test results from Qualified Consultant.
9. Documentation of Asbestos Abatement Contractor's completion of the following:
    a. Inspection of work area preparation prior to start of Asbestos Abatement Work and daily thereafter.
    b. Progress of the work.
    c. The Competent Person's inspections prior to encapsulation of the area from which asbestos containing materials were removed.
    d. Removal of waste materials from work area.
    e. Decontamination of equipment (list items).
    f. Daily certification by the Asbestos Abatement Contractor's onsite Competent Person that all work has been performed in accordance with all applicable laws, specifications and approved work plan.
10. Waste Disposal Manifest Forms: Submit copies of all transport manifests, trip tickets and disposal receipts for all asbestos-containing waste materials removed from the work area during the abatement process in accordance with State and Federal requirements.
11. Qualified Consultant Daily Air Monitoring, Testing Laboratory and Project Monitor: The Qualified Consultant shall submit name, address and telephone number of air monitoring testing laboratory selected for sample analysis and reporting of airborne fiber concentrations along with evidence that the Qualified Consultant's Project Monitor is a State of Hawaii certified Asbestos Project Monitor.

1.06 PRODUCT HANDLING

Delivery and Storage of Materials: Deliver materials to the site in original packages, containers or bags fully identified with manufacturer's name, brand

and lot number. Store materials in a dry well-ventilated space, under cover, off the ground and away from surfaces subject to dampness or condensation as approved by the Qualified Consultant. Material that becomes contaminated with asbestos shall be disposed of in accordance with applicable regulations. Replacement materials shall be stored outside the contaminated work area until abatement is completed.

1.07 PROTECTION

A. Site Security: The work area is to be restricted only to authorized, trained, and protected personnel during the project. These may include the Asbestos Abatement Contractor's employees, employees of Subcontractors, the Qualified Consultant and his representatives, local regulatory inspectors, responding emergency personnel, and any other designated individuals. A list of authorized personnel shall be established prior to job start.

1. Entry to the work area by unauthorized individuals shall not be permitted without the express approval of G70 and any such entry shall be reported immediately to G70 by the Asbestos Abatement Contractor.

2. A Visitor/Worker Entry Log shall be maintained by the Asbestos Abatement Contractor.

3. The Asbestos Abatement Contractor shall have control, subject to approval of G70, of security in the work area and in proximity of Asbestos Abatement Contractor's equipment and materials.

B. Site Protection and Safety: As a minimum, follow the requirements of EPA, HIOSH (State of Hawaii), OSHA and NIOSH. Take all necessary precautions to ensure there is no asbestos contamination to those areas not included in the work schedule.

C. Protective Covering: The Asbestos Abatement Contractor shall provide and install protective covering to protect the project site on an "as required" or "upon request" by the Qualified Consultant. Protective covering shall be clear plastic sheets with a minimum thickness of 6-mil.

C. Safeguarding of Property: The Asbestos Abatement Contractor shall take whatever steps necessary to safeguard his work and also the property of G70 and other individuals in the vicinity of his work area during the execution of this Contract. He shall be responsible for and make good on any and all damages by his employees' negligence. Do not load structure with weight that will endanger the structure.

Prior to commencement of work, an annotated description of all existing damaged and missing items shall be submitted to G70. It will be the Asbestos Abatement Contractor’s responsibility to repair and/or replace to G70’s satisfaction all items identified as damaged and/or missing that cannot be proven to have been in this condition prior to the commencement of this project.

D. Completed Work: The Asbestos Abatement Contractor shall provide all

necessary protection for surfaces encapsulated under this section.

1.08 ABBREVIATIONS

A. ANSI: American National Standards Institute, Inc.

B. AHERA: Asbestos Hazard Emergency Response Act.

C. CFR: Code of Federal Regulations.

D. HIOSH: Hawaii Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii.

E. EPA: U.S. Environmental Protection Agency.

F. NESHAPS: National Emission Standards for Hazardous Air Pollutants.

G. MAP: Asbestos Model Accreditation Plan.

H. NIOSH: National Institute for Occupational Safety and Health.

I. OSHA: Occupational Safety and Health Administration.

1.09 GENERAL REQUIREMENTS

A. Furnish required certifications within 10 consecutive calendar days from award, that the Asbestos Abatement Contractor is experienced with the EPA, OSHA and HIOSH regulations related to asbestos, application, removal, disposal, and treatment, and holds a valid C-19 Contractor's license.

B. Furnish certification, within 10 consecutive calendar days from award, that employees have had instructions on the dangers of asbestos exposure, on respirator use and decontamination, from an EPA approved training facility, as described by AHERA Regulation 40 CFR 763, Appendix C to Subpart E, April 30, 1987 and asbestos Model Accreditation Plan (MAP), and Hawaii Administrative Rules, Chapter 11-501 through 11-504.

C. Asbestos Abatement Contractor shall examine and have at all times in his possession at his office (one copy) and in view and readily available at each jobsite (one copy) a current issue of the following publications:

1. Title 29, Code of Federal Regulations, Part 1926.1101 Construction Industry, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

2. State of Hawaii: Occupational Safety and Health Standards, Title12, Subtitle 8, Part 1.

3. Title 29, Code of Federal Regulations, SECTION 1910.134 - General Industry Standard for Respiratory Protection, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

4. Title 29, Code of Federal Regulations, SECTION 1910.2 - Access to Employee Exposure and Medical Records, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

5. Title 29, Code of Federal Regulations, SECTION 1910.1200 - Hazard Communication,, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

6. State of Hawaii: Occupational Safety and Health Standards, Title12, Chapter 203 - Hazard Communication.

7. Guidance for Controlling Asbestos-Containing Materials in Buildings (purple book), U.S. Environmental Protection Agency (EPA).

8. Title 34, Code of Federal Regulations, Part 231, Appendix C, Procedures for Containing and Removing Building Materials Containing Asbestos, U.S. Environmental Protection Agency (EPA).

9. Title 29, Code of Federal Regulations, SECTION 1910.145 - Specifications for Accident Prevention, Signs and Tags, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

10. ANSI Z 288.2 Practice for Respiratory Protection.

11. EPA, Final Response to the Asbestos Hazard Emergency Response Act (AHERA), 40 CFR, Part 763, Subpart E.

12. EPA, Model Accreditation Plan, 40 CFR Part 763 Subpart E. Appendix C.

13. State of Hawaii, Asbestos Requirements, Title 11, Chapter 501 through 504.

14. Project plans and specifications and approved Work Plan.

D. The Asbestos Abatement Contractor shall comply with the above requirements and any applicable State and City and County regulations. Where conflict or any inconsistency exists among requirements, this specification, and approved work plans, the more stringent requirements shall apply. Ignorance of the above requirements and any applicable State and City and County regulations resulting in additional cost to the Asbestos Abatement Contractor or G70 shall be solely the responsibility of the Asbestos Abatement Contractor.

E. All regulations shall govern over these specifications, except that any more stringent specification (including approved work plan) or specification providing greater protection against asbestos exposure, injury, loss or liability shall control to the extent permitted by regulation. Any question regarding conflict or inconsistency between specifications and/or regulations should be directed to G70.

F. Whenever approval of G70 is required prior to proceeding with other work, the following shall be complied with:

1. The Asbestos Abatement Contractor shall allow G70 48 hours from notification to respond to the request for inspection.

2. The Asbestos Abatement Contractor shall designate one person (either a foreman or superintendent) who will be authorized to request inspections. The name of the designated person shall be submitted in writing to G70 prior to commencing with the work. Requests from any other person will not be considered an official request.

3. The designated person, when requesting inspection, shall provide the following information:

   a. Name of caller.

   b. Building and rooms to be inspected.

   c. Work phase of inspection, as specified.

1.10 DEFINITIONS

A. Abatement: Procedure to control fiber release from asbestos containing building materials.

   1. Removal: All herein specified procedures necessary to remove asbestos containing materials from an area and disposal of the material at an approved site in an acceptable manner.

   2. Post-Removal Surface Encapsulation: Procedures necessary to coat surfaces from which asbestos-containing materials have been removed and where designated on the drawings to control any residual fiber release.

B. Air Monitoring: The process of measuring the fiber content of a specific, known volume of air in a period of time. For this project, NIOSH 7400 Method.

C. Amended Water: Water to which a surfactant has been added to reduce water surface tension and thereby provide a more rapid penetration.

D. Asbestos Containing Material: Building material with detectable concentrations of of asbestos including chrysotile, amosite, tremolite, anthophyllite, and/or actinolite.

E. Authorized Visitor: G70, the Qualified Consultant, his representatives, air monitoring personnel, or a representative of any regulatory or other agency having jurisdiction over the project.

F. Encapsulant: A liquid material which can be applied to surfaces from which asbestos-containing material has been removed to control the possible release of residual fibers, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components (penetrating encapsulant). Selected encapsulants shall be compatible with the

existing finishes including wood, metal and/or plastic.

G. Holding Area: A secure area used for the storage of double bagged asbestos-containing material before removal from the project site to an approved disposal site.

H. Fixed Object: A unit of equipment or furniture in the work area which cannot be removed from the work area without dismantling.

I. Friable Asbestos: Asbestos containing material which can be crumbled to dust, when dry, under hand pressure.

J. HEPA Filter: A High Efficiency Particulate Air filter capable of trapping and retaining 99.97 percent of monodispersed particles 0.3 micrometers or greater in diameter.

K. HEPA Vacuum Equipment: Vacuuming equipment that utilizes a High Efficiency Particulate Air (HEPA) filter.

L. Project Monitor: Third-party qualified environmental consultant who is a State of Hawaii certified Asbestos Project Monitor, herein referred to as the Project Monitor.

M. Surfactant: A chemical-wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

N. Qualified Consultant: A third party, independent consultant hired by G70 and not affiliated with the Asbestos Abatement Contractor who will perform air monitoring and inspection during Asbestos Abatement work and shall have the authority to initiate engineering controls. The Qualified Consultant shall be certified as a State of Hawaii Department of Health Project Monitor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic Sheeting: Minimum thickness of 6-mil polyethylene film.

B. Plastic Bags: Minimum thickness 6-mil polyethylene film labeled as specified hereinafter.

C. Tapes: Tape shall be capable of sealing joints of adjacent sheets of polyethylene and for attaching polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including the use of amended water. Silver cloth duct tape, minimum 2 inches wide, and double-faced foam tapes, by Nashua, 3-M. Arno. or pre-approved equal shall be used on polyethylene sheeting, red or NATO orange tape, minimum 2 inches wide for exit arrows.

D. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of

polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

E. Surfactant (Wetting Agent): 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether, or equivalent, and shall be mixed with water to provide a concentration of 1 ounce, or more as needed, of surfactant to 5 gallons of water. (An equivalent surfactant shall be understood to mean material with a surface tension of 29 dynes/em as tested in its properly-mixed concentration, using ASTM Method D 1331-56 (R 1980), "Surface and Interfacial Tension of Solutions of Surface-Active Agents")

F. Asbestos Encapsulant: Encapsulant shall be non-flammable with a Class A fire classification. Encapsulant shall be odorless when dry, and compatible with materials applied by others (separate contract). All references to application at stregths below full strength shall be as approved by the product manufacturer for the intended use.

G. Warning Labels and Signs: As required by OSHA regulation 29CFR 29 CFR 1926.1101. Permanent signage for access panels and areas with encapsulated asbestos-containing materials shall be as specified hereinafter. Signage shall be as approved by G70.

H. Protective Clothing: As specified hereinafter. The Asbestos Abatement Contractor is cautioned that during the summer and fall, there is usually a tremendous shortage of coveralls due to the consumption of these items by mainland contractors for summer abatement projects. The Abatement Contractor shall have all the required sets of coveralls required for this project on island prior to the start of work. There will be no time extension for the unavailability of coveralls or related equipment.

I. Other Materials: Provide all other materials, which may be required to properly prepare and complete this project.

2.02 TOOLS AND EQUIPMENT

A. General: Provide and fabricate suitable tools for the Asbestos Abatement Work.

B. Water Sprayer: Airless or a pressure sprayer for amended water application as applicable.

C. HEPA Vacuum: High Efficiency Particulate Air (HEPA) vacuum.

D. Air Purifying Unit: Air filtration system equipped with HEPA filter.

E. Negative Air Pressure Units: Portable “exhaust units” with air purification equipment in accordance with EPA Document, Guidance for Controlling Asbestos-Containing Materials in Building, (Purple Book), EPA560/5-85-024 of June 1985, Appendix J. Recommended Specifications and Operating Procedures for the Use of Negative Pressure Systems for Asbestos Abatement.

One back-up unit will be on-site during all Asbestos Abatement Work in accordance with HAR 11-501.

F. Paint/Encapsulant Sprayer: Airless type.

G. Other tools and equipment as necessary.

2.03 PERSONNEL PROTECTION REQUIREMENTS

A. The Asbestos Abatement Contractor acknowledges he alone is responsible for instruction and enforcement of personnel protection requirements and that these specifications provide only a minimum acceptable standard.

The Asbestos Abatement Contractor acknowledges that all person(s) within the regulated work area shall not remove respiratory protection. Any person(s) observed removing respiratory protection within the regulated area on more than one occasion will not be permitted to continue any work on the project.

B. Provide workers with personally-issued and marked respiratory equipment approved by NIOSH and accepted by OSHA and HIOSH. All Asbestos Abatement Work shall be performed in air purifying respirators equipped with cartridges approved for asbestos by NIOSH.

C. Loading and Unloading of Double-Bags or Drums at the Project Site and Landfill: Half-face dual-cartridge respirators equipped with cartridges NIOSH approved for asbestos.

D. Other: Should any condition, for any reason, be encountered where the exposure level exceeds the action levels provided by the Qualified Consultant, the Asbestos Abatement Contractor shall stop work and determine the causes of the excessive levels. Should the action level continue to be exceeded, the contractor shall stop work. Work will not be resumed until approval is received from the Qualified Consultant.

E. Beards: Bearded persons will not be permitted in the regulated work area.

F. Provide workers with sufficient sets of disposable protective full-body clothing consisting of material impenetrable by asbestos fibers and of the proper size for each individual to accommodate movement without tearing. Such clothing shall consist of full-body coveralls, footwear, gloves, and headgear. Provide hard hats as required by applicable safety regulations. Disposable clothing shall not be allowed to accumulate and shall be disposed of as asbestos-contaminated waste.

Protective clothing shall be worn by all personnel within the work area from the start of the Asbestos Abatement Work through final encapsulation, until the Asbestos Abatement Contractor has received acceptance of clearance by the Qualified Consultant.

All persons conducting any work within the regulated work area shall remain fully

suited (dressed) with protective clothing at all times. Any persons(s) observed partially suited while conducting work within the regulated area on more than one occasion will be required to be removed from the project.

G. No visitors shall be allowed in work areas, except as authorized by G70 or the Qualified Consultant. Authorized visitors shall be responsible for their own suitable respirators, disposable protective full-body clothing, footwear, gloves and headgear, including hard hat when required and insulated rubber boots or equal.

H. All electrical systems used for Asbestos Abatement Work shall as a minimum be protected with "Ground Fault Circuit Interrupters" selected and installed in strict accordance with the manufacturer's instructions, the National Electric Code and all other pertinent codes. All GFCI inside the regulated work area must be of waterproof type.

I. Additional safety equipment (e.g., hard hats meeting the requirements of ANSI Z89.1-1981, eye protection meeting the requirements of ANSI Z87.1-1979, safety shoes meeting the requirements of ANSI241.1-1967, disposable PVC gloves), as necessary, shall be provided to all workers.

PART 3 - EXECUTION

3.01 WORK PRACTICES AND ENGINEERING CONTROLS

A. Wet methods shall be used.

B. Whenever feasible, local exhaust ventilation shall be used.

C. Containment of work area is required when there is no negative exposure assessment or monitoring results show the PEL has been exceeded.

1. Posting of Caution Signs: Post caution signs in and around the work area to comply with 29 CFR 1926.1101 and all other Federal, State and local requirements. Signs shall be posted at a distance sufficiently far enough away from the work area to permit a person to read the sign and take the necessary protective measures to avoid exposure.

2. Precleaning/Wet-Wiping: Clean the work area first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not use HEPA vacuum equipment on wet surfaces. Pick up all loose debris and any other material that may be considered contaminated with asbestos material.

3. Critical Seals (Barriers): Seal all openings within the contained work area, including but not limited to, roof vents, exhaust hoods, utility plates, and air conditioning equipment intakes/supply vents, with plastic sheeting and tape/adhesive. Plastic sheeting is to remain in place for the duration of the Asbestos Abatement Work or until specified by the Qualified Consultant.

4. Inspect the Building Openings: At the beginning of each work day, the

Asbestos Abatement Contractor shall inspect and ensure that all critical seals are intact and remain closed or sealed.

5. Negative Pressure Containment: For any Asbestos Abatement work conducted within the interior of the building, a negative pressure containment shall be constructed to enclose the work area.

   HEPA Air Filtration: Install a sufficient number of air filtration units to create one full room air exchange every 15 minutes and a negative pressure differential of 0.02 inches of water.

D. Respirators are required for all Asbestos Abatement Work.

E. Temporary Fire Protection:

1. Provide and maintain temporary fire protection equipment during the Asbestos Abatement Work.

2. Equipment shall be of the appropriate type to fight fires associated with the existing building materials and those materials used during the construction operations.

F. Notify the Qualified Consultant and get their approval prior to proceeding with Asbestos Abatement Work as specified herein.

Commencement of work shall not start until:

1. Pre-abatement submissions, notifications, postings and permits have been provided and are satisfactory to the Qualified Consultant.

2. All equipment for Asbestos Abatement Work, clean-up and disposal are on hand.

3. All worker training (and certification) is completed.

4. Asbestos Abatement Contractor receives permission from the Qualified Consultant to commence abatement.

3.02 ASBESTOS FIBER CONCENTRATIONS IN THE WORK AREA

The maximum permissible exposure to airborne concentrations of asbestos fibers within the work area shall be 0.1 fibers per cubic centimeter (f/cc). The maximum permissible exposure to airborne concentrations of asbestos fibers outside the work area shall be 0.01 f/cc or the equivalent of the pre-abatement air sample concentrations. The work shall stop whenever these limits are exceeded and the Asbestos Abatement Contractor shall remedy the condition prior to commencing the work. The expenses resulting from the delays shall be the Asbestos Abatement Contractor's responsibility and shall not be paid by anyone else involved with the project.

3.03 PRIOR TO ASBESTOS ABATEMENT WORK

A. Install critical barriers (seals) at all openings within the work area.

B. Establish regulated area, decontamination areas, and clean areas.

C. Post warning signs.

3.04 PERFORMANCE OF ASBESTOS ABATEMENT WORK

A. The Asbestos Abatement Contractor shall be responsible for any and all damages due to his negligence.

B. Continuously throughout the work shift and at the end of the day the Asbestos Abatement Contractor shall perform a visual inspection and clean up any and all visible debris resulting from his work.

C. The asbestos-containing material shall be saturated with amended water containing a wetting agent (surfactant) before removal. Wet methods shall be used at all times during the asbestos abatement. No dry or mechanical method of removal is permitted. Drilling, breaking, pulverizing, or crushing of material shall be minimized as it may increase the possibility of fiber release. Application of an encapsulant on surfaces from which ACM was removed is required.

