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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA/KSC-02 82 13.00 98 (July 2020)

Preparing Activity: NASA

Superseding
NASA/KSC-02 82 13.00 98 (February 2012)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023

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SECTION 02 82 13.00 98

ASBESTOS ABATEMENT
07/20

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NOTE: This specification covers the requirements for asbestos demolition, construction and abatement requirements at Kennedy Space Center (including NASA/KSC facilities at Cape Canaveral Air Station). This section is to be edited only by personnel certified by the State of Florida as a Florida Licensed Abatement Consultant (FLAC). This is a local master specification for NASA at Kennedy Space Center.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Recommended changes to a NASAKSC Master Specification Section should be submitted as a Criteria Change Request (CCR) to the appropriate Technical Proponent (TP) through the SpecsIntact Help Desk.

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PART 1 GENERAL

1.1 SUMMARY

This section specifies the asbestos abatement requirements and the applicable asbestos procedures. These include:

a. Demolition or salvage of structures where asbestos is present

b. Removal or encapsulation of materials containing asbestos

c. Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos

d. Installation of products containing asbestos

e. Asbestos spill/emergency cleanup

f. Transportation

g. Disposal

h. Storage

i. Containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed

Under OSHA, Asbestos Abatement work is categorized into four classes:

Class I Work: Activities involving the removal of Thermal System Insulation (TSI) and surfacing Asbestos Containing Materials (ACM) and Presumed Asbestos Containing Material (PACM).

Class II Work: Activities involving the removal of ACM is not TSI or surfacing material. This includes wallboard, floor tile and sheeting, roofing, siding, shingles, and construction mastics.

Class III Work: Repair and Maintenance operations, where ACM, including TSI and surfacing ACM and PCM, is likely to be disturbed.

Class IV Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste, and debris from Class I,II, and III activities.

Conduct abatement work in accordance with the Class I, II, III, or IV Methods of Compliance as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 61-SUBPART M, 49 CFR 171, 49 CFR 172, FAC CHAPTER 62-257, and FL-STAT 469. Submit all required training certifications prior to commencement of work, and experience of Contractor's "Competent Person," Supervisor, and workers.

1.2 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7.1	(2011) Commodity Specification for Air; 5th Edition

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
40 CFR 763	Asbestos
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
AFSPCMAN 91-710	(2004) Range Safety User Requirements Manual
FAC CHAPTER 62-257	(2008) Florida Administrative Code, Asbestos Program
FL-STAT 469	(2010) Asbestos Abatement
KNPR 1840.19	KSC Industrial Hygiene Programs
KNPR 8500.1	KSC Environmental Requirements
KNPR 8715.3	KSC Safety Practices Procedural Requirements
NIOSH 7400	(1994) Standard Test Method for Asbestos and Other Fibers by PCM

1.3 DEFINITIONS

Competent Person - Per OSHA, one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

FLAC - Florida Licensed Asbestos Consultant as defined within the FL-STAT 469 ASBESTOS ABATEMENT.

IH - Contractor's independent Industrial Hygienist. This person is responsible for the oversight and approval of the abatement procedures and the health, safety, and welfare of those who it effects.

CIH - A Certified Industrial Hygienist is an individual who has met the minimum requirements for education and experience, and through examination, has demonstrated a minimum level of knowledge and skills in 16 rubric (subject matter) areas.

1.4 ADMINISTRATIVE REQUIREMENTS

1.4.1 Licenses And Permits

Submit a copy of asbestos consultant's license to the Contracts Administrator. Ensure that the FLAC possesses a current license and complies with all Federal, State of Florida and local regulations. Only those consultants who are licensed by the Department of Business and Professional Regulation(DBPR) are permitted to perform Asbestos Surveys or abatement specifications and plans as per Florida Statute 469.

Also submit a copy of Asbestos Contractor's License. Possession of a current asbestos contractor's license is mandatory, as well as securing all necessary licenses and permits associated with asbestos removal, transportation, and disposal as may be required by Federal, State, and local regulations. Only those Contractors who are certified and licensed by the State of Florida DBPR will be permitted to perform asbestos abatement activities at Kennedy Space Center.

