JOHNSON STUDENT CENTER DEMOLITION

SANTA ANA COLLEGE

1530 WEST 17TH STREET

SANTA ANA, CA 92726

RANCHO SANTIAGO COMMUNITY COLLEGE DISTRICT

2323 NORTH BROADWAY

SANTA ANA, CA 92726

PROJECT MANUAL

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SECTION 022623
ASBESTOS & HAZARDOUS MATERIALS ABATEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. The work under this section includes the furnishing all labor, equipment and materials necessary to remove asbestos-containing materials from the Johnson Student Center prior to the demolition of this building by others. The work will also include the decontamination of suspended ceiling system components within the ground floor bookstore below spray applied fireproofing. All work shall be performed in accordance with applicable federal, state, and local requirements and statutes. The work will be performed by persons knowledgeable, qualified, trained, and experienced in the removal, treatment, handling, transportation, and disposal of asbestos-containing material.

1.2 SCOPE OF WORK

A. General Requirements: Work of this section includes but is not limited to the following:

1. Obtaining all notifications and permits required to perform the work.
2. Developing a detailed asbestos removal work plan, including: work sequence; work area isolations; decommissioning HVAC and Electrical systems within the building; installing a temporary power system with ground-fault interruption/protection to be used in the removal areas; removal methods; and transport/disposal procedures. This work shall be coordinated with the lead-related abatement work plan I Section 02 26 26.
3. Removing and legally disposing of the identified asbestos-containing materials, and asbestos-contaminated materials, to allow building demolition by others.
4. Removing and legally disposing of all asbestos-containing materials (ACM) and asbestos contaminated materials disturbed by the project and removed from the project site.
5. Removing and legally disposing of the identified light ballasts and florescent light tubes
6. Thoroughly cleaning the area of work and obtaining final visual inspection approval from the RSCCD's Representative. Clearance air monitoring performed by Phase Contrast Microscopy (PCM) (NIOSH Method 7400) will be performed for negative pressure enclosures.
7. The Contractor shall retain a third party asbestos consulting firm to perform an exposure assessment and perform exposure monitoring. The third party consulting firm shall perform monitoring for a minimum of two days while asbestos-related demolition is being performed.
8. The Contractor shall perform employee exposure monitoring as required by CalOSHA during the project.

B. The Contractor shall remove, transport, and properly dispose the following material associated with the Johnson Student Center. The estimated quantities shall be field verified:

1. 12” tan floor tile/mastic in the Bookstore and adjacent support spaces. The estimated quantity is 3,800 sq. ft.
2. 9” tan floor tile/mastic in the Bookstore stairwell/storage room and several rooms in Financial Services Dept. - Floor 2. The estimated quantity is 1,300 sq. ft.

3. Thermal System Insulation on water lines above the Bookstore restroom ceilings. Eight pieces of insulation have been confirmed, but additional pieces may exist.
4. Sprayed fireproofing on structural steel beam above the main ceiling in the Bookstore. Debris was observed on the tops of the lay-in ceiling panels. The estimated quantity is 4,000 sq. ft. of material.
5. Floor tile mastic below carpet in Classrooms 106/107. The estimated quantity is 1,100 sq. ft.
6. 12" rose floor tile/mastic in the west end of the ground floor main corridor. The estimated quantity is 800 sq. ft.
7. 12" white floor tile/mastic in the floor 2 food serving area, dining area and corridor. The estimated quantity is 5,500 sq. ft.
8. Flashing cement applied to the roof penetrations and curbs. The estimated quantity is 60 – 100 sq. ft.
9. Fire-rated door cores associated with storage rooms. The estimated quantity is five doors.
10. 725 light ballasts that potentially contain PCB fluids
11. 1,325 four-foot light tubes throughout the building.

1.3 REQUIRED LICENSURE

A. Contractor shall be licensed by the State of California, Contractors State License Board and be registered to perform asbestos related work with the Division of Occupational Safety and Health, Department of Industrial Relations. At a minimum, Contractor shall hold the following license classifications:

1. ASB -Asbestos Certification Supplement

B. Transportation of Friable and Non-Friable Asbestos-Containing Materials: Contractor shall itself be, or have a subcontractor that is, a registered hazardous waste transporter with the State of California, Department of Toxic Substances Control.