E. At the end of each work shift and if required during the work shift the Asbestos Abatement Contractor shall immediately clean up any visible debris in and around the regulated work area. All debris must be immediately cleaned up and bagged as necessary.

F. It shall be the responsibility of the Asbestos Abatement Contractor to verify the thickness/ quantity and complexity of the material and satisfy himself as to the total work and/or effort as required to safely complete this project. No additional payment will be considered for any deviations of the actual thickness/quantity from any thickness/quantity noted.

G. The Asbestos Abatement Contractor shall protect the existing building substrates and components from damage from tools and equipment used during Asbestos Abatement Work and subsequent encapsulation procedures. Damage to the buildings as a result of the Asbestos Abatement Contractor's negligence will require the Asbestos Abatement Contractor to repair the damage at no cost to G70.

3.05 DECONTAMINATION PROCEDURES

A. Require all Workers to adhere to the following personal decontamination procedures whenever they leave the work area and at the end of work shift:

1. Before leaving the regulated area, require the worker to remove the disposable coveralls in the designated decontamination area. Disposable coveralls are placed in a bag for disposal with other contaminated material. Respiratory protection should not be removed at this time. Tools used for asbestos abatement should be stored in the regulated area until they are

decontaminated and removed at the completion of the abatement activity.

2. The worker shall then proceed to the designated clean area or "clean" room, at which time the respiratory protection may be removed.

B. Equipment and Waste Container Decontamination: All equipment and surfaces of containers must be cleaned prior to removing from the regulated area.

Decontamination Sequence: Take all equipment or material from the work area through the decontamination area according to the following procedure:

a. At the work area, thoroughly clean sealed polyethylene bags or contaminated equipment and pass into the decontamination area.

b. Once inside the decontamination area, wet clean the bags/containers and equipment.

c. Require these workers to wear full protective clothing and appropriate respiratory protection while cleaning equipment and waste containers.

d. All bags/containers and equipment are to be transported in clean sealed containers that have never entered the work area.

C. Work Area Decontamination: At completion of the Asbestos Abatement Work, thoroughly HEPA vacuum and wet wipe all surfaces inside work area. Carefully disassemble and roll up work area polyethylene and dispose as asbestos-contaminated material. Wet clean and/or HEPA vacuum the work area to prepare the area for visual clearance and air sampling clearance by the Qualified Consultant.

3.06 DISPOSAL OF ASBESTOS-CONTAINING MATERIAL AND ASBESTOS - CONTAMINATED WASTE (SOLID AND/OR LIQUID)

A. Asbestos-containing material, asbestos contaminated material and PPE shall be double-bagged in leak tight bags with OSHA label prescribed by the HIOSH regulations referenced in these specifications. Label shall state:

DANGER

ASBESTOS FIBERS

MAY CAUSE CANCER

CAUSES DAMAGE TO LUNGS

AUTHORIZED PERSONAL ONLY

Asbestos-containing material to be transported off the facility site shall be labeled with the name of the waste generator and the location at which the waste was generated, as prescribed by EPA regulation 40 CFR 61.150 (NESHAPS). Additionally, label bags in accordance with OSHA requirement 29 CFR

1926.1101.

B. Vehicles used for transporting waste to the disposal sites shall have a completely enclosed, lockable storage compartment. Storage compartments shall be plasticized and sealed with a minimum of one layer of 6-mil polyethylene sheeting on the sides and top, and 2 layers of 6-mil polyethylene on the floor (bed). If allowed by HIOSH, waste materials, except those with sharp edges (metal lath, screws, nails, metal suspension system, etc.), properly double-bagged or wrapped may be transported to the disposal site without being placed in drums if the transporting vehicle is prepared as specified above in addition to any more stringent requirements by HIOSH. The compartments shall be thoroughly wet-cleaned and/or HEPA vacuumed following the disposal of each load at the disposal sites at an approved location with electrical power as required. At the conclusion of the asbestos abatement, or before transport vehicles are used for other purposes, the polyethylene sheeting shall be properly removed and disposed of as contaminated waste. After this has been accomplished, compartments shall once again be wet cleaned and HEPA vacuumed in order to eliminate all debris.

C. The Asbestos Abatement Contractor shall mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that signs are visible and displayed in such a manner and location that a person can easily read the legend. The legend shall conform to the NESHAP requirement specified in 40 CFR Part 61J 49(d)(1)(iii), and HAR.11-501 to 11-504.

D. Workers unloading bags at the disposal sites shall be dressed in full-body protective clothing and dual-cartridge respirators.

E. Waste disposal manifest forms shall be properly completed to assure custody and disposal of all asbestos-containing material and asbestos-contaminated waste at approved disposal sites. Forms shall be kept on file as directed by G70 with copies submitted to the Qualified Consultant the next working day after each trip.

NOTE: IT IS THE Asbestos Abatement CONTRACTOR'S RESPONSIBILITY TO ASSURE THAT ANY LANDFILL USED FOR DISPOSAL OF ASBESTOS-CONTAINING OR ASBESTOS-CONTAMINATED WASTE IS APPROVED FOR THAT PURPOSE.

F. Bags must be placed in the hole for burial. Dumping of bags from the containers will not be allowed. However, if a bag is torn and if acceptable by the landfill, the entire container may be buried.

G. Liquid waste shall not be disposed into the sanitary sewer system, filtered or unfiltered, without appropriate City and County of Honolulu permit(s).

H. The Asbestos Abatement Contractor shall pay the waste transportation and disposal charge for use of the landfills. All expenses for landfills shall be the complete responsibility of the Asbestos Abatement Contractor. The Asbestos Abatement Contractor shall provide the required advance notice of all deliveries

to the landfill(s). Delivery time shall be as directed by the landfill operator.

I. The Asbestos Abatement Contractor shall be responsible for all costs associated with disposal of asbestos waste at an approved landfill.

3.07 CLEANING OF THE WORK AREA

A. Should the Asbestos Abatement Contractor fail to commence work to clean-up and make the work area asbestos free within one working day after the clean-up has been requested by G70, G70 may without further notice and without termination of contract, do the clean-up and deduct the cost thereof from the contract price.

B. Surfaces to be encapsulated shall be wet-wiped and/or HEPA vacuumed just prior to the application of encapsulant.

C. Post-removal encapsulation of affected areas shall begin as specified hereinafter when approved by the Qualified Consultant.

3.08 POST-REMOVAL ENCAPSULATION OF AFFECTED AREAS

An approved encapsulant diluted to a maximum of 1/3 strength of the manufacturer's normal application rate for the intended substrate shall be applied using airless spray equipment to all areas where asbestos containing materials have been removed.

3.09 FINAL CLEAN-UP

A. Final clean-up may not proceed until a visual inspection for dust and debris is successfully completed by the Qualified Consultant.

B. Following visual inspection and air clearance by the Qualified Consultant, the Asbestos Abatement Contractor shall encapsulate the exposed surfaces at and adjacent to the disturbed material.

C. After final cleanup, the Qualified Consultant shall perform a visual inspection to ensure that the asbestos control and work areas are free of any accumulations of dirt, dust, or debris. Should the Qualified Consultant determine that the asbestos control and work areas do not pass the visual clearance, the Asbestos Abatement Contractor shall take appropriate actions to re-clean the area and shall repeat the visual clearance.

D. Following successful completion of visual clearance and application of encapsulant as described above, the Qualified Consultant shall perform air clearance of the contained work area. Containment shall remain under negative air pressure until receipt of successful air clearance results, as confirmed by the Qualified Consultant.

E. Following successful completion of air clearance, remove signage required by the Asbestos Abatement work. Signage applicable to job site safety and the performance of the remaining portions of the work shall remain as applicable.

F. Completely remove all plastic sheeting and negative air equipment. Clean and repair damage caused by temporary installations or use of temporary facilities. Restore existing facilities to their original condition as approved by G70.

Employee Release Form
(Sample)

Employee Name:

_____

Employee Address:

_____

Employee Telephone No.:

_____

Name of Training Center, Certificate Number and Expiration:

_____

Date: Classification of Worker:

_____

Have you had in the past or present, any respiratory problems?

Yes _____ No _____

Have you worked in the past with asbestos or fiberglass type materials?

Yes _____ No _____

The project you will be working on involves the use of asbestos and the removal of the asbestos from the building. Asbestos is considered a health hazard. The company is supplying all necessary safety clothing and working conditions required and necessary for your protection from asbestos hazard.

You shall be instructed at the commencement of the job on the required use of safety equipment, clothing, working conditions, and procedures. These must be rigidly adhered to. Smoking is not permitted in the work areas. Disregarding of safety instructions shall result in instant dismissal.

I acknowledge that safety instructions have been given to me by the company at my work commencement and I am thoroughly conversant with them and I have answered the above questions truthfully.

Signed (Employee) Date:

_____ _____

CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT

PROJECT NAME: _____ DATE: _____
PROJECT ADDRESS: _____
CONTRACTORS NAME: _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with G70 for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project, you must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

Physical characteristics of asbestos
Health hazards associated with asbestos
Respiratory protection
Use of protective equipment
Pressure Differential Systems
Work practices including hand on or on-job training
Personal decontamination procedures
Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only G70 has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature _____ Social Security Number_____

Printed Name _____ Witness _____

END OF SECTION

Gamma Medical Physics LLC
850 W. Hind Drive Ste 214, Honolulu, HI 96821

An APEX Physics Partner

Report of Shielding Design Evaluation

Facility:	Kauai Veterans Memorial Hospital Radiographic Room 1	Date: June 27, 2021
Address:	4643 Waimea Canyon Dr. Waimea, HI 96796	
Performed by:	Ronald Frick, M.S., CHP, DABR	

Introduction

An evaluation of the shielding requirements for a radiographic x-ray room was performed according to the procedures and recommendations of the National Council on Radiation Protection and Measurements Report No. 147, *Structural Shielding Design for Medical X-Ray Imaging Facilities.*

For this evaluation, room dimensions, sizes, and layouts were obtained from Group 70 International, Inc.. Drawings showing the sizes and layouts of the x-ray room and the uses of areas surrounding the room are attached to this report.

General Requirements

1. Steel nails or screws used to secure lead barriers need not be covered with lead discs or supplementary lead. Steel nails or screws generally attenuate radiation equally, or more effectively, than the displaced lead.

2. Where the edges of two lead sheets meet, there should be an overlap of at least 1 cm.

3. Lead shielding should be installed to a height of at least 7 feet from the finished floor.

4. Viewing windows should be made from lead glass or lead acrylic of the same shielding effectiveness as the wall in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Frames for viewing windows should have lead installed in them that overlaps the lead glass or lead acrylic.

5. Doors should be have the same shielding effectiveness as the walls in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Door frames should have lead installed in them so there is an overlap over the door edge around the entire door jamb.

6. Shielding should be constructed so there are no voids from penetrations for pipes, conduits, wall outlets, or ducts. Where wall outlets, pipes, ducts, or conduits penetrate the shielding, they shall be covered with additional lead that overlaps the edges of the opening in the shielding. Where possible, penetrations of shielding should occur only in secondary barriers.

7. A Radiation Protection Survey of the finished room shall be performed by a qualified Medical Physicist within six months after installation of the x-ray equipment.

Assumptions and Formulas Used

1. The workload and kVp distribution are taken as that which represents a practical value for the specified use. Unless site specific data is available, workloads corresponding to a busy facility, as described in NCRP 147, are used.

2. Values for Occupancy Factors and Use Factors were assigned according to the function and occupancy of each surrounding area given in NCRP Report No. 147.

3. In keeping with the ALARA recommendations of the National Council on Radiation Protection and Measurements Report No. 116, Limitation of Exposure to Ionizing Radiation, maximum allowable weekly exposures were set to 0.1 mGy/week for occupational workers and 0.02 mGy/week for non-occupational workers. Maximum weekly exposures for unexposed film storage locations were set to 0.025 mGy/week. For locations where loaded cassettes will be stored, maximum weekly exposures were set to 0.0025 mGy/week.

4. The following formulas were used for calculation of required additional shielding, as described in NCRP Report No. 147:

   For the Chest bucky wall, the required thicknesses for the primary barrier directly behind the bucky is calculated. The shielding thickness required to shield the area next to the bucky from scattered radiation is also calculated. The larger of these two thicknesses is used for the entire wall. Formulas for primary and secondary barrier are shown below:

$$x_{Pri} = \frac{1}{\alpha\gamma} \ln\left(\frac{\left(\frac{Z_{Pri} TU}{P}\right)^{\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}}\right) - x_{pre}$$

$$Z_{Pri} = \frac{N_{Rad} K_{P(Chest)}}{d^2_{P(Chest)}}$$

$$x_{Sec} = \frac{1}{\alpha\gamma} \ln\left(\frac{\left(\frac{Z_{Sec} T}{P}\right)^{\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}}\right)$$

$$Z_{Sec} = \frac{N_{Rad} K_{SL(Table)}}{d^2_{S(Table)}} + \frac{N_{Rad} K_{S(Chest)}}{d^2_{S(C.Bucky)}} + \frac{N_{Rad} K_{L(Chest)}}{d^2_{L(C.Tube)}}$$

Where:

- P is the permissible weekly exposure in mGy per week;
- N is the number of patients per week(for either Radiographic or Fluoroscopic exams);
- T is the Occupancy Factor;
- U is the Use Factor *(Note: no use factor is necessary for chest bucky barriers, since this factor is built into the K value for this type of barrier)*;
- d_P is the distance from the tube to the point in question (one foot beyond indicated wall);
- d_S is the distance from the scatter source to the point in question (one foot beyond indicated wall);
- d_L is the distance from the tube (source of leakage radiation) to the point in question;
- x is the shield thickness;
- x_{pre} is the amount of pre-shielding provided by the imaging hardware, taken from Table 4.6 of NCRP 147;
- K_P is the primary radiation exposure at a distance of one meter from the x-ray tube, in units of mGy per patient, which is dependent on the room type and barrier type, taken from Table 4.5 of NCRP 147;
- K_{SL} is the secondary radiation exposure (including scatter and leakage) at a distance of one meter from the patient, in units of mGy per patient, which is dependent on the room type, taken from table 4.7 of NCRP 147; and
- α,β,γ are parameters dependent on shielding material and kVp distribution, and are taken from Appendices B and C of NCRP 147.

For the cross-table wall, contributions from primary and secondary radiation are considered. Due to the variables involved, the required shielding thickness for a particular target dose rate cannot be calculated directly. Instead, a particular shielding thickness is assumed, and the projected dose rate is calculated and compared to the target dose rate. The shielding thickness is adjusted until the projected dose rate is below the target dose rate. There are two different sources for secondary radiation which are considered for the cross table wall: (1) Scatter and leakage from radiographic patients examined on the table, and (2) Scatter and leakage from radiographic patients examined with the chest bucky. Dose contributions are calculated separately from each source and added together to determine D_{Sec}. Formulas are shown below:

$$D_{Proj} = D_{Pri} + D_{Sec}$$

$$D_{Pri} = \frac{N_{Rad} T K_{P(Rad)} U}{d_{P(cross)}^2} \left[\left(1 + \frac{\beta}{\alpha}\right) \left(e^{(x + x_{pre})\alpha\gamma} - \frac{\beta}{\alpha}\right) \right]^{-\frac{1}{\gamma}}$$

$$D_{Sec} = \frac{N_{Rad} T K_{SL(Rad)} U}{d_{SL}^2} \left[\left(1 + \frac{\beta}{\alpha}\right) \left(e^{x\alpha\gamma} - \frac{\beta}{\alpha}\right) \right]^{-\frac{1}{\gamma}}$$

For the floor beneath the table, primary radiation from the overhead tube is the only consideration. For the floor areas away from the table, scatter and leakage from radiographic patients is the only consideration. The required thicknesses due to primary and secondary radiation are calculated separately, and the larger of the two values is reported. Formulas are similar to those shown for the chest bucky wall.

For the ceiling, scatter and leakage from radiographic patients is the only consideration. Formulas are similar to those used for chest bucky wall secondary barrier calculation.

For walls not described above, there are two different sources for secondary radiation which are considered: (1) Scatter and leakage from radiographic patients examined on the table, and (2) Scatter and leakage from radiographic patients examined using the chest bucky. Formulas are similar to those used above.

Data and Results

Workload assumptions
Room Type: Radiographic
Patients per week(Radiographic): 160

Note: The data in the tables below is presented to show results of calculations performed. ***Shielding thicknesses should not be taken from these tables.*** *Recommended shielding thicknesses may vary from the values in this table. Refer to 'Specific Shielding Requirements' below for actual shielding requirements.*

Chest wall

Wall	Pri Dist. (m)	Sec Dist. (bucky to wall) (m)	Sec Dist. (table to wall) (m)	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
A	2.44	0.76	3.05	0.20	0.02	0.60	2	1.72

Cross table wall

Wall	Sec Dist. (table) (m)	Pri Dist. (m)	Sec Dist. (chest bucky) (m)	U	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
B	1.83	2.59	2.74	0.09	1	0.02	0.64	2	2.00

Other walls

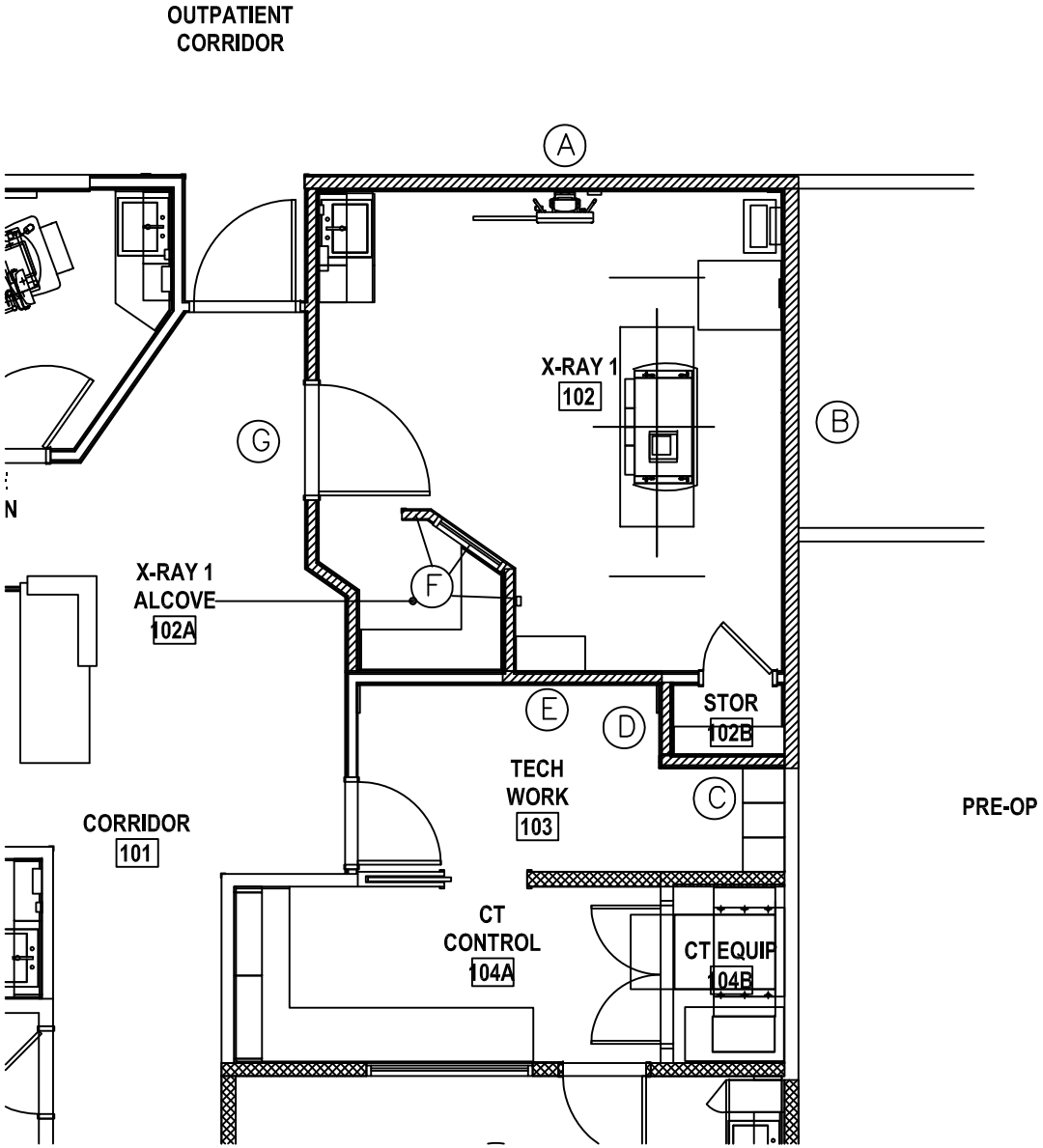
Wall	Dist. (Table) (m)	Dist. (Chest bucky) (m)	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
C	3.96	6.40	1	0.02	0.26	2	0.96
D	3.05	5.49	1	0.02	0.36	2	1.26
E	3.05	5.49	1	0.02	0.36	2	1.26
F	2.59	3.96	1	0.1	0.15	2	0.58
G	3.96	3.05	0.2	0.02	0.08	2	0.34