Submit a copy of waste disposal permit and all disposal shipping manifests and tickets as they are obtained.

1.4.2 Certificates

Submit the following certificates:

a. Certification of participation (documentation showing current and 2 previous consecutive PAT test round results) in a proficiency analytical test (PAT) program such as or equivalent to the American Industrial Hygiene Association PAT or Asbestos Analytical Registry (AAR) accreditation certificate and Interlab QA/QC Program participation for the independent air monitoring agency selected by the Contractor before starting work.

b. Training Certifications and accreditation certificates for the independent air monitoring agency's on-site personnel and a copy of independent air monitoring agency's Quality Control Program.

c. Certification documents by the Contractor verifying that employees have been provided current respirator fit test, training, and medical examinations in compliance with 29 CFR 1926.

1.4.3 Safety Data Sheets (SDS)

Submit Safety Data Sheets (SDS) as required for materials to be used on the specified project.

1.4.4 Notification

When applicable, submit a Florida Department of Environmental Protection (DEP) "Notice of Demolition or Asbestos Renovation" (DEP Form 62-257.900(1)) to the DEP District Office. Provide copy of the notification to the Government as part of the Implementation Plan.

1.5 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project.

A “G” following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a “G”. Only delete an existing “G” if the submittal item is not complex and can be reviewed through the Contractor’s Quality Control system. Only add a “G” if the submittal is sufficiently important or complex in context of the project.

An "S" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Asbestos Consultant's License[; G]

Asbestos Contractor's License[; G]

Training Certifications[; G]

Implementation Plan[; G]

Air Monitoring Plan[; G]

Contingency Plan for Emergencies[; G]

Respiratory Protection Plan[; G]

Work Schedule[; G]

Initial Inspection[; G]

SD-06 Test Reports

Initial Exposure Assessments[; G]

Air Monitoring Reports[; G]

Work Site Entry Logs[; G]

Daily Site Inspection Logs[; G]

Waste Inventory[; G]

Waste Shipment Record (WSR)[; G]

SD-07 Certificates

Training Certifications[; G]

Safety Data Sheets[; G]

Proficiency Analytical Test[; G]

SD-08 Manufacturer's Instructions

Implementation Plan[; G]

SD-11 Closeout Submittals

Waste Disposal Permit[; G]

Disposal Shipping Manifests and Tickets[; G]

Daily Site Inspection Logs[; G]

Negative Pressure Logs[; G]

OSHA Compliance Inspection Records[; G]

Air Monitoring Reports[; G]

Independent Monitoring Data[; G]

Calibration Records[; G]

Waste Stream Inventory[; G]

1.6 IMPLEMENTATION PLAN

Prepare and submit a detailed, written Implementation Plan created, signed and sealed by a FLAC to the Government for approval, prior to the start of work, that includes the following:

a. Coordination drawings, in .DWG or .DGN electronic format, including site specific drawings of proposed work areas, clean room/change areas, mini-enclosures, shower, equipment room, waste loading/staging areas, locations of High Efficiency Particulate Air (HEPA) filtered negative pressure devices and exhaust points, work areas, emergency egress, and areas to be modified.

b. Detailed drawings for asbestos abatement systems consisting of fabrication and assembly drawings for all parts of the work in sufficient detail to enable the Government to check conformity with the requirements of the contract documents.

c. A copy of the applicable DEP Notification of Demolition/Renovation (DEP Form 62-257.900(1)).

d. Plan of action, including proposed procedures to be used in complying with the requirements of this specification, 29 CFR 1926, and other applicable regulatory requirements, sequence of asbestos abatement work, the interfaces of trades involved in the performance of work, posting of licenses, permits, etc., methods to be used to assure the safety of building occupants and visitors to the site, fiber migration procedure for ensuring other ACM and/or heavy metal hazards not in scope are not disturbed, disposal plan including location of approved disposal site, a detailed description of the methods employed to control pollution, and a detailed work schedule. Expand upon the method for removal of ACM, the use of portable HEPA ventilation systems, closing out of the buildings HVAC system, method of removal to prohibit visible emissions in the work area, and packaging of removed debris.

e. Details of the decontamination areas and procedures, locations of staging areas, posting of warning signs, and details of negative air system to be used in the work area.

f. Sketch(s) or drawing(s) of complete contract area(s) showing the shower room, clean room, drum staging area, decontamination and containment areas, the negative air system, and exits. Indicate designation of the "Competent Person" (CP), and Site Supervisor.