1.4 APPLICABLE DOCUMENTS AND REGULATIONS

A. It is the responsibility of the Contractor to know the current regulations controlling work and to perform all related work in accordance with such regulations that provide for worker and public safety against asbestos exposure.

B. The publications listed below form a part of this specification to the extent referenced. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the more stringent requirements shall apply.

C. CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1910	Occupational Safety and Health Standards for General Industry
29 CFR 1910.1200	Hazard Communication
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.145	Specifications for Accident Prevention Signs and Tags
29 CFR 1910.1020	Access to Employee Medical Records
29 CFR Part 1926	Occupational Safety & health for Construction
29 CFR 1926.1101	Construction Standards for Asbestos, Tremolite, Anthophylite and Actinolite

D. U.S. ENVIRONMENTAL PROTECTION AGENCEY (EPA)

40 CFR 61 Sub A & B	General Provisions
40 CFR 61 Sub M	National Emissions Standard for Hazardous Air Pollutants (NESHAP)
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 763	Sub G Worker Protection Rule
40 CFR 763	Asbestos Hazard Emergency Response Act (AHERA)

E. U.S. DEPARTMENT OF TRANSPORTATION (DOT)

49 CFR 171 & 172	Transportation of Hazardous Waste

F. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701 (1989) Methods of Fire Test for Flame Resistant Textiles and Films

G. UNDERWRITERS LABORATORIES (UL)

UL 586 (1990) High-Efficiency Particulate Air Filter Units

H. CALIFORNIA CODE OF REGULATIONS (CCR)

Title 8 5208	General Industry Safety Orders -Asbestos
Title 8 Article 2.5	Registration -Asbestos Related Work
Title 8 5194	Hazard Communication
Title 81529	Construction Industry Safety Orders -Asbestos
Title 22 Div. 4 Cpt. 30	Hazardous Waste Handling

I. CALIFORNIA LABOR CODE

Section 6501.5-6505.5

J. SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

Rule 1403 Asbestos Emissions From Demolition/Renovation Activities

1.5 NOTIFICATIONS AND PERMITS

A. Contractor shall make all required written notifications or applications to regulatory agencies including the following:

1. South Coast Air Quality Management District SCAQMD Notification shall be in accordance with Rule 1403.

2. California Division of Occupational Safety and Health

B. Notification shall be in accordance with Section 341.9 of Title 8 of the California Code of Regulations

1.6 SUPERVISOR/COMPETENT PERSON, FOREPERSON, AND WORKERS

A. The Contractor shall have an Asbestos Supervisor/Competent Person present at all times while asbestos-related work on this Contract is in progress.

B. The Asbestos Supervisor/Competent Person shall have successfully completed a five (5) day EPA-approved Asbestos Abatement Contractor/Supervisor training course, and be thoroughly familiar and experienced with asbestos removal and related work, and shall be familiar with and enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of all EPA, OSHA, and NIOSH requirements and guidelines.

C. In addition to the Asbestos Supervisor/Competent Person, the Contractor shall furnish one (1) or more forepersons who have successfully completed a five (5) day EPA-approved Asbestos Abatement Contractor/Supervisor training course, and who are familiar and experienced with asbestos abatement and its related work, safety procedures, and equipment.

D. It shall be a requirement of this Contract that the Contractor's Asbestos Supervisor/Competent Person and one or more of the foremen be onsite at all times while work is in progress. A foreman will be required to conduct inspections of the work practices, and enclosure condition inside the work area at least three (3) times during each work shift.

E. All workers shall, at a minimum have successfully completed a four (4) day EPAapproved Asbestos Abatement Worker training course.