Specific Shielding Requirements

1. All walls A-G shall have at least 2 lb/ft^2 lead shielding as shown in the attached drawing.

2. The viewing window in wall F shall have a minimum shielding equivalence of 0.8 mm lead.

3. The door installed in wall G shall be provided with a minimum of 2 lb/ft^2 lead shielding.



Kauai Veterans Memorial Hospital
4643 Waimea Canyon Dr, Waimea, HI 96796

2 lb/sqft lead

Gamma Medical Physics LLC
850 W. Hind Drive Ste 214, Honolulu, HI 96821

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Report of Shielding Design Evaluation

Facility:	Kauai Veterans Memorial Hospital Rad/Fluoro Room 2	Date: June 26, 2021
Address:	4643 Waimea Canyon Dr. Waimea, HI 96796	
Performed by:	Ronald Frick, M.S., CHP, DABR	

Introduction

An evaluation of the shielding requirements for a radiographic & fluoroscopic x-ray room was performed according to the procedures and recommendations of the National Council on Radiation Protection and Measurements Report No. 147, *Structural Shielding Design for Medical X-Ray Imaging Facilities.*

For this evaluation, room dimensions, sizes, and layouts were obtained from Group 70 International, Inc.. Drawings showing the sizes and layouts of the x-ray rooms and the uses of areas surrounding the rooms are attached to this report.

General Requirements

1. Steel nails or screws used to secure lead barriers need not be covered with lead discs or supplementary lead. Steel nails or screws generally attenuate radiation equally, or more effectively, than the displaced lead.

2. Where the edges of two lead sheets meet, there should be an overlap of at least 1 cm.

3. Lead shielding should be installed to a height of at least 7 feet from the finished floor.

4. Viewing windows should be made from lead glass or lead acrylic of the same shielding effectiveness as the wall in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Frames for viewing windows should have lead installed in them that overlaps the lead glass or lead acrylic.

5. Doors should be have the same shielding effectiveness as the walls in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Door frames should have lead installed in them so there is an overlap over the door edge around the entire door jamb.

6. Shielding should be constructed so there are no voids from penetrations for pipes, conduits, wall outlets, or ducts. Where wall outlets, pipes, ducts, or conduits penetrate the shielding, they shall be covered with additional lead that overlaps the edges of the opening in the shielding. Where possible, penetrations of shielding should occur only in secondary barriers.

7. A Radiation Protection Survey of the finished room shall be performed by a qualified Medical Physicist within six months after installation of the x-ray equipment.

Assumptions and Formulas Used

1. The workload and kVp distribution are taken as that which represents a practical value for the specified use. Unless site specific data is available, workloads corresponding to a busy facility, as described in NCRP 147, are used.

2. Values for Occupancy Factors and Use Factors were assigned according to the function and occupancy of each surrounding area given in NCRP Report No. 147.

3. In keeping with the ALARA recommendations of the National Council on Radiation Protection and Measurements Report No. 116, Limitation of Exposure to Ionizing Radiation, maximum allowable weekly exposures were set to 0.1 mGy/week for occupational workers and 0.02 mGy/week for non-occupational workers. Maximum weekly exposures for unexposed film storage locations were set to 0.025 mGy/week. For locations where loaded cassettes will be stored, maximum weekly exposures were set to 0.0025 mGy/week.

4. The following formulas were used for calculation of required additional shielding, as described in NCRP Report No. 147:

   For the Chest bucky wall, the required thicknesses for the primary barrier directly behind the bucky is calculated. The shielding thickness required to shield the area next to the bucky from scattered radiation is also calculated. The larger of these two thicknesses is used for the entire wall. Formulas for primary and secondary barrier are shown below:

$$x_{Pri} = \frac{1}{\alpha\gamma} \ln\left(\frac{\left(\frac{Z_{Pri} TU}{P}\right)^{\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}}\right) - x_{pre}$$

$$Z_{Pri} = \frac{N_{Rad} K_{P(Chest)}}{d^2_{P(Chest)}}$$

$$x_{Sec} = \frac{1}{\alpha\gamma} \ln\left(\frac{\left(\frac{Z_{Sec} T}{P}\right)^{\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}}\right)$$

$$Z_{Sec} = \frac{N_{Rad} K_{SL(Table)}}{d^2_{S(Table)}} + \frac{N_{Rad} K_{S(Chest)}}{d^2_{S(C.Bucky)}} + \frac{N_{Rad} K_{L(Chest)}}{d^2_{L(C.Tube)}} + \frac{N_{Fluoro} K_{SL(Fluoro)}}{d^2_{S(Table)}} + \frac{N_{Fluoro} K_{SL(Rad)}}{d^2_{S(Table)}}$$

Where:

P	is the permissible weekly exposure in mGy per week;
N	is the number of patients per week(for either Radiographic or Fluoroscopic exams);
T	is the Occupancy Factor;
U	is the Use Factor *(Note: no use factor is necessary for chest bucky barriers, since this factor is built into the K value for this type of barrier)*;
d_P	is the distance from the tube to the point in question (one foot beyond indicated wall);
d_S	is the distance from the scatter source to the point in question (one foot beyond indicated wall);
d_L	is the distance from the tube (source of leakage radiation) to the point in question;
x	is the shield thickness;
x_{pre}	is the amount of pre-shielding provided by the imaging hardware, taken from Table 4.6 of NCRP 147;
K_P	is the primary radiation exposure at a distance of one meter from the x-ray tube, in units of mGy per patient, which is dependent on the room type and barrier type, taken from Table 4.5 of NCRP 147;
K_{SL}	is the secondary radiation exposure (including scatter and leakage) at a distance of one meter from the patient, in units of mGy per patient, which is dependent on the room type, taken from table 4.7 of NCRP 147; and
α,β,γ	are parameters dependent on shielding material and kVp distribution,

and are taken from Appendices B and C of NCRP 147.

For the cross-table wall, contributions from primary and secondary radiation are considered. Due to the variables involved, the required shielding thickness for a particular target dose rate cannot be calculated directly. Instead, a particular shielding thickness is assumed, and the projected dose rate is calculated and compared to the target dose rate. The shielding thickness is adjusted until the projected dose rate is below the target dose rate. There are four different sources for secondary radiation which are considered for the cross table wall: (1) Scatter and leakage from radiographic patients examined on the table, (2) Scatter and leakage from radiographic patients examined with the chest bucky, (3) scatter and leakage from use of the fluoroscopic tube on fluoroscopic patients, and (4) scatter and leakage from use of the radiographic tube on fluoroscopic patients. Dose contributions are calculated separately from each source and added together to determine D_{Sec}. Formulas are shown below:

$$D_{Proj} = D_{Pri} + D_{Sec}$$

$$D_{Pri} = \frac{N_{Rad} T K_{P(Rad)} U}{d_{P(cross)}^2} \left[\left(1 + \frac{\beta}{\alpha}\right) \left(e^{(x + x_{pre})\alpha\gamma} - \frac{\beta}{\alpha}\right) \right]^{-\frac{1}{\gamma}}$$

$$D_{Sec} = \frac{N_{Rad} T K_{SL(Rad)} U}{d_{SL}^2} \left[\left(1 + \frac{\beta}{\alpha}\right) \left(e^{x\alpha\gamma} - \frac{\beta}{\alpha}\right) \right]^{-\frac{1}{\gamma}}$$

For the floor beneath the table, contributions from primary(from overhead tube) and secondary radiation (from under-table fluoro tube) are considered. Due to the variables involved, the required shielding thickness for a particular target dose rate cannot be calculated directly. Instead, a particular shielding thickness is assumed, and the projected dose rate is calculated and compared to the target dose rate. The shielding thickness is adjusted until the projected dose rate is below the target dose rate. There are two different sources for primary radiation which are considered for the floor beneath the table: (1) Primary radiation from radiographic patients examined on the table, (2) Primary radiation from use of the radiographic tube on fluoroscopic patients. Dose contributions are calculated separately from each source and added together to determine D_{Pri}. Formulas are the same as shown for the cross table wall.

For the ceiling, and for floor areas away from the table, there are three different sources for secondary radiation which are considered: (1) Scatter and leakage from radiographic patients, (2) Scatter and leakage from fluoroscopic patients examined with the overhead tube, (3) scatter and leakage from use of the fluoroscopic tube on fluoroscopic patients. Formulas are similar to those used for chest bucky wall secondary barrier calculation.

For walls not described above, there are four different sources for secondary radiation which are considered: (1) Scatter and leakage from radiographic patients examined on the table, (2) Scatter and leakage from radiographic patients examined using the chest bucky, (3) Scatter and leakage from fluoroscopic patients examined with the overhead tube, (4) scatter and leakage from use of the fluoroscopic tube on fluoroscopic patients. Formulas are similar to those used above.

Data and Results

Workload assumptions
Room Type: Radiographic & Fluoroscopic
Patients per week(Radiographic): 120
Patients per week (Fluoroscopic): 30

Note: The data in the tables below is presented to show results of calculations performed. Shielding thicknesses should not be taken from this table. Recommended shielding thicknesses may vary from the values in this table. Refer to 'Specific Shielding Requirements' below for actual shielding requirements.

Chest wall

Wall	Pri Dist. (m)	Sec Dist. (bucky to wall) (m)	Sec Dist. (table to wall) (m)	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
A	2.44	0.76	3.35	1	0.02	1.14	4	3.31

Cross table wall

Wall	Sec Dist. (table) (m)	Pri Dist. (m)	Sec Dist. (chest bucky) (m)	U	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
B	2.29	3.05	2.29	0.09	0.2	0.02	0.58	2	1.83

Other walls

Wall	Dist. (Table) (m)	Dist. (Chest bucky) (m)	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
C	2.59	5.33	0.2	0.02	0.45	2	1.54
D	2.74	3.96	0.2	0.02	0.42	2	1.46
E	2.74	3.96	0.2	0.02	0.42	2	1.46
F	2.74	2.29	1	0.1	0.44	2	1.49
G	4.72	4.88	1	0.02	0.57	2	1.89

Specific Shielding Requirements

1. The existing 10 inch concrete of wall A will provide adequate shielding.

2. Walls B - G shall have at least 2 lb/ft^2 lead shielding.

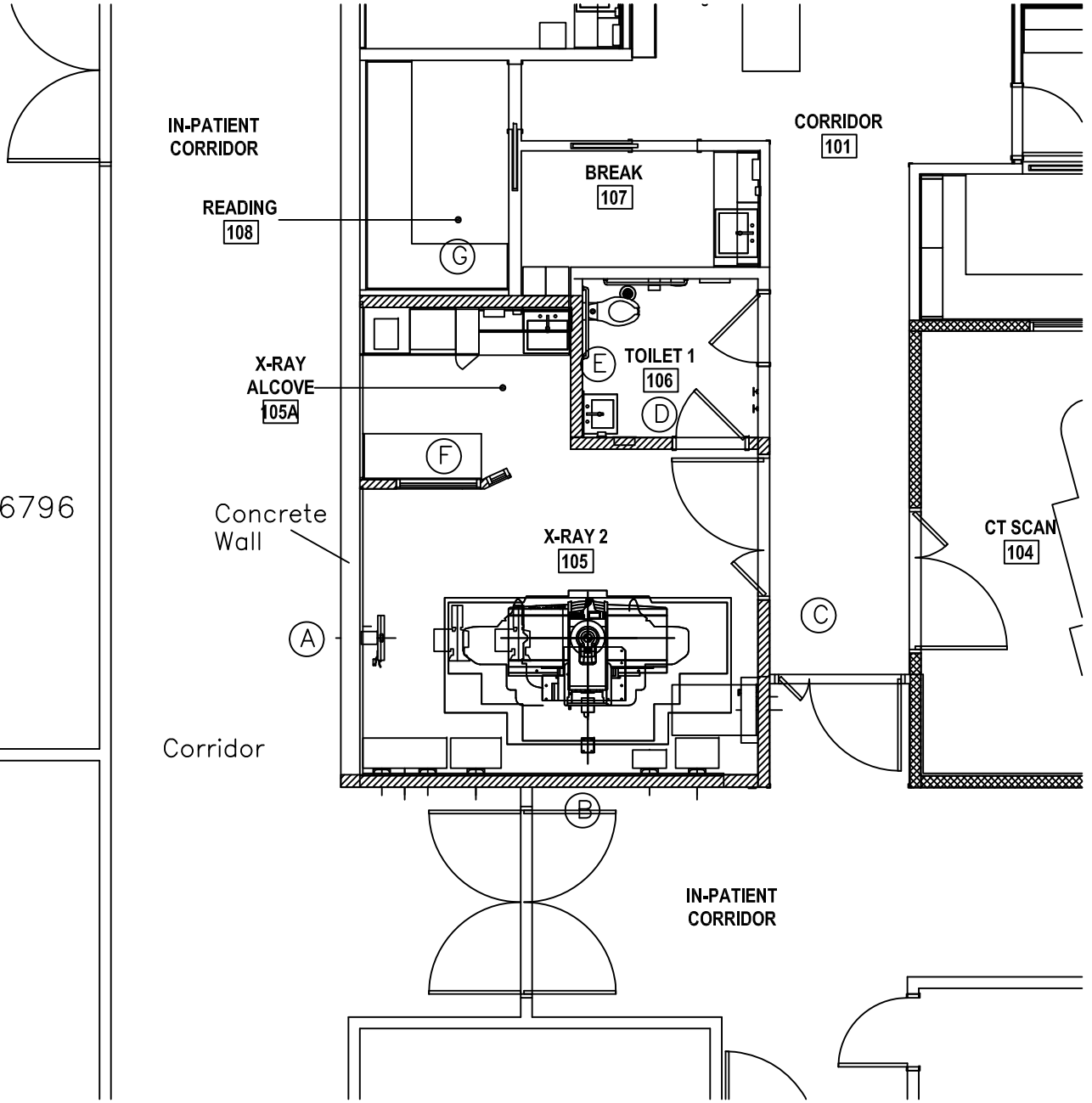
3. The doors installed in wall C shall be provided with a minimum of 2 lb/ft^2 lead shielding. One of the leaves of the double door installed in wall C shall have a lead astragal attached which overlaps the other leaf when closed.

4. The door installed in wall D shall be provided with a minimum of 2 lb/ft^2 lead shielding.

5. The viewing windows in wall F shall have a minimum shielding equivalence of 0.8 mm lead.

Kauai Veterans Memorial Hospital
4643 Waimea Canyon Dr, Waimea, HI 96796

2 lb/sqft lead



Gamma Medical Physics LLC
850 W. Hind Drive Ste 214, Honolulu, HI 96821

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Report of Shielding Design Evaluation

Facility: Kauai Veterans Memorial Hospital
CT Room

Date: June 26, 2021

Address: 4643 Waimea Canyon Dr.
Waimea, HI 96796

Performed by: Ronald Frick, M.S., CHP, DABR

Introduction

An evaluation of the shielding requirements for a computed tomography room was performed according to the procedures and recommendations of the National Council on Radiation Protection and Measurements Report No. 147, *Structural Shielding Design for Medical X-Ray Imaging Facilities.*

For this evaluation, room dimensions, sizes, and layouts were obtained from Group 70 International, Inc.. Drawings showing the sizes and layouts of the x-ray rooms and the uses of areas surrounding the rooms are attached to this report.

General Requirements

1. Steel nails or screws used to secure lead barriers need not be covered with lead discs or supplementary lead. Steel nails or screws generally attenuate radiation equally, or more effectively, than the displaced lead.

2. Where the edges of two lead sheets meet, there should be an overlap of at least 1 cm.

3. Lead shielding should be installed to a height of at least 7 feet from the finished floor, unless otherwise specified in the Specific Shielding Requirements.

4. Viewing windows should be made from lead glass or lead acrylic of the same shielding effectiveness as the wall in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Frames for viewing windows should have lead installed in them that overlaps the lead glass or lead acrylic.

5. Doors should have the same shielding effectiveness as the walls in which they are installed, unless otherwise specified in the Specific Shielding Requirements. Door frames should have lead installed in them so there is an overlap over the door edge

around the entire door jamb.

6. Shielding should be constructed so there are no voids from penetrations for pipes, conduits, wall outlets, or ducts. Where wall outlets, pipes, ducts, or conduits penetrate the shielding, they shall be covered with additional lead that overlaps the edges of the opening in the shielding. Where possible, penetrations of shielding should occur only in secondary barriers.

7. A Radiation Protection Survey of the finished room shall be performed by a qualified Medical Physicist within six months after installation of the x-ray equipment.

Assumptions and Formulas Used

1. The workload and kVp distribution are taken as that which represents a practical value for the specified use. Unless site specific data is available, workloads corresponding to a busy facility, as described in NCRP 147, are used.

2. Values for Occupancy Factors and Use Factors were assigned according to the function and occupancy of each surrounding area given in NCRP Report No. 147.

3. In keeping with the ALARA recommendations of the National Council on Radiation Protection and Measurements Report No. 116, Limitation of Exposure to Ionizing Radiation, maximum allowable weekly exposures were set to 0.1 mGy/week for occupational workers and 0.02 mGy/week for non-occupational workers. Maximum weekly exposures for unexposed film storage locations were set to 0.025 mGy/week. For locations where loaded cassettes will be stored, maximum weekly exposures were set to 0.0025 mGy/week.