1.6.1 Air Monitoring Plan

Provide a written Air Monitoring Plan to be prepared under the direction of and signed/stamped by a FLAC specifying the air monitoring criteria and an action plan for implementation by the Competent Person.

Provide certification that the Contractor, his staff, and abatement workers (including Supervisors) have attended and successfully completed (an) asbestos abatement course(s) including refresher courses as set forth in FL-STAT 469 and in accordance with 29 CFR 1926 and 40 CFR 763.

Provide a written (OSHA compliant) Respiratory Protection Plan in accordance with 29 CFR 1910 including training in the care, use, and maintenance of respirators and fit test certification.

Provide a written description of respiratory equipment (name, type, model number) and protective clothing provided to the abatement workers.

1.6.2 Medical Examination

Provide medical documentation that all personnel assigned to the abatement project have been examined annually by a physician. Submit the physician's written opinion containing the results of the employee's medical examination in compliance with 29 CFR 1926.

1.6.3 Procedures for enforcement of Personal Hygiene Practices

Describe personnel work practices and personnel hygiene procedures in the work plan submittals.

1.6.4 Contingency Plans

Prepare and submit a contingency plan for emergencies including fire, accident, power failure, heating or cooling, negative air system failure, respirator supplied air system failure, or any other event that may require modification of the work area isolation procedures. Include in the plan specific procedures for decontamination or work area isolation, safe exiting, and the need for medical attention in the event of an emergency.

1.6.5 Additional Procedures

Submit any additional procedures (fall protection, confined space, etc.) and policies that are in effect to ensure worker safety and environmental, KNPR 8500.1, KNPR 8715.3,[and AFSPCMAN 91-710] requirements are met.

Establish, maintain, and make readily available for review all work site entry logs of all personnel entering and leaving the regulated work area by the on-site competent person indicating the date and time of entry and egress.

1.7 AIR MONITORING REPORTS

Obtain the services of an independent Air Monitoring agency/FLAC. Air samples will be analyzed by an independent Air Monitoring Agency accredited by the American Industrial Hygiene Association (AIHA) or personnel participating in the AIHA Asbestos Analyst Registry (AAR), for analysis of airborne asbestos concentration levels[, and submittal of Independent Monitoring Data taken during the abatement]. Provide a copy of the monitoring agency's Quality Control Program to Contracts Administrator prior to commencement of the abatement activities. Ensure that the individual performing the on-site air monitoring meets the requirements as set forth in FL-STAT 469 and 40 CFR 763, and performs sample collections in accordance with the approved Air Monitoring Plan under the direction of FLAC.

Perform all Air Monitoring under the direction of the FLAC using an independent Air Monitoring Contractor, in compliance with Florida Statute 469 requirements.

Calibrate pumps before and after each air sample and submit calibration records to the Government.

Submit daily Air Monitoring Reports. Include in the Air Monitoring Report the following information for each sample:

a. Sample identification, Sample location

b. Employee Name, Unique Identifying Number

c. Description of task being monitored

d. Exposure level results in (f/cc), sample period/8 hr. TWA

e. Monitoring instrument identification number

f. Pre-calibration, post calibration, and average flow rate of each sample

g. Sample date, start and stop times

h. Type of protective devices worn (if any)

i. Project identification number, Facility number and name

j. Sampling and Analytical Methods used

k. Contact name and company, and name of individual performing the sampling

l. Name of FLAC and license number reviewing air monitoring

1.7.1 Air Sample Analytical Method

Airborne fiber sampling and analytical procedures are to be analyzed by Phase Contrast Microscopy (PCM) in accordance with 29 CFR 1926 and NIOSH 7400 method.