1.7 SUBMITTALS

A. Within 10 working days of receiving the notice to proceed, submit to the RSCCD representative the following documents:

1. Copies of the written notification to the following regulatory agencies:
    a. SCAQMD Rule 1403
    b. California Division of Occupational Safety and Health
2. Copies of waste haulers Hazardous Waste Transporter Registration and Environmental Protection Agency Acknowledgment of Notification of Hazardous Waste Activity.
3. Identification of the landfill to be used for the disposal of the asbestos-containing waste generated at the project site and the landfill disposal and packaging requirements.
4. A written asbestos abatement work plan identifying work sequence, abatement duration, dust control measures, work area preparation, personal protection equipment to be utilized, asbestos-containing materials removal procedures, asbestos-containing/contaminated debris cleanup and disposal procedures, and waste handling, storage, and disposal procedures.
5. Manufacturer's certification that HEPA vacuums, differential pressure air filtration devices and other local exhaust ventilation equipment conform to ANSI Z9.2-79.
6. Current SCAQMD registration of all HEPA vacuums, differential pressure air filtration devices.
7. Manufacturers product data and material safety data sheet(s) for all chemical products to be used on the site.
8. Identification of the project's Asbestos Supervisor/Competent Person who meets the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529 and is experienced in administration and supervision of asbestos abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc.
9. Documentation that the Contractor's employees performing asbestos removal, disposal, and air sampling operations have received training which meets the criteria of the Federal EPA Model Accreditation Plan (40 CFR Part 763, Subpart E, Appendix C).
    a. Training certification shall be provided prior to the start of work involving asbestos

abatement, for all of the Contractor's workers, forepersons, and Asbestos Supervisors/Competent Persons. Training shall meet the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529 and the criteria of the Federal EPA Model Accreditation Plan (40 CFR Part 763, Subpart E, Appendix C). Training shall be provided prior to the time of job assignment and, at least, annually.

10. Documentation from a physician that employees or agents who may be exposed to airborne asbestos fibers in excess of the Permissible Exposure Limit have received medical monitoring to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. Contractor shall be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g. high temperatures, humidity, and chemical contaminants) that may impact on the employee's ability to perform work activities. Medical monitoring shall be performed in accordance with the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529.
11. Documentation of respirator fit-testing for Contractor employees and agents who must enter the work area. This fit-testing shall be in accordance with qualitative procedures as required by OSHA regulations or be quantitative in nature.
12. Documented NIOSH approvals for respiratory protective devices utilized on site, including manufacturer's certification of HEPA filtration capabilities for cartridges and filters.

B. Upon completion of all asbestos abatement activities, submit to the RSCCD's Representative, documentation that includes, without limitation, the following:

1. Work area entry/exit logbook. The logbook must record the name, affiliation, time in, and time out for each entry into the work site.
2. Material Safety Data Sheets (MSDS) for solvents, encapsulants, wetting agents and replacement materials, as necessary.
3. OSHA required personal air monitoring results.
4. Accident/ incident reports where injury or damage has occurred on or to the RSCCD's property.
5. Hazardous waste manifests, non-hazardous waste data forms, trip tickets and disposal receipts for asbestos waste materials removed from the work area within 72 hours of transport. Send the information to:

Rancho Santiago Community College District
Facility Planning, District Construction and Support Services
2323 N. Broadway, Suite 112, Santa Ana, CA 92706
Attention: Steve Marshall, Facilities Project Manager

1.8 NOTICES AND POSTINGS

A. Post in the decontamination unit, a list containing the names, addresses, and telephone numbers of the Contractor, RSCCD's Representative, Project Environmental Manager, and emergency contact numbers.

B. Additional postings shall include:

1. Visitor entry and exit log.
2. Employee daily sign in/out log.
3. Work area entry and exit procedures.
4. Emergency procedures.

C. One copy of the Cal-OSHA regulations.

D. Posted Warnings and Notices: The following regulations, warnings, and notices shall be posted at the work site in accordance with 29 CFR Part 1926.1101 and 8 CCR Part 1529.