4. The following formulas were used for calculation of required additional shielding, as described in NCRP Report No. 147:

$$K_{Head} = k_{Head} \times DLP_{Head}$$

$$K_{Body} = 1.2 \times k_{Body} \times DLP_{Body}$$

$$K_S = K_{Head} \times N_{Head} \times (1 + F_{Head}) + K_{Body} \times N_{Body} \times (1 + F_{Body})$$

Where:

K_{Head} is the secondary radiation exposure for a head scan at a distance of one

meter from isocenter, in units of mGy per procedure;

K_{Body} is the secondary radiation exposure for a body scan at a distance of one meter from isocenter, in units of mGy per procedure;

K_S is the total radiation exposure at a distance of one meter from the isocenter, in units of mGy per week;

k is the scatter fraction per centimeter for the peripheral axis of the FDA head and body phantoms, assumed to be $9x10^{-5}$ cm^{-1} for the head phantom and $3x10^{-4}$ cm^{-1} for the body phantom;

DLP is the dose length product, assumed to be 1,200 mGy-cm for head scans and 1000 mGy-cm for body scans;

N is the number of patients per week for each type of scan;

F is the fraction of procedures which are repeated with contrast, assumed to be 0.4 for body procedures and 0.4 for head procedures.

$$x = \frac{1}{\alpha\gamma} \ln\left(\frac{\left(\frac{TK_S}{Pd_{sec}^2}\right)^{\gamma} + \frac{\beta}{\alpha}}{1 + \frac{\beta}{\alpha}}\right)$$

Where:

P is the permissible weekly exposure in mGy per week;

T is the Occupancy Factor;

d_{sec} is the distance from the isocenter to the point in question (one foot beyond indicated wall);

x is the shield thickness;

α,β,γ are parameters dependent on shielding material and kVp distribution, and are taken from Appendices B and C of NCRP 147.

Data and Results

Workload assumptions
Room Type: Computed Tomography
Head procedures per week: 60
Body procedures per week: 80

Note: The data in the table below is presented to show results of calculations performed. ***Shielding thicknesses should not be taken from this table.*** *Recommended shielding thicknesses may vary from the values in this table. Refer to 'Specific Shielding Requirements' below for actual shielding requirements.*

Wall	Distance (ft)	Distance (m)	T	P (mGy/wk)	Lead (mm)	Lead (lb/ft^2)	Concrete (in)
A	14.0	4.27	1	0.1	0.72	2	3.0
B	12.0	3.66	0.2	0.02	0.82	4	3.3
C	7.5	2.29	0.2	0.02	1.15	4	4.2
D	16.5	5.03	1	0.02	1.16	4	4.2
E	10.0	3.05	1	0.02	1.55	4	5.3
F	21.0	6.40	1	0.02	0.99	4	3.8

Specific Shielding Requirements

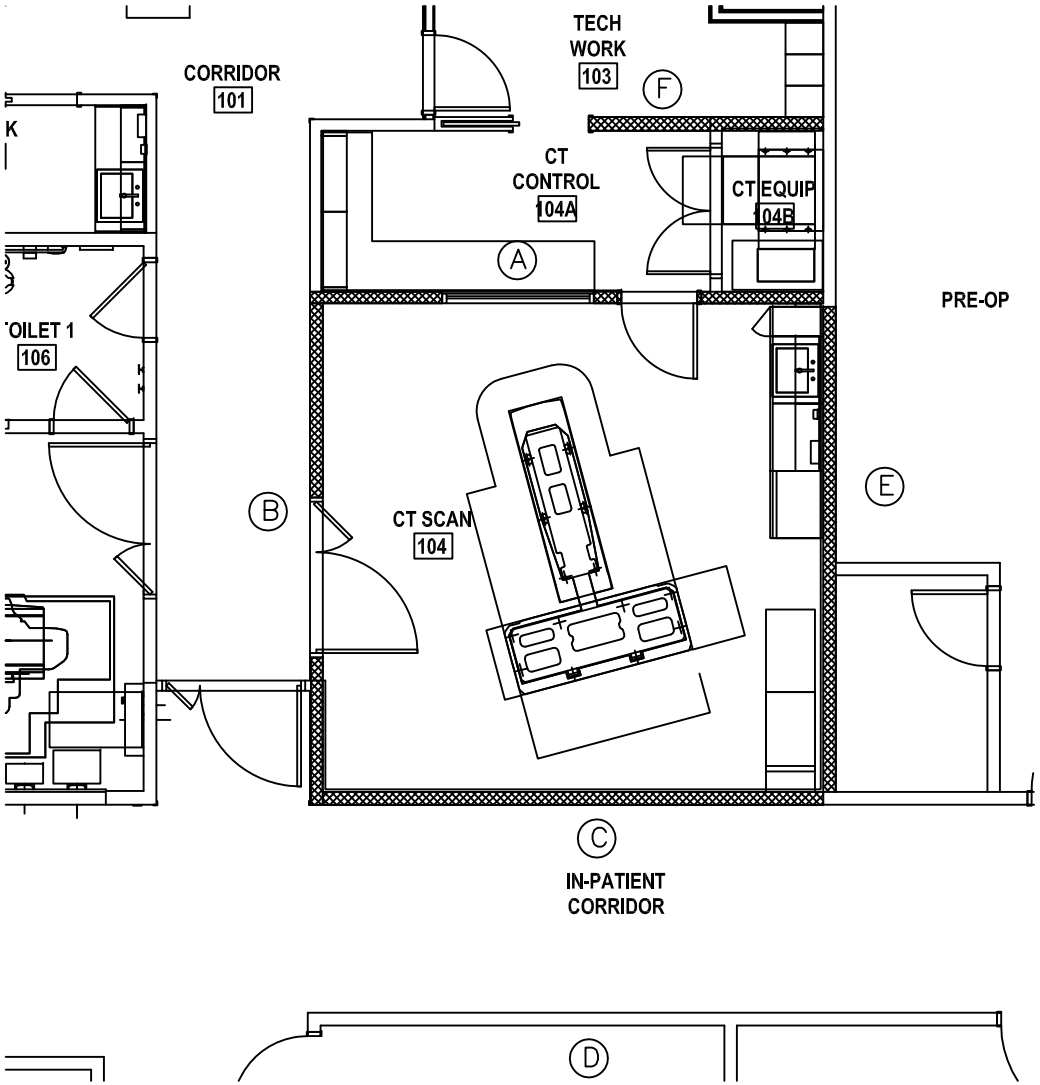
1. Wall A shall have 4 lb/ft^2 lead shielding added. The viewing window in wall A shall have a minimum shielding equivalence of 1.5 mm lead. The door installed in wall A shall be provided with a minimum of 4 lb/ft^2 lead shielding.

2. Wall B shall have 4 lb/ft^2 lead shielding added. The door installed in wall B shall be provided with a minimum of 4 lb/ft^2 lead shielding. One of the leaves of the double door installed in wall B shall have a lead astragal attached which overlaps the other leaf when closed.

3. Wall C shall have 4 lb/ft^2 lead shielding added. This shielding will provide adequate shielding for location D.

4. Wall E shall have 4 lb/ft^2 lead shielding added.

5. Wall F shall have 4 lb/ft^2 lead shielding added.



Kauai Veterans Memorial Hospital
4643 Waimea Canyon Dr, Waimea, HI 96796

4 lb/sqft lead

August 11, 2021

Ms. Kendyl Mitsui
G70
111 South King Street, Suite 170
Honolulu, Hawaii

RE: Limited Asbestos and Paint Sampling and Analysis
Kauai Veterans Memorial Hospital, Radiology Suite
4643 Waimea Canyon Drive
Waimea, Hawaii
ENPRO Project Number: 2107-00256-HAZ

Dear Ms. Mitsui,

This letter is regarding the limited asbestos and paint sampling and analysis, conducted on July 26 and August 3, 2021 at the above-referenced property. The purpose of this project was to collect and analyze samples of certain suspect asbestos-containing materials (ACM) and collect interior paint chip samples for total lead analysis. Sampling focused on materials which may be disturbed during renovation activities.

Asbestos

Specific materials for asbestos sampling and analysis included:

- Vinyl floor tile assembly throughout the radiology suite
- Linoleum floor tile assembly in the CT Scan and CT Control Rooms
- Drywall wall assembly in the CT Scan Room and Bathrooms 1 and 2
- Acoustic ceiling tiles in the CT Scan and X-Ray 2 Rooms
- Covebase and associated mastics throughout the radiology suite
- Wallpaper and associated mastics in the CT Scan Room, Mammography Department, and corridor
- Thermal insulation in the CT Scan Room
- Ceramic floor tile assembly in Bathroom 1
- Ceramic wall tile assembly in Bathroom 1
- Caulking in Bathrooms 1 and 2
- Wood laminate and associated mastics in the Nurse and Tech Work Stations

Three samples of each suspect material were collected by a State of Hawaii Department of Health (DOH) certified asbestos inspector (HIASB certification #5052) and submitted to an independent laboratory for asbestos analysis.

The suspect asbestos samples were analyzed by polarized light microscopy using Environmental Protection Agency (EPA) Method 600/M4-82-020 by Hawaii Analytical Laboratory, LLC, National Voluntary Laboratory Accreditation Program accredited laboratory. The results for the samples are listed in the following table:

Table 1

Asbestos Sampling Locations and Analytical Results

SAMPLE NUMBER	LOCATION	MATERIAL	ASBESTOS DETECTED
A1 (a, b*, c*)	**Corridor**	**Black mastic** **Orange vinyl floor tile**	**Yes** **Yes**
A2 (a*, b, c*)	**CT Scan** **CT Control**	White/gray linoleum Yellow mastic **Black mastic** Gray leveling compound	No No **Yes** No
A3 (a, b, c)	X-Ray 1	White/blue vinyl floor tile Yellow mastic	No No
A4 (a, b*, c*)	**X-Ray 1** **Ultrasound**	Light blue vinyl floor tile **Yellow/black mastics**	No **Yes**
A5 (a, b*, c*)	**Corridor**	**Black mastic** **Light brown vinyl floor tile**	**Yes** **Yes**
A6 (a, b*, c*)	**X-Ray 2** **Bathroom 2**	**Black mastic** **Dark brown vinyl floor tile**	**Yes** **Yes**
A7 (a, b*, c*)	**Mammography**	Light pink vinyl floor tile **Yellow/black mastics**	No **Yes**
A8 (a, b*, c*)	**Mammography**	Dark pink vinyl floor tile **Yellow/black mastics**	No **Yes**
A9 (a, b, c)	CT Scan Bathroom 2 Bathroom 3	White drywall White joint compound/white paint	No No
A10 (a, b, c)	CT Scan X-Ray 2	White/gray ceiling tile	No
A11 (a*, b, c*)	**Corridor** **Nurse Station**	Pink covebase Yellow mastic **Brown mastic**	No No **Yes**

BOLD – Asbestos containing material
*This sample is assumed to contain asbestos due to the laboratory-confirmed presence of asbestos in a sample collected from a homogeneous material.

Table 1 (continued)
Asbestos Sampling Locations and Analytical Results

SAMPLE NUMBER	LOCATION	MATERIAL	ASBESTOS DETECTED
A12 (a, b, c)	CT Scan Ultrasound	Blue wallpaper	No
A13 (a, b, c)	Mammography	Pink wallpaper	No
A14 (a*, b*, c)	**Reading Ultrasound**	Blue covebase Yellow mastic **Brown mastic**	No No **Yes**
A15 (a, b*, c*)	**Tech Work Station**	Dark blue vinyl floor tile **Yellow/black mastics**	No **Yes**
A16 (a, b*, c*)	**X-Ray 2**	**Brown mastic** White covebase Yellow mastic	**Yes** No No
A17 (a*, b*, c)	**X-Ray 1**	Tan covebase Yellow mastic **Brown mastic**	No No **Yes**
A18 (a, b, c)	CT Scan	Pink insulation Silver/tan wrap	No No
A19 (a, b, c)	Bathroom 1	Gray grout	No
A20 (a, b, c)	Bathroom 1	White grout	No
A21 (a, b, c)	Bathroom 1 Bathroom 2	White caulk	No
A22 (a, b, c)	Corridor	Brown wallpaper	No
A23 (a, b, c)	X-Ray 2 Tech Work Station	Blue wood laminate Green adhesive Red adhesive Yellow wood laminate	No No No No
A-24 (a, b, c)	Nurse Station	Blue wood laminate Red adhesive (1) Red adhesive (2) Red wood laminate Blue wood laminate Red adhesive Green adhesive	No No No No No No No

BOLD – Asbestos containing material
*This sample is assumed to contain asbestos due to the laboratory-confirmed presence of asbestos in a sample collected from a homogeneous material.

Based on the analytical results, the following materials from Kauai Veterans Memorial Hospital, Radiology Suite were determined to be asbestos containing:

- Black mastic in the corridor, 5% chrysotile
- Orange vinyl floor tile in the corridor, <1% chrysotile
- Black mastic in the CT Scan and CT Control rooms, 4% chrysotile
- Yellow-black mastics in the X-Ray 1 and Ultrasound Rooms, 3% chrysotile
- Black mastic in the corridor, 5% chrysotile
- Light brown vinyl floor tile in the corridor, 2% chrysotile
- Black mastic in the X-Ray 2 Room and Bathroom 2, 7% chrysotile
- Dark brown vinyl floor tile in the X-Ray 2 Room and Bathroom 2, 2% chrysotile
- Yellow/black mastics in the Mammography Department, 3% chrysotile
- Yellow/black mastics in the Mammography Department, 2% chrysotile
- Brown mastic in the Nurse Station and the corridor, 2% chrysotile
- Brown mastic in the Reading and Ultrasound Rooms, 2% chrysotile
- Yellow/black mastics in the Tech Work Station, 3% chrysotile
- Brown mastic in the X-Ray 2 Room, 2% chrysotile
- Brown mastic in the X-Ray 1 Room, 2 % chrysotile

Table 2
Sampled ACM Assessment Summary and Quantity

SAMPLE NUMBER	MATERIAL/ FRIABILITY/CONDITION**	POTENTIAL FOR DISTURBANCE* Contact/Erosion/Vibration	ESTIMATED QUANTITY
A-1	Mastic, black, (5% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	48 ft^2
	Vinyl floor tile, orange, (<1% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	48 ft^2

*An assessment of "High" in any of the three categories, (Contact, Erosion, or Vibration), represents the potential for Significant Damage. An assessment of "Moderate" in any of the three categories represents the potential for Damage. An assessment of "Low" in all of the three categories represents a low potential for damage.
**Damage is defined as the loss of adhesion or cohesion. Significant Damage is defined as greater than ten percent distributed Damage or greater than twenty-five percent localized Damage.

Table 2 (continued)
Sampled ACM Assessment Summary and Quantity

SAMPLE NUMBER	MATERIAL/ FRIABILITY/CONDITION**	POTENTIAL FOR DISTURBANCE* Contact/Erosion/Vibration	ESTIMATED QUANTITY
A-2	Mastic, black, (4% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	289 ft^2
A-4	Mastic, yellow/black, (3% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	142 ft^2
A-5	Mastic, black, (5% chrysotile), non-friable, damaged	High/High/High (with knowledge of future demolition activities)	426 ft^2
	Vinyl floor tile, light brown, (2% chrysotile), non-friable, damaged	High/High/High (with knowledge of future demolition activities)	426 ft^2
A-6	Mastic, black, (7% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	344 ft^2
	Vinyl floor tile, dark brown, (2% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	344 ft^2
A-7	Mastic, black, (3% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	122 ft^2
A-8	Mastic, black, (2% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	44 ft^2
A-11	Mastic, brown, (5% chrysotile), non-friable, damaged	High/High/High (with knowledge of future demolition activities)	138 ft
A-14	Mastic, brown, (2% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	176 ft

*An assessment of "High" in any of the three categories, (Contact, Erosion, or Vibration), represents the potential for Significant Damage. An assessment of "Moderate" in any of the three categories represents the potential for Damage. An assessment of "Low" in all of the three categories represents a low potential for damage.
**Damage is defined as the loss of adhesion or cohesion. Significant Damage is defined as greater than ten percent distributed Damage or greater than twenty-five percent localized Damage.

Table 2 (continued)

Sampled ACM Assessment Summary and Quantity

SAMPLE NUMBER	MATERIAL/ FRIABILITY/CONDITION**	POTENTIAL FOR DISTURBANCE* Contact/Erosion/Vibration	ESTIMATED QUANTITY
A-15	Mastic, yellow/black, (3% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	72 ft^2
A-16	Mastic, brown, (2% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	72 ft
A-17	Mastic, brown, (5% chrysotile), non-friable, good	High/High/High (with knowledge of future demolition activities)	72 ft

*An assessment of "High" in any of the three categories, (Contact, Erosion, or Vibration), represents the potential for Significant Damage. An assessment of "Moderate" in any of the three categories represents the potential for Damage. An assessment of "Low" in all of the three categories represents a low potential for damage.
**Damage is defined as the loss of adhesion or cohesion. Significant Damage is defined as greater than ten percent distributed Damage or greater than twenty-five percent localized Damage.

National Emission Standards for Hazardous Air Pollutants (NESHAP) states that if asbestos identified in amounts less than 10%, the owner or operator of the building must elect to assume the amount to be greater than 1% and treat the material as asbestos-containing material or request verification of the amount by point counting. All sampled materials containing <1% asbestos must be further analyzed via point count or assumed and handled as ACM.

Asbestos removal should be conducted by a DOH Certified C-19 Asbestos Abatement Contractor. Workers disturbing any quantity of ACM must have minimum United States Occupational Safety and Health Administration (OSHA) asbestos awareness training as specific to the class of disturbance work. A ten-day notification to the DOH is required for the removal of 160 square feet or 260 linear feet or more of Regulated ACM, however a courtesy notification is recommended for smaller quantities of ACM.

Lead Paint

Two paint samples were collected from the interior of Kauai Veterans Memorial Hospital, Radiology Suite. The samples were analyzed for total lead by flame atomic absorption spectrophotometry using the National Institute for Occupational Safety and Health (NIOSH) Method 7082m. The results of the samples are listed in Table 3 on the following page.

Table 3

Building Materials Sampling Locations and Analytical Results
Lead-Based Paint

SAMPLE NUMBER	LOCATION	MATERIAL	LEAD (mg/kg)
LP-1	Interior, Tech Work Station	Paint-White	<73
LP-6	Interior, Mammography	Paint-Pink	<73

*LP-2, LP-3, LP-4, and LP-5 were recollected for asbestos sampling and analysis (A-23 and A-24)

Based on the analytical results, no detectable concentration of lead was identified in the white paint collected from X-Ray 2 or in the pink paint collected from Mammography.

It has been a pleasure to be of service to you. Please contact me at 808-748-2104 if you have any questions regarding this project.