1.7.2 Air Sampling Rate, Volumes and Frequency

Conduct daily monitoring utilizing sample rates, volumes and frequency in accordance with 29 CFR 1926 and retain for final submittal at closeout. The minimum number of samples or sample volumes may not be less than those specified below:

Sample Type	Volume	Minimum No. Samples	Location
Prior to set-up (within 24 hours)	1200 L	2	Regulated Area
Personal, During work	400 L	2	Personal B.Z.
Area samples, Adjacent to work area	1200 L	2	Regulated Area
Area samples at Negative Air Unit Exhaust	1200 L	1	In area of outlets

NOTE: The KSC IH may perform air sampling outside the regulated work area.

1.8 WORKER PROTECTION

Perform Initial Exposure Assessments and Employee Exposure Monitoring in accordance with 29 CFR 1926, part 1926.1101, under direction of the FLAC.

Select and provide respiratory protection to employees and ensure they are utilized in accordance with 29 CFR 1926.

Submit the Work schedule indicating the work days, hours, and the number of workers per shift. Include a bar chart to identify the individual milestones through to the completion of the project (i.e., number of days

to complete work site preparation, number of days to complete ACM removal, number of days to complete final cleaning and lockdown, etc.).

Submit the OSHA compliance inspection records as part of the closeout documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES AND SERVICES

The Government will make available at the work site, water at hose bibs and 120 Volt AC at receptacles for use. Provide water proof safety lighting where necessary for safe, adequate illumination.

Ensure that all electrical equipment used inside the work areas is powered from an Underwriters Laboratory (UL) approved Ground Fault Circuit Interrupter (GFCI). Do not exceed the manufacturer's limits per GFCI. Make all necessary connections and restore the site connections to the original condition or better, before project completion.

Ensure that all energized or pressurized systems inside the work area have been locked out, tagged out or otherwise rendered safe.

Provide temporary water from the existing building water source to control the generation of airborne dust, to allow for area, personnel, and equipment decontamination, and to supply decontamination unit needs. Also provide a backflow preventer at the source.

Provide temporary sanitary drainage piping to the decontamination unit sump and to the shower unit at a minimum slope of 2.0 percent, and temporary drainage piping to waste water pump and existing drain in accordance with local standards and as approved by the Contracts Administrator.

3.2 WORK AREA PREPARATION

The Government will re-arrange equipment and storage areas to the extent of providing a direct and unobstructed path to the work area(s). During ACM removal, confine equipment and employees to the designated work area(s).

Unless otherwise directed by the Contracts Administrator, establish and maintain a [8 meters] [25-foot] [_____] access control barrier zone(s) around the designated work area(s). Interference with the functional operation of the building occupants outside these areas is not permitted.

Ensure that all building supply and return air ducts from the mechanical system are isolated to eliminate air flow into or out of containment area(s).

3.2.1 Pre-Cleaning

Shut down HVAC systems and seal all critical barriers before initiating pre-cleaning actions. Seal, with 0.15 mm 6 mil minimum thickness plastic sheeting, all openings, windows, corridors, doorways, elevator openings,

skylights, ducts, grilles, diffusers, and any other penetrations between the contaminated work areas and uncontaminated areas.

Pre-clean all movable objects identified as contaminated by the Contracts Administrator or designated representative within the work area using a HEPA filtered vacuum and wet cleaning methods as appropriate. Remove these objects after cleaning and store in a protected area.

Pre-clean all surfaces in the work area using HEPA filtered vacuums and/or wet cleaning methods as appropriate. Methods that would raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, are PROHIBITED. Pay detailed attention to machinery or areas behind grilles and gratings.

Do not remove or otherwise disturb asbestos containing building materials during the pre-cleaning phase.

3.2.2 Work Area(s) Notification

Inform all other Contractors and personnel on the site of the abatement work, of the nature of the work with ACM and/or PACM, of the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other Contractor employers are not exposed to asbestos in accordance with 29 CFR 1926.

Use industry controls and work practice methods in accordance with 29 CFR 1926. Ensure that the daily site inspection logs are posted at the jobsite by the on-site competent person.

Use flame resistant, 0.15 mm 6 mil polyethylene sheeting when constructing Negative Pressure Enclosures (NPE) or decontamination areas.