1. Warning Signs and Labels: Warning signs shall be provided at building entrances and approaches to asbestos abatement areas. Signs shall be located at a sufficient distance from the asbestos control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the asbestos control area.
2. Post at least two (2) safety warning signs, in English and Spanish, which follow the "Sample Format Warning Sign" shown below:

Sample Format Warning Sign Minimum Size -24" x 36" Material
-Aluminum or Fiberglass Script:

DANGER

ASBESTOS CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING AREA REQUIRED IN THIS AREA

Color -Black Letters on Red Background

1.9 WORK AREA SECURITY

A. The asbestos work control area shall be restricted only to authorized personnel, including Contractor, Contractor's employees, RSCCD's Representative(s), and state, and local inspectors.

B. Entry into the asbestos work control area by unauthorized individuals shall be reported immediately to the RSCCD's Representative.

C. Contractor shall be responsible for Project site security during asbestos-related demolition operations in order to protect work efforts and equipment.

1.10 WORK SEQUENCE

A. Work Sequence: The following is the work sequence for the project:

1. The building will be vacant; therefore, there are no restrictions on how the work is completed. Lead-related removal work identified in Section 02080 may be performed in conjunction with the asbestos-related.

1.11 PERSONAL PROTECTION AND SAFETY

A. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his/her appliances, methods, and for any damages which may result from his/her operations, improper construction practices, or maintenance. He shall erect and properly maintain at all times as required by the conditions and progress of the work, proper safeguards for the protection of workmen and the public and shall post warning signs around the job site.

B. Respiratory protection requirements:

1. All respiratory protection programs shall be established in accordance with the respiratory protection requirements of 29 CFR Part 1910.134, 8 CCR Part 5144, 29 CFR Part 1910.1001, and 29 CFR Part 1926.1101. Copies of these regulations are included herein by reference and shall be considered as a requirement of these Specifications.

2. All respirators used shall be selected from those approved by NIOSH for use in atmospheres containing asbestos fibers.

3. Work activities associated with the removal of non-friable asbestos-containing materials (i.e., floor tile and roofing material) shall be conducted in a minimum of half-face air purifying respirators with P-100 filters.

4. Respirators shall be quantitatively fit-tested a minimum of every 12 months. Either the standard Irritant Smoke Protocol or the Isoamyl Acetate Protocol may be used.

C. Provide workers and authorized visitors with sufficient sets of protective full body impervious protective clothing. Such clothing shall consist of full body coveralls and headgear. Provide eye protection and hard hats as required by applicable safety regulations. Reusable type protective clothing and footwear shall be left in the equipment room until the end of the asbestos abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos or asbestos-containing material. Disposable type protective clothing, headgear, and footwear may be provided.

D. Provide and post, in the equipment room and the clean room, the decontamination and work procedures to be followed by workers and authorized visitors as described in these Specifications.

E. Provide and post, in the equipment room and the clean room, the decontamination and work procedures to be followed by workers and authorized visitors as described in these Specifications.

F. Worker Protection Procedures:

1. Each worker and authorized visitor shall, upon entering the job site remove street clothes in the clean room and put on a respirator and clean protective clothing before entering the equipment room or the work area.

2. All workers and authorized visitors shall, each time they leave the work area; remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except respirators; still wearing the respirator proceed to the showers, clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves.

3. Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean room and dress in clean clothes at the end of each day's work, or before eating, smoking, or drinking. Before reentering the work area from the clean room each worker and authorized visitor shall put on a clean respirator and shall dress in clean protective clothing.

4. Contaminated work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement, the footwear will either be disposed of as contaminated waste, or will be bagged and sealed for use at another abatement project.

5. Workers removing waste containers from the equipment decontamination enclosure shall enter the holding area from outside wearing a respirator and dressed in clean disposable coveralls. No worker shall use this system as a means to leave or enter the washroom or the work area.

6. Workers shall not eat, drink, smoke, or chew gum or tobacco while in the work area.

7. Workers shall be fully protected with respirators and protective clothing from the time of first disturbance of asbestos-containing or contaminated materials prior to commencing actual asbestos abatement and until final cleanup is completed.

G. If evacuation of the work area is required by contaminated personnel due to an emergency, all work efforts shall stop, and all forces shall be directed at minimizing the area contamination, cleanup operations, and first-aid procedures. These activities shall be noted in the daily logbook.