Sincerely,

Kristine Joy Sellona

Kristine Joy Sellona
Environmental Technician
HIASB Certification Number 5052

Enclosures: Laboratory Reports
Photographs
Floor Plan

Hawaii Analytical Laboratory
ANALYTICAL REPORT

Friday, July 30, 2021

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107131
Date Submitted: 7/28/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 7/26/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143814	**A-1a Orange VFT**	**Yes**	Chrysotile	**5**	Cellulose (undulose)	**2**	Tar + calcite	7/30/2021
Layer	Black mastic							
Comments								
202143814	**A-1a Orange VFT**	**Yes**	Chrysotile	**< 1**	None detected		Calcite + vinyl	7/30/2021
Layer	Orange VFT							
Comments								
202143815	**A-1b Orange VFT**							
Layer	Black mastic (not analyzed)							
Comments								
202143815	**A-1b Orange VFT**	**Yes**	Chrysotile	**< 1**	None detected		Calcite + vinyl	7/30/2021
Layer	Orange VFT							
Comments								
202143816	**A-1c Orange VFT**							
Layer	Black mastic (not analyzed)							
Comments								
202143816	**A-1c Orange VFT**	**Yes**	Chrysotile	**< 1**	None detected		Calcite + vinyl	7/30/2021
Layer	Orange VFT							
Comments								
202143817	**A-2a White/Gray Linoleum**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/gray linoleum							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143817	**A-2a White/Gray Linoleum**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143818	**A-2b White/Gray Linoleum**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/gray linoleum							
Comments								
202143818	**A-2b White/Gray Linoleum**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143819	**A-2c White/Gray Linoleum**	**Yes**	Chrysotile	**4**	Cellulose (undulose)	**2**	Tar + calcite	7/30/2021
Layer	Black mastic							
Comments								
202143819	**A-2c White/Gray Linoleum**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	Gray leveling compound							
Comments								
202143819	**A-2c White/Gray Linoleum**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/gray linoleum							
Comments								
202143819	**A-2c White/Gray Linoleum**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143820	**A-3a White/Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/blue VFT							
Comments								

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202143820	**A-3a White/Blue VFT**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143821	**A-3b White/Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/blue VFT							
Comments								
202143821	**A-3b White/Blue VFT**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143822	**A-3c White/Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White/blue VFT							
Comments								
202143822	**A-3c White/Blue VFT**		NONE DETECTED		None detected		Binder + other	7/30/2021
Layer	Yellow mastic							
Comments								
202143823	**A-4a Light Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light blue VFT							
Comments								
202143823	**A-4a Light Blue VFT**	**Yes**	Chrysotile	**3**	Cellulose (undulose)	**2**	Calcite + tar + binder	7/30/2021
Layer	Yellow/black mastics							
Comments								
202143824	**A-4b Light Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light blue VFT							
Comments								

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Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143824	**A-4b Light Blue VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143825	**A-4c Light Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light blue VFT							
Comments								
202143825	**A-4c Light Blue VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143826	**A-5a Light Brown VFT**	**Yes**	Chrysotile	**5**	Cellulose (undulose)	**2**	Tar + calcite	7/30/2021
Layer	Black mastic							
Comments								
202143826	**A-5a Light Brown VFT**	**Yes**	Chrysotile	**2**	None detected		Calcite + vinyl	7/30/2021
Layer	Light brown VFT							
Comments								
202143827	**A-5b Light Brown VFT**							
Layer	NOT ANALYZED DUE TO STOP ANALYSIS							
Comments								
202143828	**A-5c Light Brown VFT**							
Layer	NOT ANALYZED DUE TO STOP ANALYSIS							
Comments								
202143829	**A-6a Dark Brown VFT**	**Yes**	Chrysotile	**7**	Cellulose (undulose)	**2**	Tar + calcite	7/30/2021
Layer	Black mastic							
Comments								
202143829	**A-6a Dark Brown VFT**	**Yes**	Chrysotile	**2**	None detected		Calcite + vinyl	7/30/2021
Layer	Dark brown VFT							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143830	**A-6b Dark Brown VFT**							
Layer	NOT ANALYZED DUE TO STOP ANALYSIS							
Comments								
202143831	**A-6c Dark Brown VFT**							
Layer	NOT ANALYZED DUE TO STOP ANALYSIS							
Comments								
202143832	**A-7a Light Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light pink VFT							
Comments								
202143832	**A-7a Light Pink VFT**	**Yes**	Chrysotile	**3**	Cellulose (undulose)	**2**	Calcite + tar + binder	7/30/2021
Layer	Yellow/black mastics							
Comments								
202143833	**A-7b Light Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light pink VFT							
Comments								
202143833	**A-7b Light Pink VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143834	**A-7c Light Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Light pink VFT							
Comments								
202143834	**A-7c Light Pink VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143835	**A-8a Dark Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark pink VFT							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143835	**A-8a Dark Pink VFT**	**Yes**	Chrysotile	**2**	Cellulose (undulose)	**2**	Calcite + tar + binder	7/30/2021
Layer	Yellow/black mastics							
Comments								
202143836	**A-8b Dark Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark pink VFT							
Comments								
202143836	**A-8b Dark Pink VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143837	**A-8c Dark Pink VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark pink VFT							
Comments								
202143837	**A-8c Dark Pink VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143838	**A-9a Drywall**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**15**	Gypsum	7/30/2021
Layer	White drywall							
Comments								
202143838	**A-9a Drywall**		NONE DETECTED		None detected		Calcite + quartz + paint	7/30/2021
Layer	White joint compound / white paint							
Comments								
202143839	**A-9b Drywall**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**15**	Gypsum	7/30/2021
Layer	White drywall							
Comments								

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Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 7/26/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143839	**A-9b Drywall**		NONE DETECTED		None detected		Calcite + quartz + paint	7/30/2021
Layer	White joint compound / white paint							
Comments								
202143840	**A-9c Drywall**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**15**	Gypsum	7/30/2021
Layer	White drywall							
Comments								
202143840	**A-9c Drywall**		NONE DETECTED		None detected		Calcite + quartz + paint	7/30/2021
Layer	White joint compound / white paint							
Comments								
202143841	**A-10a Ceiling Tile**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**45**	Perlite + calcite + other	7/30/2021
Layer	White/gray ceiling tile							
Comments								
202143842	**A-10b Ceiling Tile**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**45**	Perlite + calcite + other	7/30/2021
Layer	White/gray ceiling tile							
Comments								
202143843	**A-10c Ceiling Tile**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**45**	Perlite + calcite + other	7/30/2021
Layer	White/gray ceiling tile							
Comments								
202143844	**A-11a Pink Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Pink covebase							
Comments								
202143844	**A-11a Pink Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								

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Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107131
Date Submitted: 7/28/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 7/26/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143845	**A-11b Pink Covebase**	**Yes**	Chrysotile	**2**	None detected		Binder + other	7/30/2021
Layer	Brown mastic (limited)							
Comments								
202143845	**A-11b Pink Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Pink covebase							
Comments								
202143845	**A-11b Pink Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143846	**A-11c Pink Covebase**							
Layer	Brown mastic (not analyzed)							
Comments								
202143846	**A-11c Pink Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Pink covebase							
Comments								
202143846	**A-11c Pink Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143847	**A-12a Blue Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Blue wallpaper							
Comments								
202143848	**A-12b Blue Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Blue wallpaper							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143849	**A-12c Blue Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Blue wallpaper							
Comments								
202143850	**A-13a Pink Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Pink wallpaper							
Comments								
202143851	**A-13b Pink Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Pink wallpaper							
Comments								
202143852	**A-13c Pink Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Pink wallpaper							
Comments								
202143853	**A-14a Blue Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Blue covebase							
Comments								
202143853	**A-14a Blue Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143854	**A-14b Blue Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Blue covebase							
Comments								
202143854	**A-14b Blue Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143855	**A-14c Blue Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Blue covebase							
Comments								
202143855	**A-14c Blue Covebase**	**Yes**	Chrysotile	**2**	None detected		Binder + other	7/30/2021
Layer	Brown mastic							
Comments								
202143855	**A-14c Blue Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143856	**A-15a Dark Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark blue VFT							
Comments								
202143856	**A-15a Dark Blue VFT**	**Yes**	Chrysotile	**3**	Cellulose (undulose)	**2**	Calcite + tar + binder	7/30/2021
Layer	Yellow/black mastics							
Comments								
202143857	**A-15b Dark Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark blue VFT							
Comments								
202143857	**A-15b Dark Blue VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								
202143858	**A-15c Dark Blue VFT**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Dark blue VFT							
Comments								
202143858	**A-15c Dark Blue VFT**							
Layer	Yellow/black mastics (not analyzed)							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143859	**A-16a White Covebase**	**Yes**	Chrysotile	**2**	None detected		Binder + other	7/30/2021
Layer	Brown mastic (limited)							
Comments								
202143859	**A-16a White Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White covebase							
Comments								
202143859	**A-16a White Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143860	**A-16b White Covebase**							
Layer	Brown mastic (not analyzed)							
Comments								
202143860	**A-16b White Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White covebase							
Comments								
202143860	**A-16b White Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143861	**A-16c White Covebase**							
Layer	Brown mastic (not analyzed)							
Comments								
202143861	**A-16c White Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	White covebase							
Comments								
202143861	**A-16c White Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143862	**A-17a Tan Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Tan covebase							
Comments								
202143862	**A-17a Tan Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143863	**A-17b Tan Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Tan covebase							
Comments								
202143863	**A-17b Tan Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143864	**A-17c Tan Covebase**	**Yes**	Chrysotile	**2**	None detected		Binder + other	7/30/2021
Layer	Brown mastic (limited)							
Comments								
202143864	**A-17c Tan Covebase**		NONE DETECTED		None detected		Calcite + vinyl	7/30/2021
Layer	Tan covebase							
Comments								
202143864	**A-17c Tan Covebase**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	Yellow mastic							
Comments								
202143865	**A-18a HVAC Duct Insulation**		NONE DETECTED		Fibrous glass (amorphous)	> **99**	None detected	7/30/2021
Layer	Pink insulation							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143865	**A-18a HVAC Duct Insulation**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**50**	Foil	7/30/2021
Layer	Silver/tan wrap							
Comments								
202143866	**A-18b HVAC Duct Insulation**		NONE DETECTED		Fibrous glass (amorphous)	**> 99**	None detected	7/30/2021
Layer	Pink insulation							
Comments								
202143866	**A-18b HVAC Duct Insulation**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**50**	Foil	7/30/2021
Layer	Silver/tan wrap							
Comments								
202143867	**A-18c HVAC Duct Insulation**		NONE DETECTED		Fibrous glass (amorphous)	**> 99**	None detected	7/30/2021
Layer	Pink insulation							
Comments								
202143867	**A-18c HVAC Duct Insulation**		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	**50**	Foil	7/30/2021
Layer	Silver/tan wrap							
Comments								
202143868	**A-19a Blue CFT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	Gray grout							
Comments								
202143869	**A-19b Blue CFT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	Gray grout							
Comments								
202143870	**A-19c Blue CFT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	Gray grout							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143871	**A-20a Blue CWT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	White grout							
Comments								
202143872	**A-20b Blue CWT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	White grout							
Comments								
202143873	**A-20c Blue CWT w/Grout**		NONE DETECTED		None detected		Calcite + quartz	7/30/2021
Layer	White grout							
Comments								
202143874	**A-21a White Caulking**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	White caulk							
Comments								
202143875	**A-21b White Caulking**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	White caulk							
Comments								
202143876	**A-21c White Caulking**		NONE DETECTED		None detected		Calcite + binder	7/30/2021
Layer	White caulk							
Comments								
202143877	**A-22a Brown Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Brown wallpaper							
Comments								
202143878	**A-22b Brown Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Brown wallpaper							
Comments								

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Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202143879	**A-22c Brown Wallpaper**		NONE DETECTED		Cellulose (undulose)	**50**	Other	7/30/2021
Layer	Brown wallpaper							
Comments								

General Comments
The bulk sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures outlined in the United States Environmental Protection Agency's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA-600/M4-82-020, Dec. 1982) and / or "Method for Determination of Asbestos in bulk Building Materials" (EPA-600/R-93-116, July 1993). The analysis of each bulk sample relates only to the material examined, and may or may not represent the overall composition of its original source. Floor tile and other resinously bound materials, when analyzed by the EPA methods referenced above may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. Alternative methods of identification, including Transmission Electron Microscopy (TEM) may or may not be applicable. We utilize calibrated visual area estimation on a routine basis and do not conduct point counting unless specifically requested to do so. Estimated error for the visual determinations presented are 75% relative (1 to 2%), 50% relative (3 to 5%); 25% relative (6 to 25%) and 20% (>26% v/v). We will not separate layers which in our opinion are not readily discernable. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Governement. Unless otherwise indicated, the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
None Detected = asbestos was not observed in the sample. If trace amount of asbestos was detected below our quantifiable limits of 1.0%, <1% (trace) would be indicated and the asbestos type listed. Point counting, where applicable, are recommended to improve accuracy.

Jennifer Hsu Liao
Laboratory Manager

HAWAII ANALYTICAL LABORATORY, LLC
3615 Harding Avenue, Suite 308
Honolulu, HI 96816
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FAX: 808-735-0047

☐ New Client?

Report To*	
Company	ENPRO Environmental
Address*	151 Hekili Street, Suite 210 Kailua, HI 96734
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via email or fax	info@enproenvironmental.com
or verbal:	

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Need Results By*:
- ☐ 5 Working Days
- ☐ 4 Working Days
- ☒ 72 hour
- ☐ 48 hour
- ☐ 24 Hour
- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-1a : Orange VFT	07-26-2021	Bulk	N/A	Asbestos		202143814
A-1b						202143815
A-1c						202143816
A-2a : White/gray linoleum						202143817
A-2b						202143818
A-2c						202143819
A-3a : White/blue VFT						202143820
A-3b						202143821
A-3c						202143822
A-4a : Light blue VFT						202143823
A-4b						202143824
A-4c						202143825

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	~~07-28-108 35:06RC~~ 7/28/21 8:25

Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.
*Required fields, failure to complete these fields may result in a delay in your samples being processed.
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Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-5a : Light brown VFT	07-26-2021	Bulk	N/A	Asbestos		202143826
A-5b						202143827
A-5c						202143828
A-6a : Dark brown VFT						202143829
A-6b						202143830
A-6c						202143831
A-7a : Light Pink VFT						202143832
A-7b						202143833
A-7c						202143834
A-8a : Dark Pink VFT						202143835
A-8b						202143836
A-8c						202143837

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25

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Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107 - 00256 - HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY

Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	*Lab ID*
A-9a : Drywall	07-26-2021	Bulk	N/A	Asbestos		202143838
A-9b	↓	↓	↓	↓		202143839
A-9c	↓	↓	↓	↓		202143840
A-10a : Ceiling Tile	↓	↓	↓	↓		202143841
A-10b	↓	↓	↓	↓		202143842
A-10c	↓	↓	↓	↓		202143843
A-11a : Pink cavebase	↓	↓	↓	↓		202143844
A-11b	↓	↓	↓	↓		202143845
A-11c	↓	↓	↓	↓		202143846
A-12a : Blue wallpaper	↓	↓	↓	↓		202143847
A-12b	↓	↓	↓	↓		202143848
A-12c	↓	↓	↓	↓		202143849

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25a

Sample description can be paint chips, concrete, specific sample collection location, etc...
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- ☐ 4 Working Days
- ☒ 72 hour
- ☐ 48 hour
- ☐ 24 Hour
- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-13a: Pink Wallpaper	07-26-2021	Bulk	N/A	Asbestos		202143850
A-13b	"	"	"	"		202143851
A-13c	"	"	"	"		202143852
A-14a: Blue Covebase	"	"	"	"		202143853
A-14b	"	"	"	"		202143854
A-14c	"	"	"	"		202143855
A-15a: Dark blue VFT	"	"	"	"		202143856
A-15b	"	"	"	"		202143857
A-15c	"	"	"	"		202143858
A-16a: White Covebase	"	"	"	"		202143859
A-16b	"	"	"	"		202143860
A-16c	"	"	"	"		202143861

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25a

Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.
***Required fields, failure to complete these fields may result in a delay in your samples being processed.**
Rev 20140701

HAWAII ANALYTICAL LABORATORY, LLC

3615 Harding Avenue, Suite 308
Honolulu, HI 96816
PH: 808-735-0422
FAX: 808-735-0047

☐ New Client?

Report To*	
Company	ENPRO Environmental
Address*	151 Hekili Street, Suite 210 Kailua, HI 96734
Phone / Cell No.*	808-262-0909
Report results to	ksellona@enproenvironmental.com
via email or fax	info@enproenvironmental.com
or verbal:	

Invoice To*	Kanani Cale
Company	ENPRO Environmental
Address*	151 Hekili Street, Suite 210 Kailua, HI 96734
Phone / Cell No.*	808-262-0909
Purchase Order No.	
Email Invoice To	info@enproenvironmental.com

Need Results By*:
- ☐ 5 Working Days
- ☐ 4 Working Days
- ☒ 72 hour
- ☐ 48 hour
- ☐ 24 Hour
- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☐ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-17a: Tan Covebase	07-26-2021	Bulk	N/A	Asbestos		202143862
A-17b	"	"	"	"		202143863
A-17c	"	"	"	"		202143864
A-18a: HVAC Duct Insulation	"	"	"	"		202143865
A-18b	"	"	"	"		202143866
A-18c	"	"	"	"		202143867
A-19a: Blue CFT w/ Grout	"	"	"	"		202143868
A-19b	"	"	"	"		202143869
A-19c	"	"	"	"		202143870
A-20a: Blue CWT w/ Grout	"	"	"	"		202143871
A-20b	"	"	"	"		202143872
A-20c	"	"	"	"		202143873

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25a

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Rev 20140701

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Phone / Cell No.*	808-262-0909
Purchase Order No.	
Email Invoice To	info@enproenvironmental.com

Need Results By*:

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- ☐ 4 Working Days
- ☒ 72 hour
- ☐ 48 hour
- ☐ 24 Hour
- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-0025 6-HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107131

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-21a: White Caulking	07-26-2021	Bulk	N/A	Asbestos		202143874
A-21b						202143875
A-21c						202143876
A-22a: Brown Wallpaper						202143877
A-22b						202143878
A-22c						202143879
- Last Entry						
						KS 7-26-21

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kistine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25a

Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
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Rev 20140701

Hawaii Analytical Laboratory
ANALYTICAL REPORT

Friday, August 6, 2021

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107364
Date Submitted: 8/4/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 8/3/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202145306	**A-23a Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145306	**A-23a Blue/Yellow Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Green adhesive (limited)							
Comments								
202145306	**A-23a Blue/Yellow Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive (limited)							
Comments								
202145306	**A-23a Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Yellow wood laminate							
Comments								
202145307	**A-23b Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145307	**A-23b Blue/Yellow Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Green adhesive							
Comments								

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107364
Date Submitted: 8/4/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 8/3/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202145307	**A-23b Blue/Yellow Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive							
Comments								
202145307	**A-23b Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Yellow wood laminate							
Comments								
202145308	**A-23c Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145308	**A-23c Blue/Yellow Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive							
Comments								
202145308	**A-23c Blue/Yellow Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Yellow wood laminate							
Comments								
202145309	**A-24a Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145309	**A-24a Blue/Red Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive (1)							
Comments								
202145309	**A-24a Blue/Red Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive (2) (limited)							
Comments								

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107364
Date Submitted: 8/4/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 8/3/21

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v	Matrix	Date Analyzed
202145309	**A-24a Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Red wood laminate							
Comments								
202145310	**A-24b Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145310	**A-24b Blue/Red Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive							
Comments								
202145310	**A-24b Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Red wood laminate							
Comments								
202145311	**A-24c Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Blue wood laminate							
Comments								
202145311	**A-24c Blue/Red Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Green adhesive							
Comments								
202145311	**A-24c Blue/Red Wood Laminate**		NONE DETECTED		None detected		Binder + other	8/5/2021
Layer	Red adhesive (limited)							
Comments								
202145311	**A-24c Blue/Red Wood Laminate**		NONE DETECTED		Wood fibers (undulose)	**70**	Other	8/5/2021
Layer	Red wood laminate							
Comments								

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107364
Date Submitted: 8/4/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 8/3/21

General Comments
The bulk sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures outlined in the United States Environmental Protection Agency's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA-600/M4-82-020, Dec. 1982) and / or "Method for Determination of Asbestos in bulk Building Materials" (EPA-600/R-93-116, July 1993). The analysis of each bulk sample relates only to the material examined, and may or may not represent the overall composition of its original source. Floor tile and other resinously bound materials, when analyzed by the EPA methods referenced above may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. Alternative methods of identification, including Transmission Electron Microscopy (TEM) may or may not be applicable. We utilize calibrated visual area estimation on a routine basis and do not conduct point counting unless specifically requested to do so. Estimated error for the visual determinations presented are 75% relative (1 to 2%), 50% relative (3 to 5%); 25% relative (6 to 25%) and 20% (>26% v/v). We will not separate layers which in our opinion are not readily discernable. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Governement. Unless otherwise indicated, the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
None Detected = asbestos was not observed in the sample. If trace amount of asbestos was detected below our quantifiable limits of 1.0%, <1% (trace) would be indicated and the asbestos type listed. Point counting, where applicable, are recommended to improve accuracy.