3.3 WASTE LOAD-OUT UNIT

Establish a waste load-out unit to provide for interim secure storage. Include an equipment room for storage of asbestos-contaminated items (drums, tools, equipment). Decontaminate all equipment and waste containers prior to being taken out of the work area(s).

All asbestos-containing waste material is to be sealed in leak-tight disposal containers. Thoroughly wet all waste within the disposal containers. Maintain proper labeling protocols for all running and final inventory of filled disposable containers.

3.4 SIGNS AND MARKINGS

Post signs before commencing asbestos work as required in 29 CFR 1926. Post signs at the perimeter of the asbestos work areas, along the route of the temporary waste material holding (Drum Staging) area, and at all entrances to asbestos work areas. Ensure that the signs are conspicuous and legible.

Post telephone numbers and locations of emergency services including, but not limited to, fire, ambulance, doctor, and hospital, at the regulated area.

Post one copy of all permits at the work site perimeter in an accessible location outside the regulated area.

Post one copy of the Abatement Contractors current license at the work site perimeter in an accessible location outside the regulated area.

Post hazard communication notification signs in accordance with KNPR 1840.19requirements.

3.5 NEGATIVE AIR SYSTEM

Construct Negative Pressure Enclosures (NPE's) as required by 29 CFR 1926.

Duct each of the negative air units through the containment barrier walls to the outside of the work area(s). When the building is occupied, ensure that the ducts exhaust into the outside air; otherwise, ducts may exhaust into an area of the building beyond the critical barriers. Never exhaust the units into the work area(s).

Provide each unit with temporary back-up electrical power (120 Volt AC) in the event of power failures or outages.

3.5.1 Testing

Design the negative air system to provide a minimum of four (4) air changes per hour and test before any work is begun. After the work area has been prepared, the decontamination unit set up, and the negative air units(s) installed, test the system. Before beginning abatement activities, an Asbestos Abatement Pre-Work Inspection checklist (KSC Form 28-1230A) will be completed by the qualified IH working under the direction of an FLAC to verify the adequacy of the containment and work area. Once activated, ensure the negative air exhaust unit(s) remain in operation until final clearance air monitoring has been performed. Maintain daily negative pressure logs for review by the FLAC and submit as part of the closeout documents.

Install a differential pressure meter or manometer to continuously measure pressure differential between inside and outside the work area for all Class I activities which utilize a NPE. Maintain a minimum pressure differential of 0.5 mm 0.02 inch of water column.

3.6 RESPIRATORY PROTECTION

Instruct and train each worker involved in asbestos abatement in proper respirator use and care. Fit all respirators by approved qualitative or quantitative test. Use respiratory protection appropriate for the fiber level encountered in accordance with initial assessment and if conditions change in the Work Area and as specified herein, or as required for other situations encountered.

3.6.1 Air Quality for Supplied Air Respiratory Systems

Provide breathing air used in Type "C" supplied air respiratory systems that meets or exceeds CGA G-7.1, standards for Grade D air.

3.7 REMOVAL OF ASBESTOS

Use industry controls and work practices for all operations in accordance with 29 CFR 1926 Methods of Compliance for Class I, II, III, or IV asbestos work. The abatement contractor is responsible for these practices.

Ensure that all Class I, II, III and IV work is supervised by an on-site Competent Person or designated representative at all times that work is in progress.

Following removal of contaminated items and asbestos material, seal the edges of the adjacent surfaces that were exposed when the asbestos was removed, with an asbestos bridging sealant/encapsulant.

3.8 DAILY HOUSEKEEPING

Maintain a clean work area in accordance with 29 CFR 1926. Perform the following housekeeping functions at the end of each shift or prior to leaving the work site unattended:

a. Prepare contaminated waste for disposal by packaging the waste and removing it from the work area.

b. HEPA vacuum the work area.

c. Visually inspect the polyethylene in the work area and other high traffic areas.