H. During work activities requiring decontamination procedures, the Contractor shall provide a means of communication for the workers inside the work area without requiring personnel to enter or leave the work area. The method of communication shall be a two-way radio, localized wire-connected telephone, or similar system. This communication system shall remain intact until the final isolation plastic is removed. Then all equipment shall be wiped down; HEPA vacuumed or disposed of as asbestos- contaminated material.

I. Adequate shower facilities shall be provided by the Contractor. An employee leaving the work area shall follow all decontamination procedures necessary or as described herein.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Handling and Storage:

1. Deliver all materials to the project in the original package(s), container(s), or bundle(s) bearing the name of the manufacturer, brand name and the model number.

2. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

3. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with the applicable regulations.

B. Plastic (Polyethylene) Sheeting: Provide 6-mil thickness or greater polyethylene sheeting as specified in sizes to minimize the frequency of joints. Fire retardant polyethylene sheeting is required.

C. Tape: Provide two inch or wider duct tape capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials. Duct tape shall be capable of adhering under both dry and wet conditions, including use of amended water.

D. Spray Cement: Provide aerosol based spray adhesive specifically formulated to stick tenaciously to sheet polyethylene.

E. Surfactant: Provide a 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ester, or equivalent and mix with water to provide a concentration of one ounce surfactant to 5 gallons of water.

F. Impermeable Containers: Provide impermeable containers suitable to receive and retain any asbestos-containing or contaminated materials until disposal at Disposal Site labeled in accordance with OSHA Regulation 29 CFR 1910.1101, DOT 49 CFR 171-177, Title 8 CCR and SBACPD. Containers must be both air and watertight and must be resistant to damage and rupture. Plastic bags shall be a minimum of 6-mil thick.

G. Warning Labels and Signs: Provide warning labels and signs as required by OSHA Regulation 29 CFR Part 1910.1101, Title 8 CCR Part 1529 and SBAPCD Rule 1001.

H. Other Materials: Provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

I. Solvents used for the removal of resilient flooring mastics shall be low-odor.

2.2 TOOLS AND EQUIPMENT

A. Provide all tools and equipment necessary to perform the required asbestos removal/abatement.

B. Air Filtration Equipment: High Efficiency Particulate Air (HEPA) filtration systems shall be equipped with filtration equipment in compliance with ANSI Z9-2-79, local exhaust ventilation. No air movement system or air filtering equipment shall discharge unfiltered air outside the work area. A pressure differential system shall be established in the work area continuously (24 hours per day) from the start of the work in the area until the area has been decontaminated and certified as such by the required testing. The system shall produce a minimum of four filtered air changes per hour in the work area and maintains a pressure differential of 0.020-inches water gauge between the inside and outside of the work area. All filtered, exhausted air shall be discharged outside the building away from any building air-intake devices (unless stated otherwise).

C. Manometer: A continuous recording monitor shall measure and record the difference in air pressure between that inside the work area from that outside the work area. The recording system shall be accurate to the nearest 0.001 inches of water pressure differential and be equipped with an alarm that sounds if the difference becomes less than 0.020-inches water gauge.

PART 3 – EXECUTION

3.1 ASBESTOS REMOVAL PREPARATION PROCEDURES

A. General Work Area Preparation: Contractor shall perform the following general work area preparation procedures prior to commencement of any abatement activities:

1. Danger signs meeting the specifications of 29 CFR Part 1926.1101 and 8 CCR 1529 shall be posted at any location and approaches to locations where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to reduce or avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. The signs shall be in accordance with Article 1.09.0.2 of this Section.

2. Asbestos handlers shall don personnel protective equipment as required in Article 2.02 of this Section.

3. Contractor shall shut down and lock out electric power to work areas, where necessary, to provide a safe work environment. Contractor shall provide temporary power source and equipment, including ground faulting, in compliance with all applicable electrical code requirements and Cal-OSHA requirements for temporary electrical systems. The Contractor shall utilize a licensed electrician to perform all electrical power shut down and temporary power installation. All electrical equipment used during the removal of asbestos-containing materials shall be connected to a Ground Fault Interrupted (GFI) circuit.