Anne Antin
Quality Control Manager

HAWAII ANALYTICAL LABORATORY, LLC
3615 Harding Avenue, Suite 308
Honolulu, HI 96816
PH: 808-735-0422
FAX: 808-735-0047

☐ New Client?

Report To*	
Company	ENPRO Environmental
Address*	151 Hekili Street, Suite 210 Kailua, HI 96734
Phone / Cell No.*	808-262-0909
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Company	ENPRO Environmental
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Phone / Cell No.*	808-262-0909
Purchase Order No.	
Email Invoice To	info@enproenvironmental.com

Need Results By*:
- ☐ 5 Working Days
- ☐ 4 Working Days
- ☒ 72 hour
- ☐ 48 hour
- ☐ 24 Hour
- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona 5052

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107364

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	Lab ID
A-23a: Blue/Yellow Wood Laminate	08-03-2021	Bulk	N/A	Asbestos		202145306
A-23b	"	"	"	"		202145307
A-23c	"	"	"	"		202145308
A-24a: Blue/Red Wood Laminate	"	"	"	"		202145309
A-24b	"	"	"	"		202145310
A-24c	"	"	"	"		202145311
- Last Entry						

KS 8-3-21

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	8-4-21	Anne Antin Anne Antin	08-04-21 A08:16 IN

Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.
*Required fields, failure to complete these fields may result in a delay in your samples being processed.
Rev 20140701

Hawaii Analytical Laboratory
ANALYTICAL REPORT

2 August, 2021 issued amended report to replace original report dated 30 July, 2021.

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107129
Date Submitted: 7/28/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 7/26/21

Total Lead (paint chips)

NIOSH Method: 7082m LEAD by FAAS

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202143784	**LP-1 White Paint**	< 73	mg/kg	7/29/2021
Comments				
202143789	**LP-6 Pink Paint**	< 73	mg/kg	7/29/2021
Comments				

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on www.aihaaccreditedlabs.org, in accordance with the recognized ISO/ IEC 17025:2005 and participates in the CAPT proficiency testing program. AIHA is a NLLAP recognized accrediting body.
Controlled doc.: Lead Report, rev. 3 - 20181015

ENPRO Environmental
151 Hekili Street,Suite. 210
Kailua HI 96734

Phone Number: (808)262-0909
Facsimile: (808) 262-4449
Email: -

Lab Job No: 202107129
Date Submitted: 7/28/2021
Your Project: 2107-00256-HAZ, Kauai Veterans Memorial Hospital, 7/26/21

All Quality Control data are acceptable unless otherwise noted.
MRL for lead air is 5ug.
MRL for lead wipe is 10ug.
MRL for lead paint or soil is 40 mg/kg for a 0.25g sample.

General Comments
The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document profiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions
> This testing result is greater than the numerical value listed.
< This testing result is less than the numerical value listed.
# = Analytical methods marked with an "#" are not within our AIHA LAP, LLC Scope of Accreditation.
MRL = Method Reporting Limit.

Anne Antin

Anne Antin
Quality Control Manager

HAWAII ANALYTICAL LABORATORY, LLC

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- ☐ Rush - 6 hours
- ☐ Immediate - 4 hrs or less

Site/Project Name: Kauai Veterans Memorial Hospital

Client Project No.: 2107-00256-HAZ

Sampled By: Kristine Sellona

Comments / Special Instructions:

PLM POSITIVE STOP Instructions:
- ☐ Positive stop per SAMPLE
- ☒ Positive stop per LAYER

LAB USE ONLY
Lab Report No.: 202107129

Sample Identification* (Maxmium of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	*Lab ID*
LP-1: White Paint	07-26-2021	Paint	N/A	Lead		202143784
LP-2: Yellow Paint						202143785
LP-3: Blue Paint						202143786
LP-4: Red Paint						202143787
LP-5: Light Blue Paint						202143788
LP-6: Pink Paint						202143789
- Last Entry						

KS 7-26-21

Relinquished By (Print and Sign)	Date/Time	Received By (Print and Sign)	Date/Time
Kristine Sellona Kristine Sellona	7-28-21	Rozlyn Luber Rozlyn Luber	7/28/21 8:25a

Sample description can be paint chips, concrete, specific sample collection location, etc...
If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
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Rev 20140701

Photo 1

4643 Waimea Canyon Drive – Facing East

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 2

Asbestos Bulk Sample 1a: Orange Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

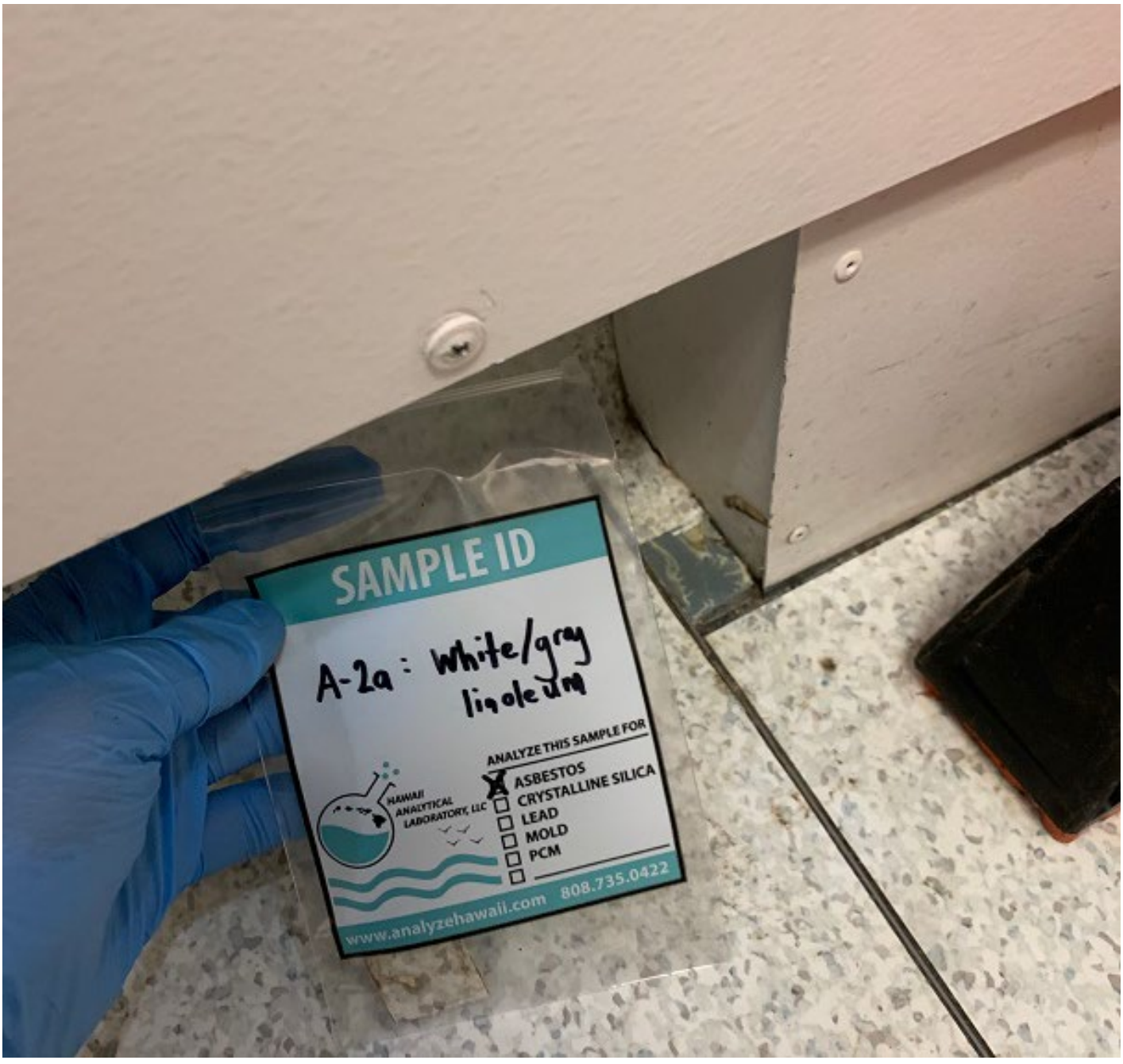

Photo 3

Asbestos Bulk Sample 2a: White/Gray Linoleum Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

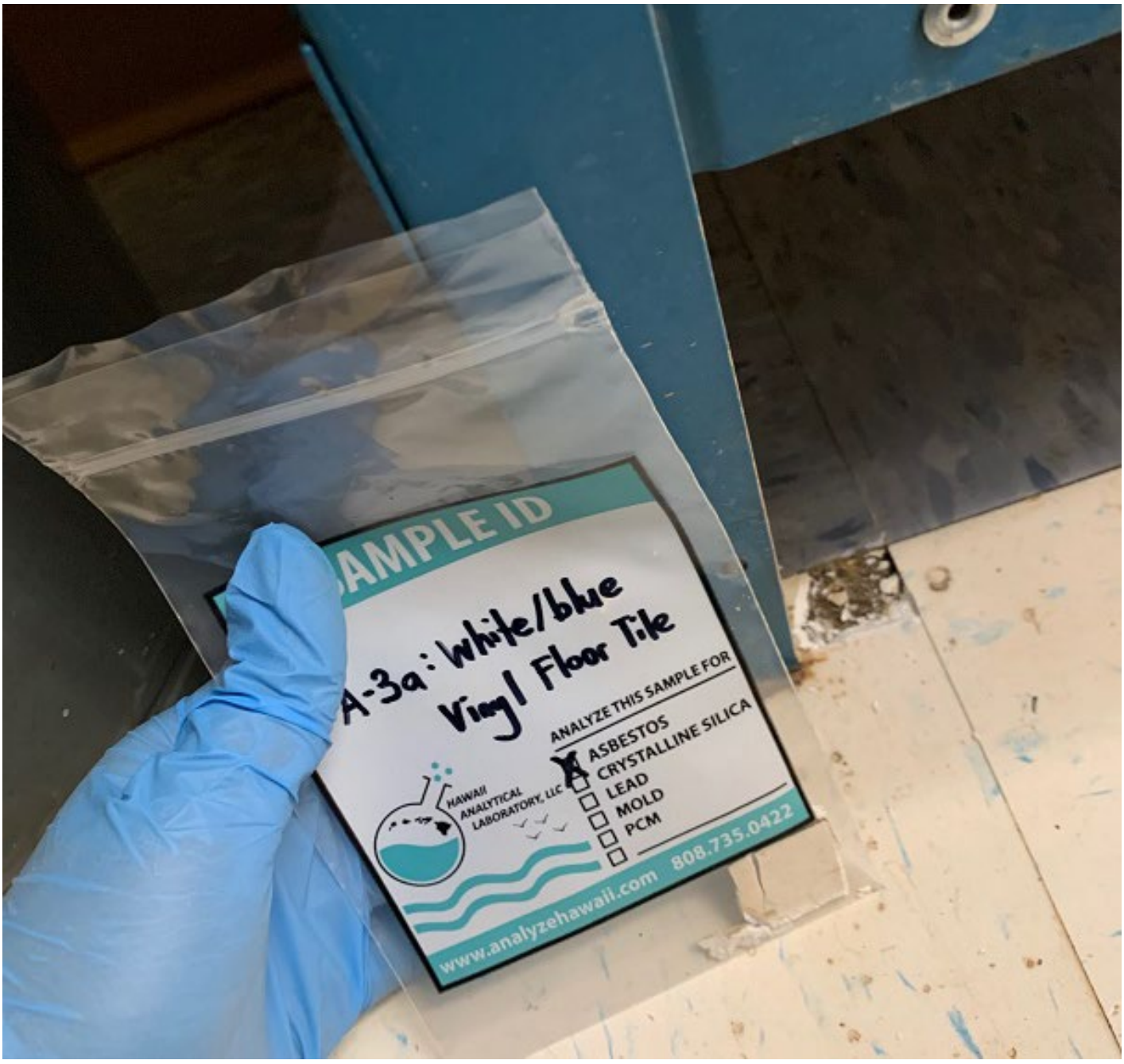

Photo 4

Asbestos Bulk Sample 3a: White/Blue Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

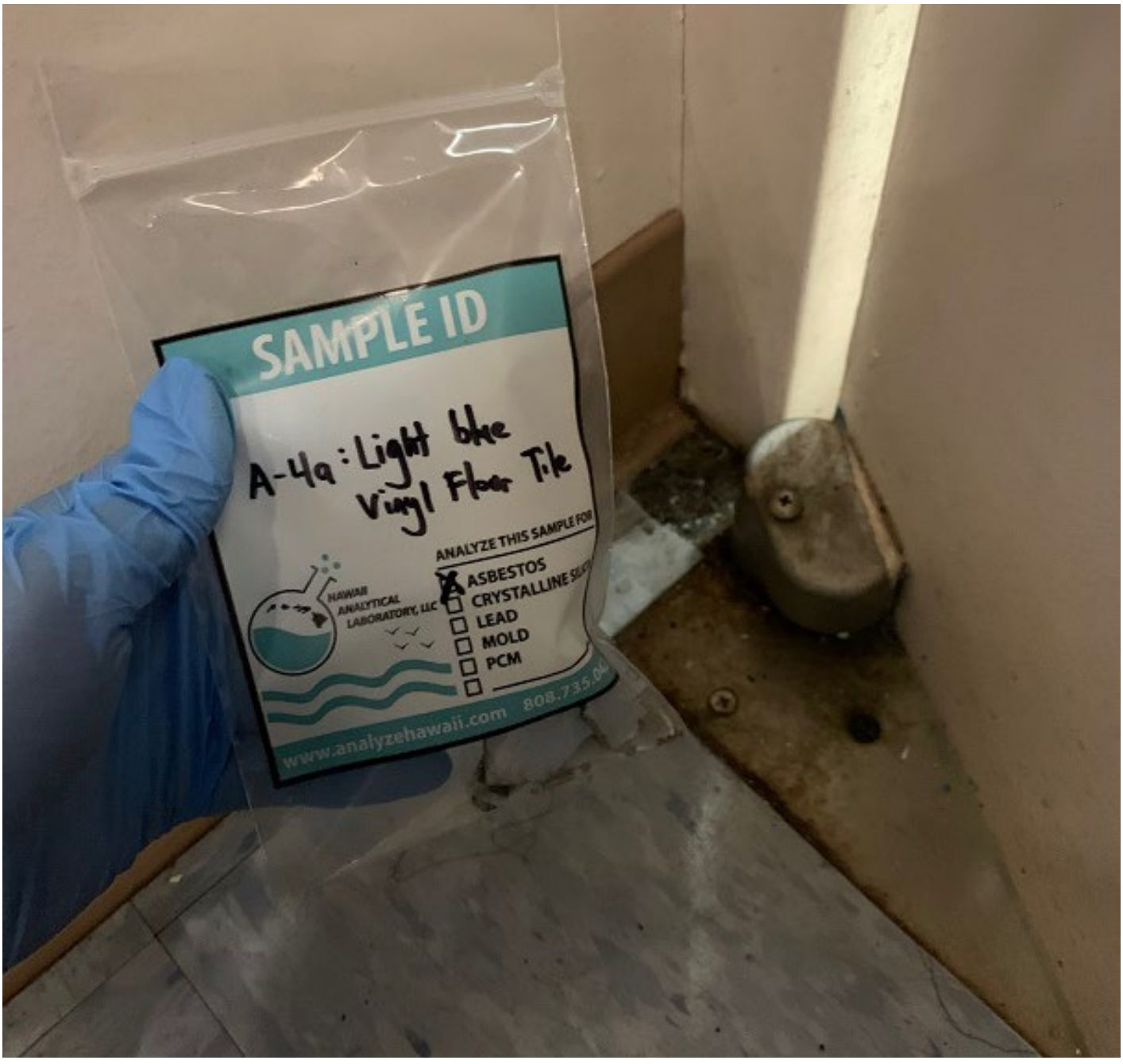

Photo 5

Asbestos Bulk Sample 4a: Light Blue Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 6