3.9 CLEANING PROCEDURES

Clean the work area at the end of each day's abatement activities. Designate a separate, secured area within the work area for storage of debris until it can be properly disposed. Secure the work area after termination of the work day to prevent entry. Regularly dispose and replace disposable supplies, such as mop heads, sponges, and rags. Clean all equipment by HEPA vacuuming and wet wiping.

Clean all work areas in which abatement operations have been completed, starting at the ceiling and working down to the floors, by HEPA vacuuming and wet wiping. Before removal of worksite access controls and re-occupancy inspection by the Government, and upon satisfactory final clearance air sampling, and removal of polyethylene sheeting, perform a final cleaning (wet wipe) of all surfaces within the work area.

3.10 INSPECTION

Do not commence removal of asbestos materials before the qualified IH under the direction of a FLAC gives concurrence to proceed on the Asbestos Abatement Pre-Work Inspection (checklist KSC Form 28-1230A).

3.10.1 Initial Inspection

The Contractor and the FLAC or personnel working under direction of the FLAC will conduct a walk-through of the work area before beginning the abatement work to review existing conditions and ensure safe and practical conditions for the work to be implemented. Document any damage to structures, surfaces, and equipment that could be misconstrued as damage resulting from work, and immediately submit to the Contracts Administrator.

Perform background sampling for work areas in accordance with 29 CFR 1926 before beginning the abatement work. Any debris, cleanliness conditions, or damaged ACM must be brought to the attention of the Contract Administrator at this time.

3.10.2 Daily Inspection

Maintain a work site entry log of all personnel who enter the regulated work area. Through continuous surveillance and inspections of the worksite, ensure the integrity of containment, proper function of the negative pressure system, and posting of signs and labels. Also ensure, through frequent inspections during each work shift, that negative pressure is maintained, appropriate work practices are followed, appropriate protective clothing and equipment are used, and worker decontamination procedures are being followed.

Ensure that critical barriers and negative pressure enclosures remain effectively sealed and taped. Take immediate action to remedy defects immediately upon discovery. Details of the inspections are to be included in the daily inspection log and posted in an accessible location outside the regulated area.

Provide updated copies of the Air Monitoring Reports, daily site inspection logs and waste stream inventory to the Contracts Administrator at the end of each week of the abatement work.

NASA/Kennedy Space Center reserves the right to conduct periodic inspections and air monitoring in the work area(s). If the work area is unsafe as determined by the Contracts Administrator, the Contracts Administrator, will require a work stoppage until the unsafe conditions are corrected.

3.10.3 Final Inspection

The thoroughness of asbestos removal is to be evaluated by visually inspecting the affected surfaces for residual asbestos material and accumulated dust followed by air sampling. Evidence of residual asbestos or asbestos debris on any adjacent surfaces upon completion of the work is not acceptable.

Upon completion of the work, conduct a thorough visual inspection of the work area by the Abatement Contractor and the qualified IH working under the direction of a FLAC to ensure that no residual asbestos material, dust or debris remains. Document final inspections on the Asbestos Abatement Clearance Inspection Checklist (KSC Form 28-1231A), to be completed by a qualified IH under the direction of a FLAC.

If applicable, final aggressive air sampling is to be performed by the KSC IH for each NPE work area after completion of a satisfactory visual inspection. The clearance criteria is 0.01 fibers per cubic centimeter (f/cc) of air as determined by PCM. Satisfactory fiber counts from all final samples are to be less than 0.01 f/cc. If any of the final air samples contain greater than 0.01 f/cc, repeat the final cleaning operation and re-test the area until satisfactory clearance levels are obtained.

Collect five PCM final air samples for the first 5000 square feet of containment plus one additional PCM final air sample for each additional 5000 square feet or one air sample per room, whichever is greater. The number of final air samples may be reduced for small enclosures of less than approximately 2500 square feet. In no case may fewer than two final samples be collected for any enclosure. The qualified IH working under the direction of a FLAC will make this determination.

Ensure that the clearance air sample volumes meet the minimum volumes as indicated for analysis by the NIOSH 7400 method.