4. Heating, ventilating, and air-conditioning (HVAC) system components that supply, return, or that pass through the work area shall be shut down and locked out.

5. The Contractor shall isolate the various asbestos removal work areas from areas where no asbestos related work is required. Windows, doorways, corridor entrances, drains, ducts, grilles, grates, diffusers, and other openings will be considered “critical barriers” and sealed with two layers of polyethylene sheeting and duct tape.

6. Emergency and fire exits from the work areas shall be maintained and adequately marked. Alternative exits shall be established that are satisfactory to the RSCCD and local fire regulations.

7. Contractor shall construct and maintain at least one three-stage decontamination unit. This decontamination unit shall be constructed in accordance with the requirements set forth in Article 3.02 of this Section. The asbestos worker wash/decontamination station may be used as the lead worker wash/decontamination station.

B. Resilient Flooring Removal Preparation: In addition to the requirements of Article 3.01A above, the following preparation procedures shall be used in areas where asbestos-containing resilient flooring and mastic will be removed:

1. Wall surfaces are not required to be covered, however, the walls shall not be allowed to be contaminated with asbestos-containing mastic residue.

2. Install worker decontamination unit described in Article 3.02 or as agreed upon with the Project Environmental Manager.

3. A pressure differential system shall be established that produces a minimum of four filtered air changes per hour in the work area and maintains a pressure differential of 0.02-inch water gauge between the inside and outside of the work area. The pressure differential system shall not be exhausted into occupied areas of the building.

C. Fireproofing and Thermal System Insulation Removal: In addition to the requirements of Article 3,01A, the following preparation procedures shall be used in areas where a fully contained regulated work area is required to remove friable asbestos containing material:

1. Floors shall be covered with one layer of 6-mil polyethylene sheeting.
2. The area around where pipe fitting insulation will be removed using glove bags shall be isolated with a full containment or mini-enclosure. The walls or the full containment or the walls of the mini-enclosure shall be constructed with one layer of 6-mil polyethylene sheeting.
3. Install worker decontamination unit described in Article 3.02 or as agreed upon with the Project Environmental Manager.
4. A pressure differential system shall be established that produces a minimum of four filtered air changes per hour in the work area and maintains a pressure differential of 0.02-inch water gauge between the inside and outside of the work area. The pressure differential system shall not be exhausted into occupied areas of the building.
5. Glove bags shall be installed in accordance with the procedures outlined in 29 CFR 1926.1101.

D. Flashing Cement Removal: In addition to the requirements of Article 3.01A, the following preparation procedures shall be used where non-friable asbestos-containing roofing materials will be removed:

1. Isolate the asbestos removal work area below the roof with "DANGER ASBESTOS HAZARD" warning ribbon.
2. Prior to starting work on the roof, clear and remove trash from the base of the exterior walls (ground level) extending 15 feet out from the walls. If bushes are present, these shall be covered with
3. Place a drop cloth consisting of one layer of 6-mil polyethylene sheeting at the base of the exterior walls and extend the drop cloth 15 feet out from the walls.
4. Seal rooftop penetrations, skylights, ventilator equipment, and all other openings with two layers of 6-mil polyethylene sheeting.

3.2 WORKER DECONTAMINATION ENCLOSURE SYSTEMS

A. At least one worker decontamination enclosure system shall be provided on the site that is easily accessible from each of the asbestos removal work areas. The asbestos worker decontamination enclosure system may also be used for the lead worker decontamination system.

B. Worker decontamination enclosure systems constructed at the worksite shall utilize 6-mil Opaque black or white polyethylene sheeting or other acceptable materials for privacy.

C. The worker decontamination enclosure system shall consist of at least a clean room, a wash station, and an equipment room, each separated from the other by curtained doorways.