Asbestos Bulk Sample 5a: Light Brown Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

environmental ENPRO

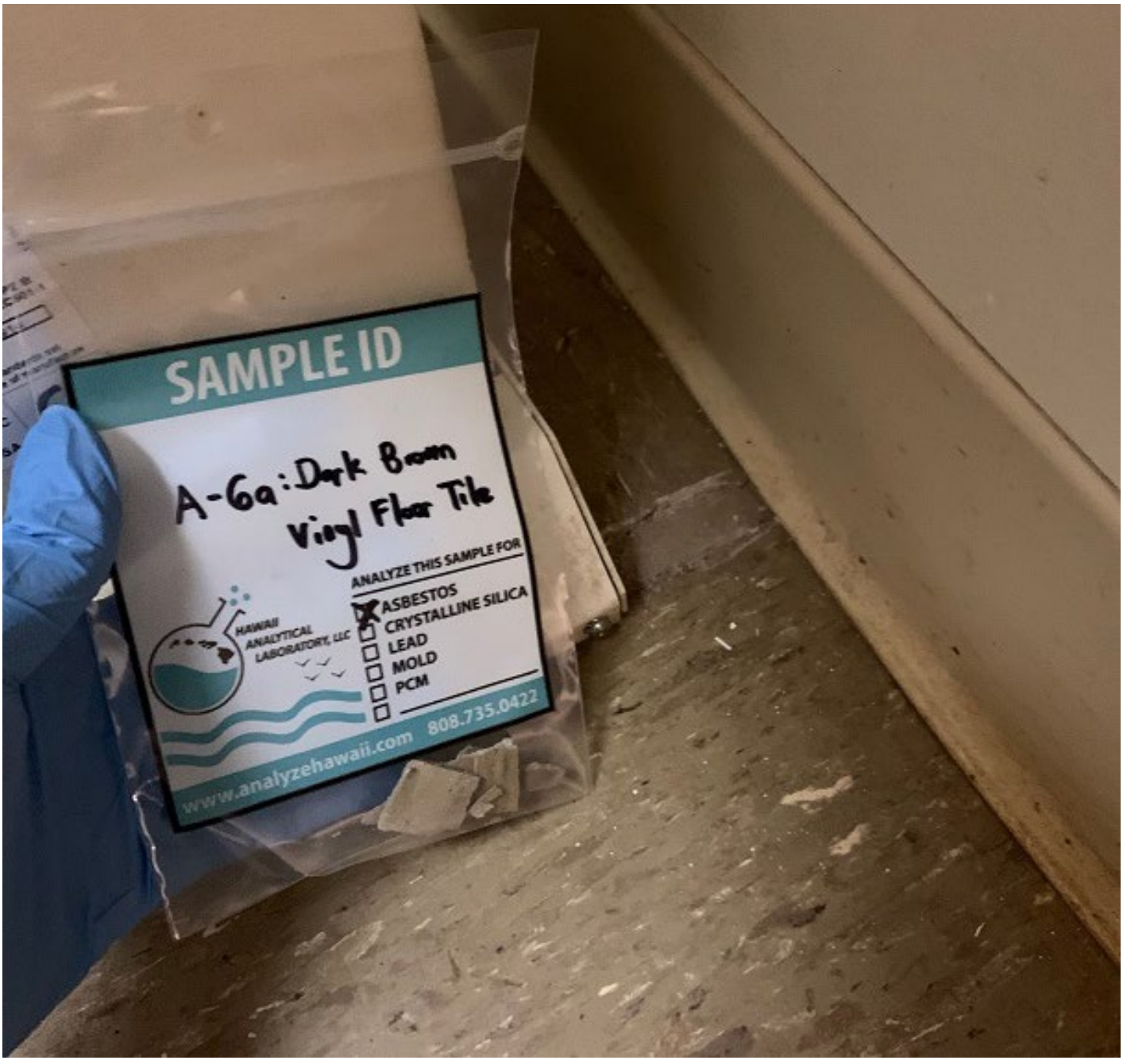

Photo 7

Asbestos Bulk Sample 6a: Dark Brown Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

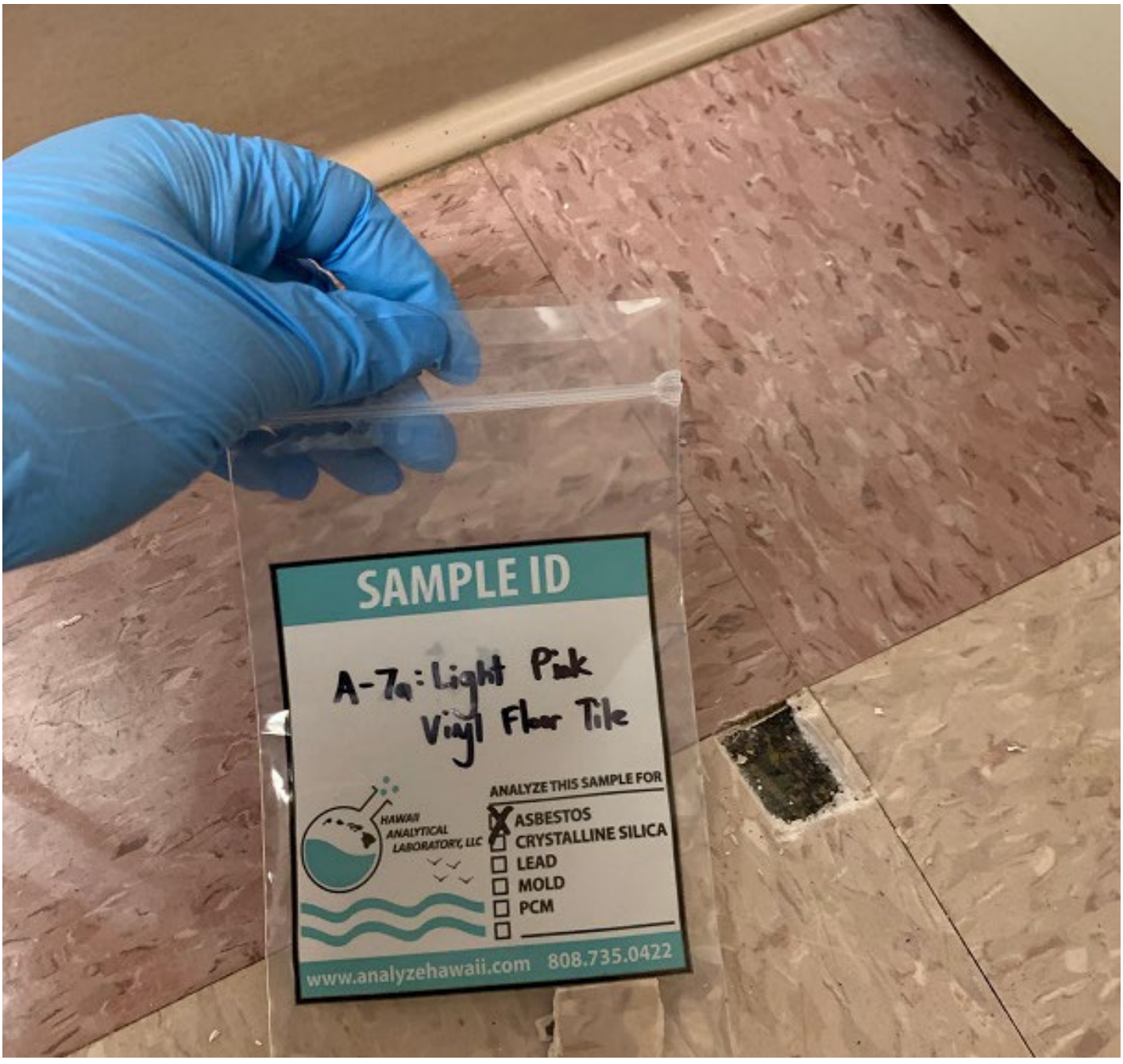

Photo 8

Asbestos Bulk Sample 7a: Light Pink Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 9

Asbestos Bulk Sample 8a: Dark Pink Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 10

Asbestos Bulk Sample 9a: Drywall Wall Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 11

Asbestos Bulk Sample 10a: Ceiling Tile

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 12

Asbestos Bulk Sample 11a: Pink Covebase and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

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Photo 13

Asbestos Bulk Sample 12a: Blue Wallpaper and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 14

Asbestos Bulk Sample 13a: Pink Wallpaper and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 15

Asbestos Bulk Sample 14a: Blue Covebase and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

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Photo 16

Asbestos Bulk Sample 15a: Dark Blue Vinyl Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 17

Asbestos Bulk Sample 16a: White Covebase and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

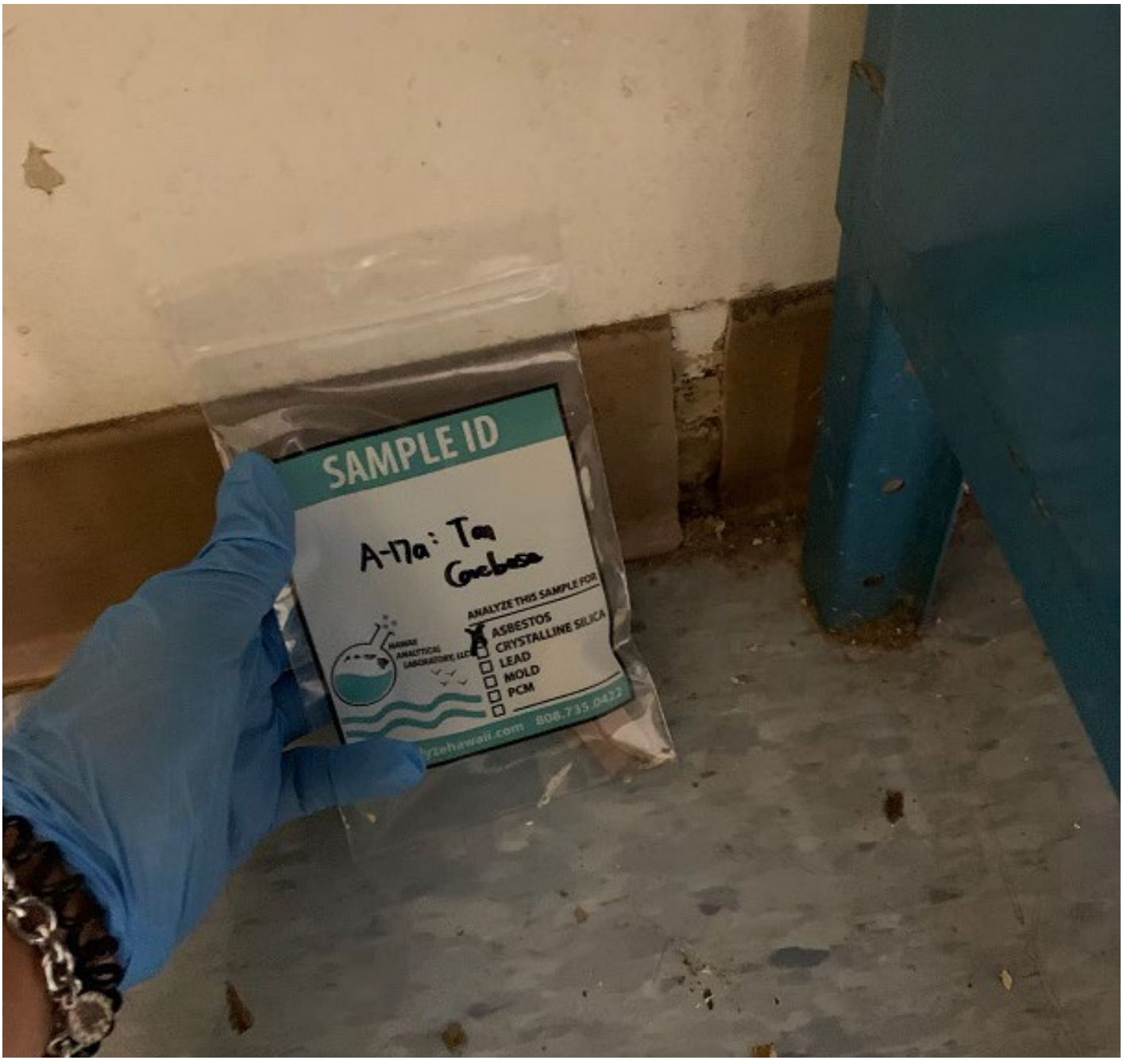

Photo 18

Asbestos Bulk Sample 17a: Tan Covebase and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

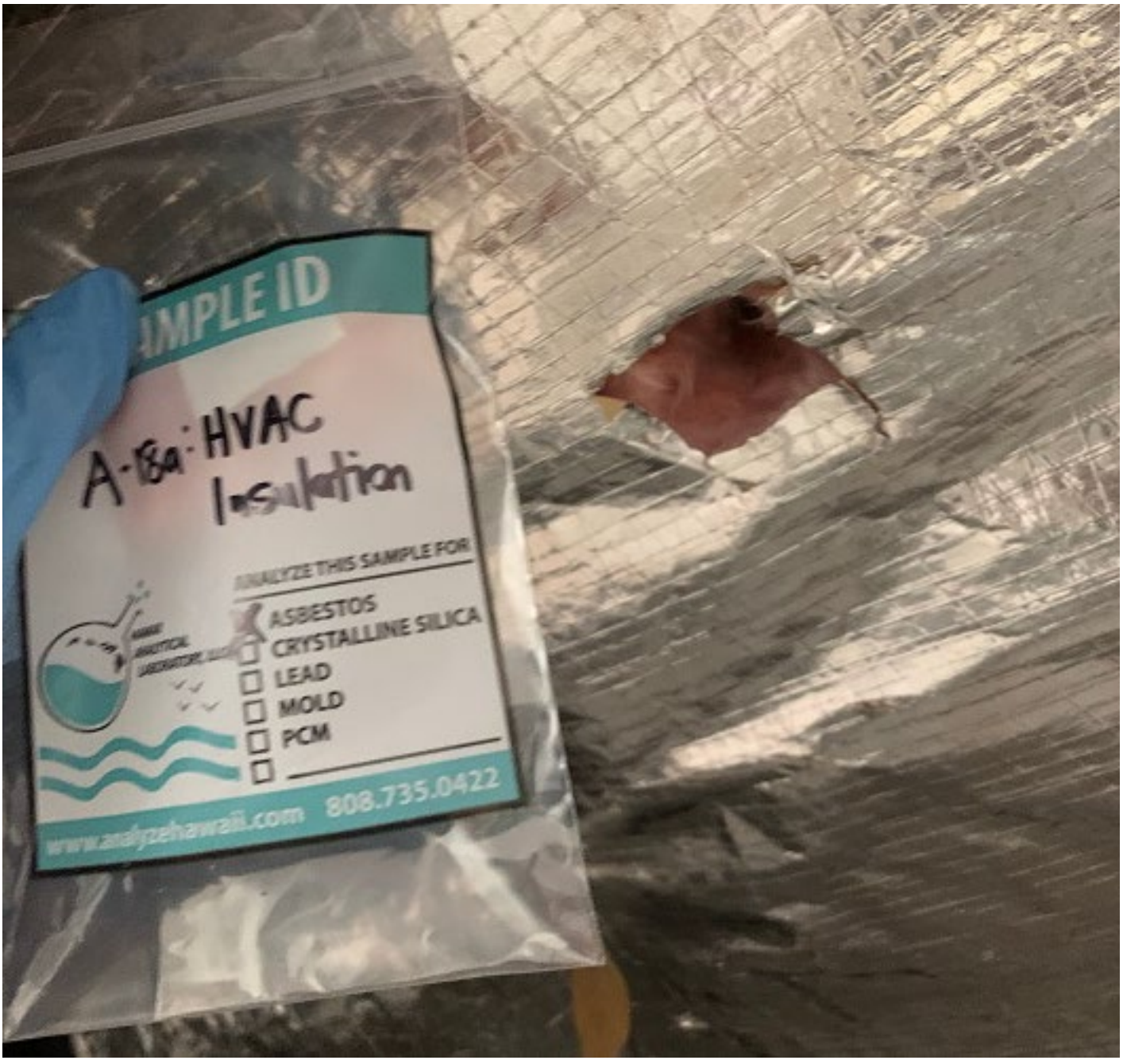

Photo 19

Asbestos Bulk Sample 18a: HVAC Duct Thermal Insulation

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

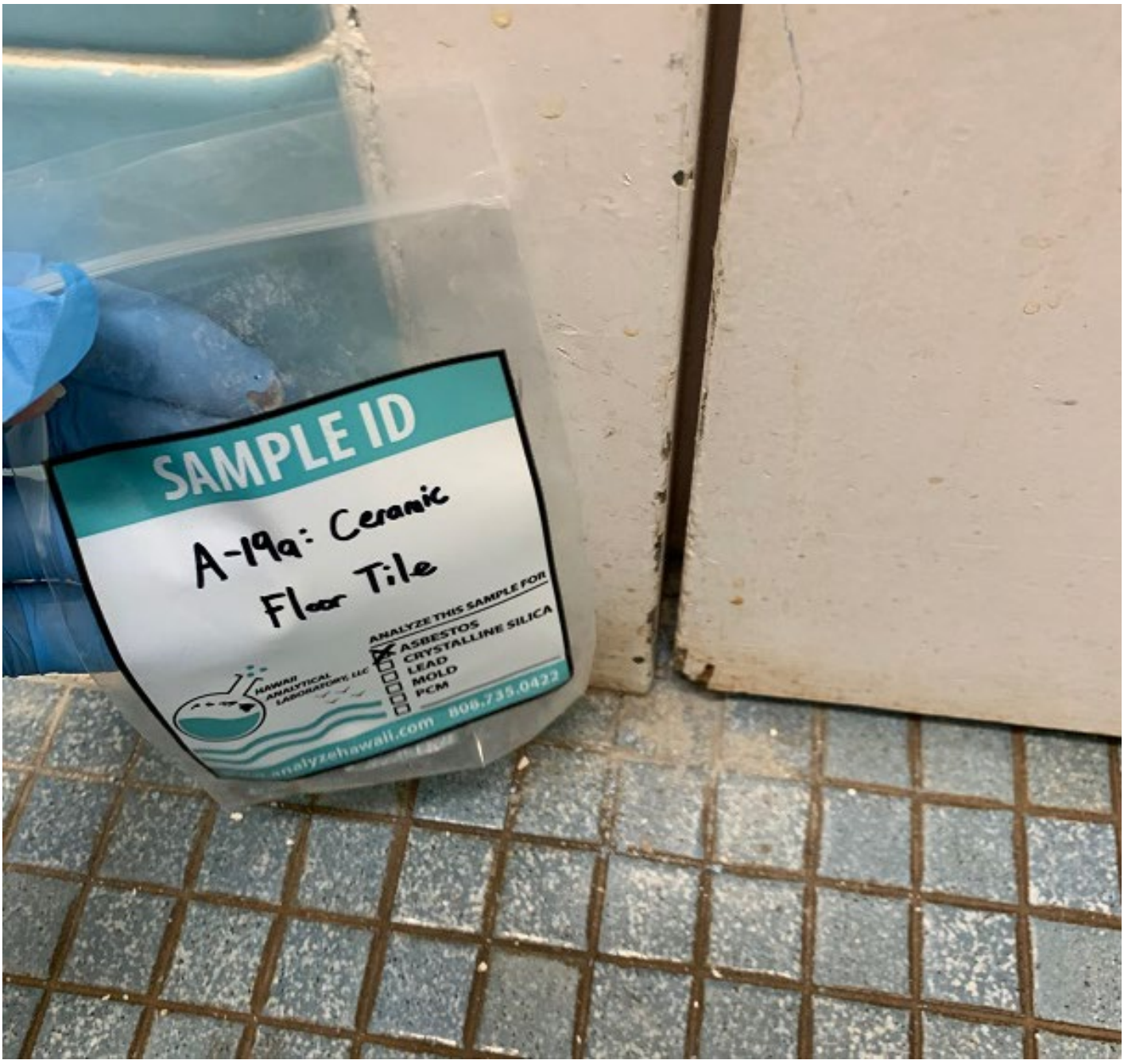

Photo 20

Asbestos Bulk Sample 19a: Ceramic Floor Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