3.11 ASBESTOS WASTE AND CONTAMINATED MATERIALS

3.11.1 Removal of Asbestos Waste Materials

For purposes of this paragraph, asbestos waste materials are defined as those materials which contain or have been contaminated by asbestos and are not planned to be encapsulated and remain at the job site. They are primarily removed asbestos, disposable clothing and safety equipment, polyethylene sheeting, contaminated amended water, vacuum cleaner contents, and filtration media.

Contain all asbestos waste material in two 0.15 mm 6 mil polyethylene disposal bags, or two 0.15 mm 6 mil disposal bags and a sealed leak-tight container such as, but not limited to, a steel or fiberboard drum. Pack the asbestos waste material while still wet. Clean the external surface of the waste containers by HEPA vacuuming and wet wiping before moving from the work area. Protect the interior of truck or dumpster with two layers of polyethylene sheeting.

3.11.1.1 Waste Inventory

Maintain Waste Inventory records of all generated waste drums or containers. Indicate the location and approximate quantity of material in each container. Clearly label and mark all disposal containers, dumpsters, and trucks, in accordance with 40 CFR 61-SUBPART M, 29 CFR 1910 of OSHA's Hazard Communications Standard, and 49 CFR 171 and 49 CFR 172, Hazardous Substances.

Provide conspicuous, legible labels, affixed to plastic bags and drums indicating the name of the waste generator and the location (facility name and number) where the waste was generated.

3.11.1.2 Waste Shipment Record

Provide a Waste Shipment Record (WSR) to the waste site owner in accordance with the instructions in 40 CFR 61-SUBPART M.

For non-friable asbestos that will be disposed at the KSC/Schwartz Road Landfill, provide a completed landfill disposal verification form (KSC Form 28-1064NS) send to the Contracts Administration. NOTE: Regulated ACM is not permitted for disposal at KSC/Schwartz Road Landfill.

3.11.2 Work Area Disposal

After final inspection has been completed and the work area is released for occupancy, shut off and remove the Negative Air System units. Unseal all entrances and exits. Dispose of all plastic sheeting, tape, and any other trash and debris, except for critical barriers, in sealable plastic bags, or in drums and moved to the staging area. After final wet wipe of the work area and satisfactory clearance air sampling, dismantle critical barriers and the decontamination unit.

3.11.3 Decontamination Area And Support Area Disposal

Dismantle the decontamination area after the work area is released by the KSC IH for re-occupancy. Vacuum all surfaces of the decontamination unit

before it is disassembled.

3.12 WASTE TRANSPORTATION AND DISPOSAL

Transport and dispose of asbestos waste in full compliance with 40 CFR 61-SUBPART M, SUBPART A, 49 CFR 171 and 49 CFR 172.

3.13 ASBESTOS ABATEMENT NOTICE AND CHECKLIST

An Asbestos Abatement Pre-Work Inspection form (KSC Form 28-1230A) and an Asbestos Abatement Clearance Checklist (KSC Form 28-1231A) will be provided by the Contracts Administrator. Send copies to the Contracts Administrator upon satisfactory completion of the work. Notify KSC IH and the Contracts Administrator at least three days prior to the planned commencement of work. Coordinate and schedule all Pre-Work and Clearance Site inspections with KSC IH. The completed forms are to be used to establish approval of the containment, work practices and final acceptance/re-occupancy of the work area(s).

3.14 FINAL ACCEPTANCE

3.14.1 Closeout Submittals

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NOTE: Section 01 78 00 CLOSEOUT SUBMITTALS should be reviewed and revised to meet any required performance by the Contractor before the project is considered complete.
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Within 10 days after the completion of work, submit to the Contracts Administrator a written summary and copies of the following items:

a. Notification of Demolition/Renovation

b. Waste Disposal Permit

c. Disposal Shipping Manifests and Tickets

d. Daily Site Inspection Logs

e. Negative Pressure Logs

f. OSHA Compliance Inspection Records

g. Air Monitoring Reports

h. Independent Monitoring Data

i. Calibration Records

j. Waste Stream Inventory

The work will not be considered complete until the asbestos materials identified herein have been abated, the areas cleaned, satisfactory

clearance air monitoring completed, all asbestos contaminated waste has been properly disposed of, and all project close out documents have been received and approved by the Contracts Administrator.

-- End of Section --