D. Entry to and exit from all decontamination enclosure system chambers shall be through curtained doorways consisting of two sheets of overlapping polyethylene sheeting. One sheet shall be secured at the top and left side, the other sheet at the top and right side. Both sheets shall have weights attached to the bottom to ensure that they hang straight and maintain a seal over the doorway when not in use. Doorway designs, providing equivalent protection and acceptable to the RSCCD, may be utilized.

E. Pathways into (from clean to contaminated) and out of (contaminated to clean) the work area shall be clearly designated.

F. The clean room shall be sized to adequately accommodate the work crew. The clean room shall also provide shelves for storing respirators and a location for posting notices.

G. The wash station shall have water and soap for washing away asbestos contamination. The wash station shall have a drain pan to collect wastewater.

H. The equipment room shall be used to disrobe for washing at the wash station. A drum lined with a labeled 6-mil polyethylene bag for collection of disposable clothing shall be located in this room.

3.3 EMERGENCY EXITS

A. Emergency exits shall be established and clearly marked with duct tape arrows or other effective designations to permit easy identification and location by the workers from anywhere within the work area. Emergency exits shall be secured to prevent access from uncontaminated areas and still permit emergency exiting. Emergency exits shall be properly sealed with 6-mil polyethylene sheeting that can be cut to permit egress, if needed. These exits may be the worker decontamination enclosure, the waste pass-out airlock, and/or other alternative exits satisfactory and in compliance with local fire regulations. Where emergency exits are sealed, an instrument capable of cutting the polyethylene barrier shall be installed on both sides of the barrier, to allow for immediate exit from the work area in the event of an emergency.

3.4 MAINTENANCE OF WORKPLACE BARRIERS

A. Following completion of the construction of polyethylene barriers and decontamination system enclosures, adequate settling time shall be required to ensure that barriers will remain intact and secured to walls and fixtures before beginning actual abatement activities.

B. Workplace barriers shall be visually inspected at the beginning of each work period or shift by the Supervisor/Competent Person.

C. Damage and defects in the enclosure system shall be repaired immediately upon discovery. This information shall also be noted in the Contractor's daily log.

D. At any time during the abatement activities after barriers have been erected, if visible material is observed outside of the work area or if damage occurs to barriers, work shall immediately stop, repairs made to barriers, and debris/residue cleaned up using appropriate HEPA-vacuuming and wet-mopping procedures. This information shall also be noted in the Contractor's daily log.

3.5 COMMENCEMENT OF WORK SHALL NOT OCCUR UNTIL

A. Enclosure systems have been constructed and tested.

B. At least one three-stage decontamination unit with wash station is operational. This decontamination unit can be the same as the lead-related demolition decontamination unit.

C. Pressure differential systems are functioning adequately.

D. Pre-abatement submissions, notifications, and permits have been provided and are satisfactory to the RSCCD's Representative.

E. Equipment for abatement, cleanup, and disposal are available.

F. Worker training, medical examination, and respirator fit testing (and certification) is completed or applicable, current documentation of this information is provided.

G. This information shall also be provided for new workers on the first day they arrive at the work site.

H. Glove bags have been smoke tested.

I. Contractor receives permission from the RSCCD to commence asbestos-related demolition work.

3.6 WORKPLACE ENTRY AND EXIT PROCEDURES

A. General: The following procedures shall be followed prior to entrance into any regulated asbestos work area:

1. Personnel who enter the work area shall sign the entry log upon entry and exit.

2. Personnel, before entering the work area, shall read and be familiar with posted regulations, personal protection requirements (including workplace entry and exit procedures), and emergency procedures.

3. Personnel shall wear appropriate respiratory protection and disposable coveralls, head covering, and foot covering. Hardhats, eye protection, and gloves shall also be utilized, as required. Clean respirator filter cartridges and protective clothing shall be provided and utilized by each person for each separate entry into the work area.

4. Personnel wearing designated personal protective equipment shall proceed to the work area.

5. To exit the work area, personnel shall proceed to the equipment room where they shall remove protective equipment, except respirators, and deposit disposable clothing into appropriately labeled containers for disposal.