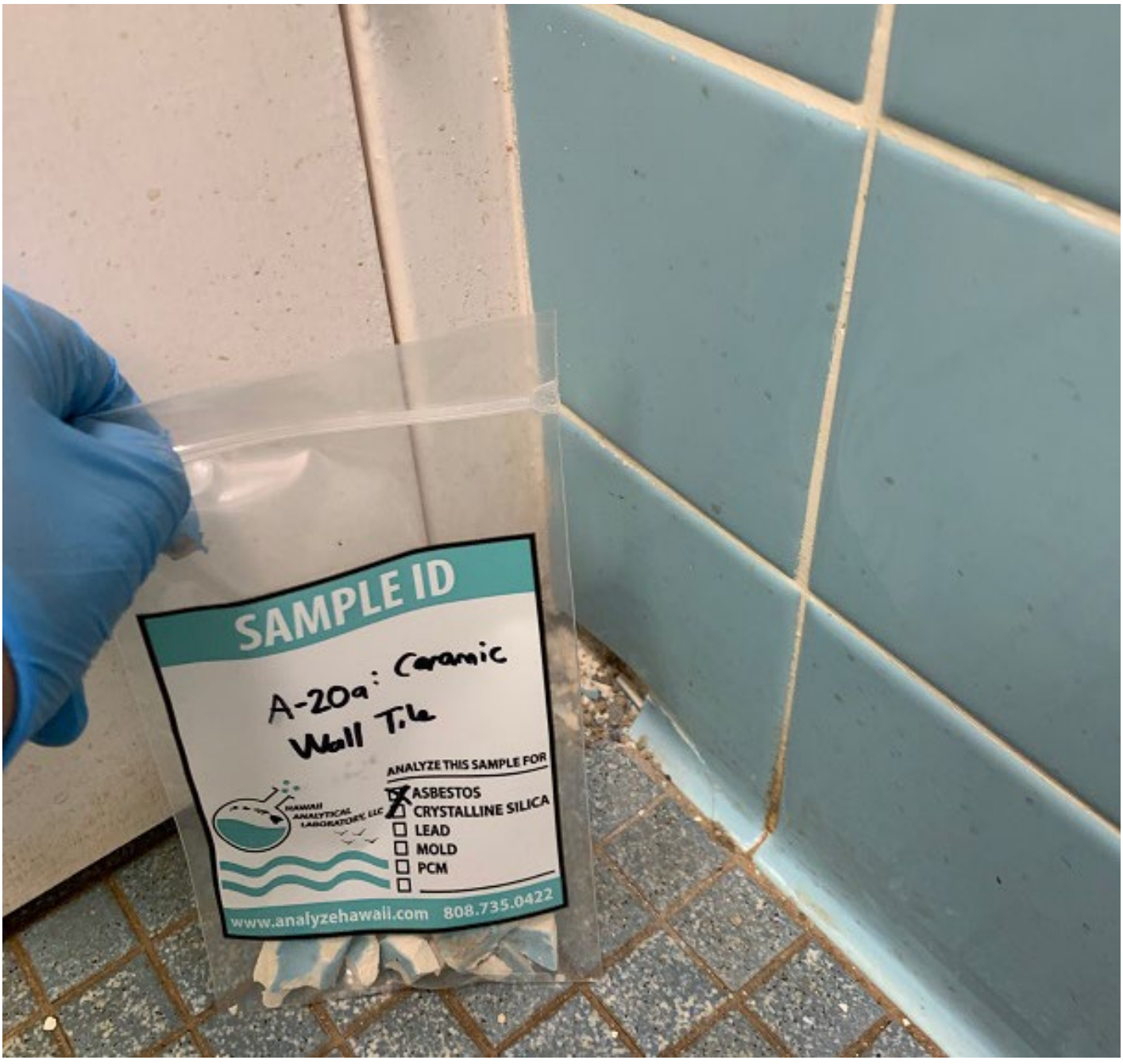

Photo 21

Asbestos Bulk Sample 20a: Ceramic Wall Tile Assembly

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

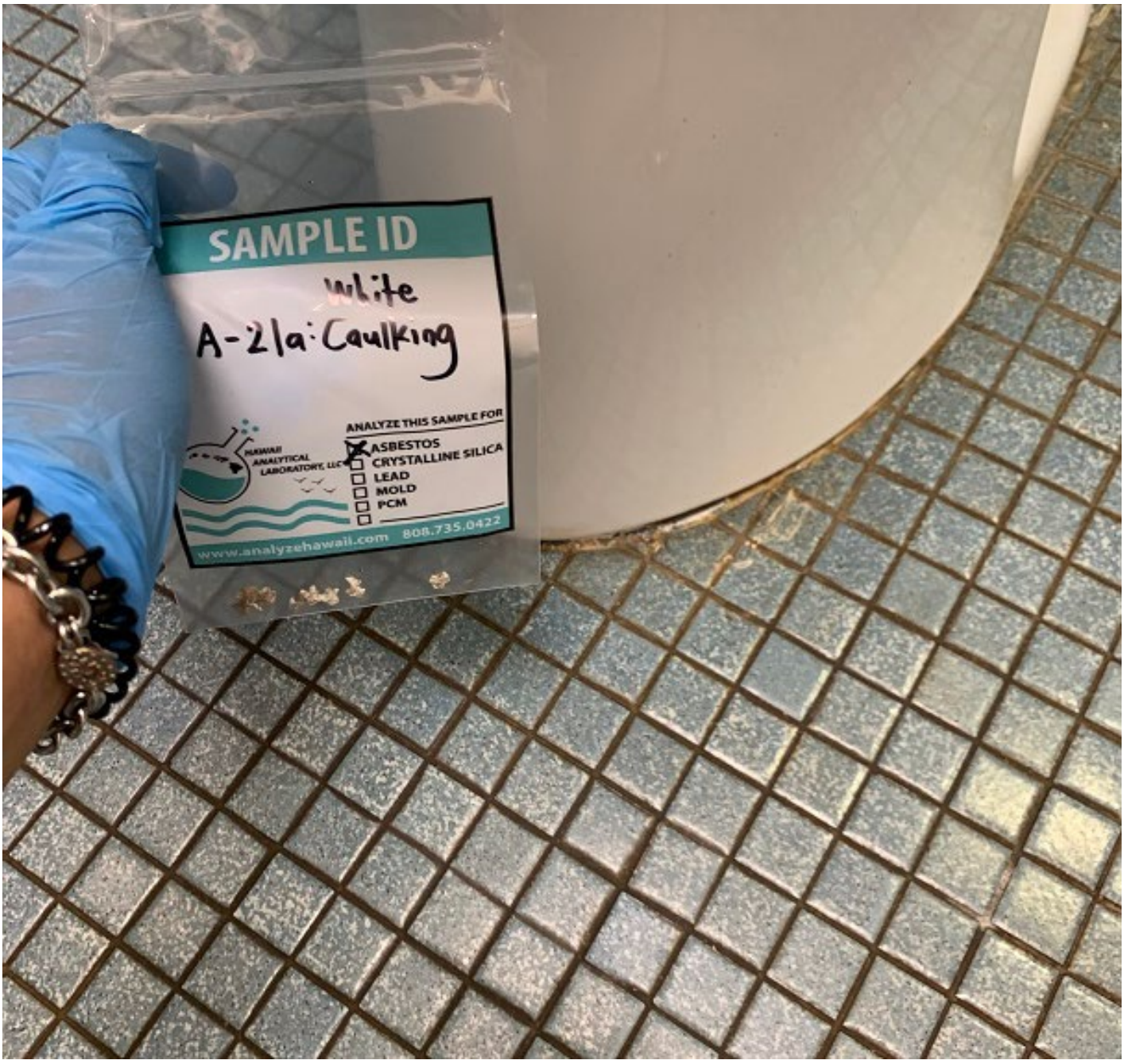

Photo 22

Asbestos Bulk Sample 21a: White Caulking

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 23

Asbestos Bulk Sample 22a: Brown Wallpaper and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

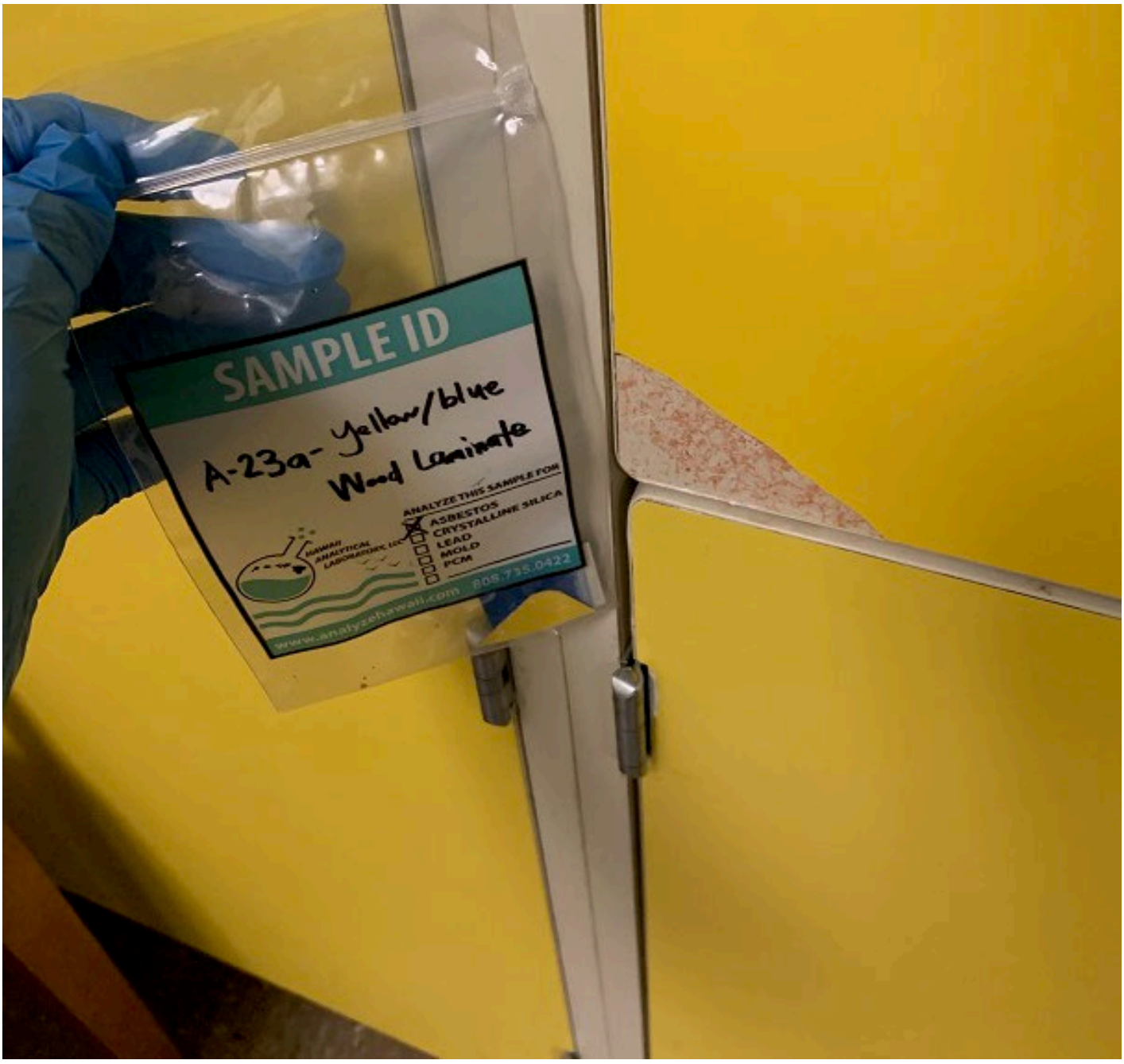

Photo 24

Asbestos Bulk Sample 23a: Yellow/Blue Wood Laminate and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: August 3, 2021

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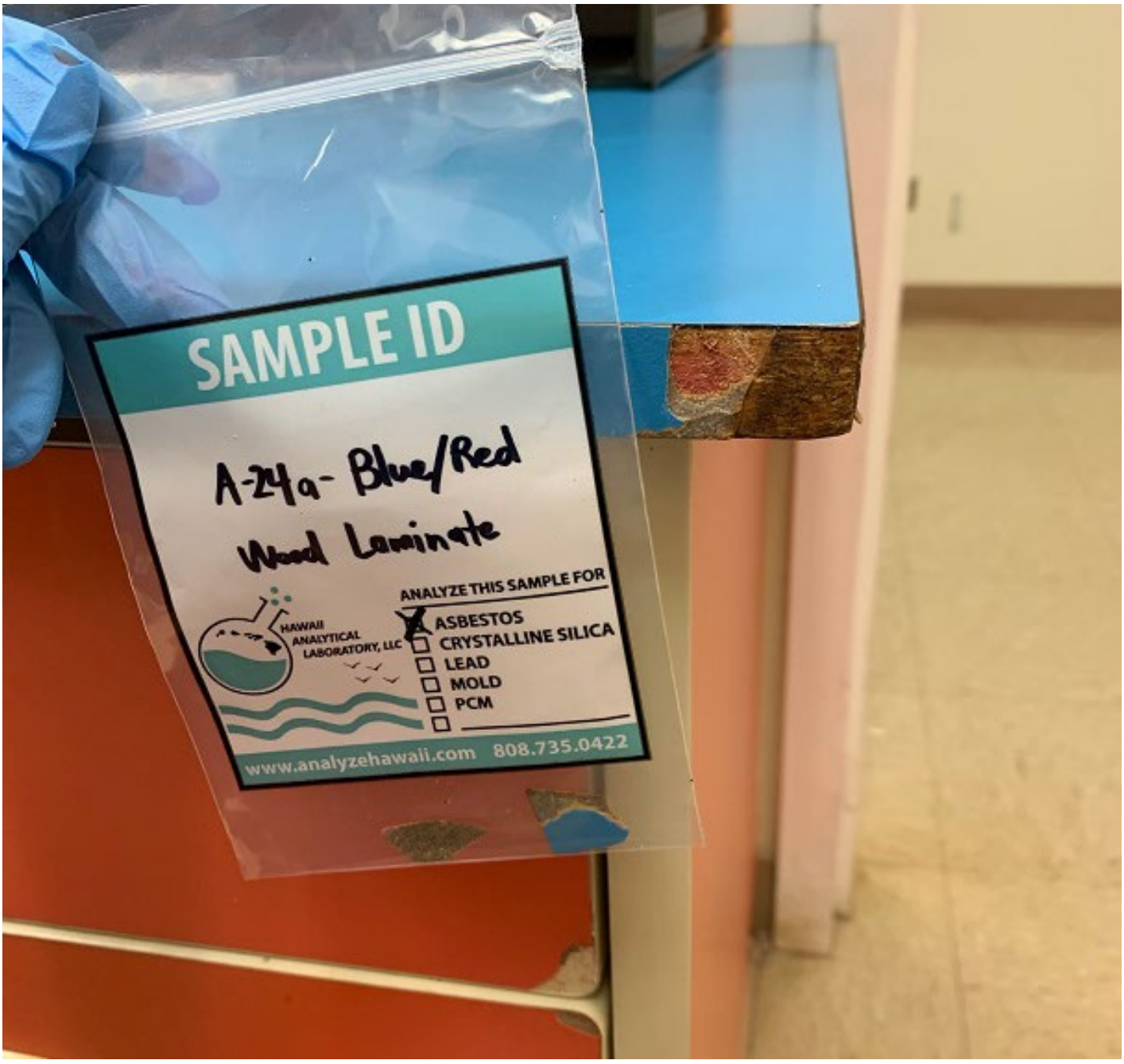

Photo 25

Asbestos Bulk Sample 24a: Blue/Red Wood Laminate and Associated Mastics

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: August 3, 2021

Photo 26

Lead Paint Chip Sample LP1: White Paint

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

Photo 27

Lead Paint Chip Sample LP6: Pink Paint

Project Number: 2107-00256-HAZ

Kauai Veterans Memorial Hospital, Radiology Suite

4643 Waimea Canyon Drive

Date of Photos: July 26, 2021

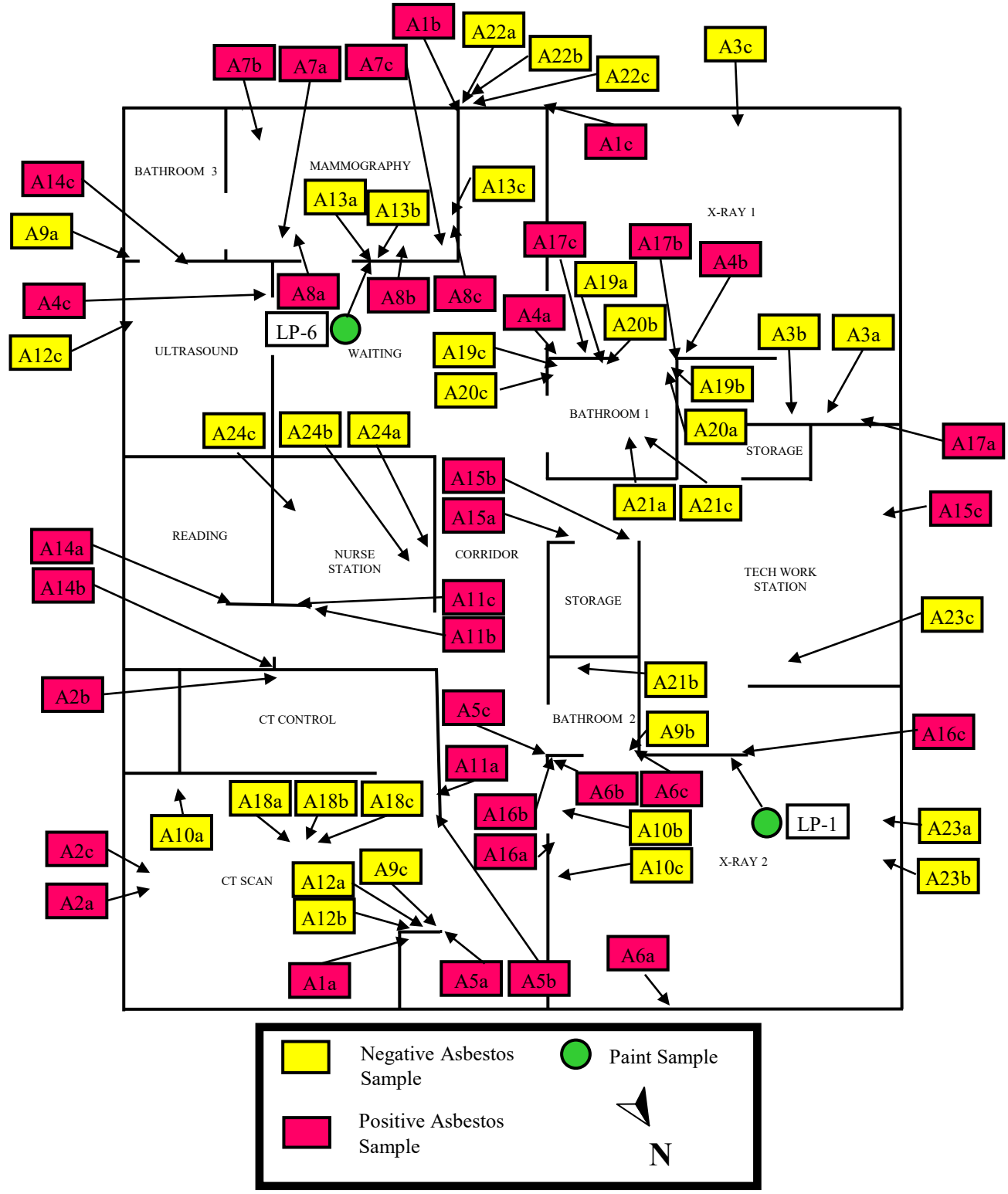

Figure 1

Asbestos and Lead Sampling Locations

Project Number: 2107-00256-HAZ

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4643 Waimea Canyon Drive