6. Clothing or footwear worn into a regulated work area will not be permitted out of the regulated work area.

7. Reusable, contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement, it shall be disposed of as asbestos-contaminated waste. (Rubber boots may be decontaminated at the completion of the abatement for reuse).

B. Roofing Material Removal Work Area and Exit Procedures:

1. Asbestos handlers involved in roofing material removal procedures shall wear two disposable spunbound suits, including gloves, hood and footwear, and appropriate respiratory protective equipment. Hard hats, eye protection, and gloves shall also be utilized as required. Clean respirators and protective clothing shall be provided and utilized by each person for each separate entry into the work area.

2. The double layer personal protective equipment shall be used throughout the procedure if a decontamination unit with a shower room is not contiguous to the work area. Upon exiting the work area and entering the change room, the worker shall HEPA vacuum and wet clean the outer suit and dispose of it as asbestos-contaminated waste. Workers shall then proceed to an operational three-stage decontamination unit to remove and dispose of the second suit, shower, and change into street clothes.

3.7 ASBESTOS-CONTAINING MATERIAL REMOVAL PROCEDURES

A. General

1. Work area shall be cleaned and isolated in accordance with the procedures set forth in Article 3.01 of this Section.

2. Waste containers for floor tile and mastic and roofing material shall be sealed when full. Bags shall not be overfilled. Bags shall be securely sealed to prevent accidental opening and leakage by tying the tops of bags in an overhand knot or by taping in gooseneck fashion. Bags shall not be sealed with wire or cord.

B. Resilient Floor Tile/Mastic Removal Procedures:

1. Asbestos-containing floor tile/mastic shall be sprayed with amended water, or chemical remover using spray equipment capable of providing a low-pressure application. Solvent vapors shall be exhausted in a manner that does not create a fire hazard, health hazard or nuisance, and complies with applicable SCAQMD regulations.

2. Wetted asbestos resilient floor tile/mastic shall be removed using methods to minimize the breakup of the material. The resilient flooring shall not be rendered friable during the removal. Waste materials shall be packed in 6-mil plastic bags as it is removed and placed in labeled containers for transport. Material shall not be allowed to dry out prior to insertion into the container.

3. Mastic shall be removed using solvent and rags. The mastic residue and rags shall be placed into properly labeled waste containers.

4. Cleanup shall proceed in accordance with Article 3.08 -Cleanup Procedures.
5. After the work area surfaces have been rendered free of visible residues, a thin coat of an approved encapsulating agent shall be applied to seal in nonvisible residue.
6. Dispose of all asbestos containing/contaminated waste in accordance with Article 3.10 -Disposal Procedures.

C. Pipe Insulation Removal Procedures:

1. Glove bags shall be installed so that they completely cover the piping and other structures where asbestos work is to be done. Glove bags shall be installed by cutting the sides of the glove bag to fit the size of pipe or opening from which asbestos is to be removed. The glove bag is attached to the pipe by folding the open edges together and securely sealing them with tape. All openings in the glove bag must be sealed with duct tape or equivalent material. The bottom seam of the glove bag must also be sealed with duct tape or equivalent to prevent any leakage from the bag that may result from a defect in the bottom seam.
2. Asbestos-containing pipe insulation shall be thoroughly wet with amended water.
3. Asbestos-containing pipe insulation contained within the glove bag shall be removed manually, utilizing appropriate hand tools.
4. The removed asbestos waste and other structures that have fallen into the enclosed bag must be maintained in a wet state.
5. After removal of the asbestos-containing pipe insulation, the piping and other structures from which the asbestos has been removed must be thoroughly cleaned with a polyethylene brush and wet wiped until no traces of asbestos debris can be seen. Non-asbestos insulation, if present, must be cut back a minimum of three inches from where it comes into contact with any asbestos containing material.
6. When the asbestos removal and encapsulation have been completed, a vacuum hose from a HEPA-filtered vacuum must be inserted into the glove bag through the appropriate port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (as close to the top as possible), twisted, and sealed with dust tape in order to keep the asbestos-containing materials safely in the bottom of the bag. The HEPA vacuum can then be removed from the bag, and the glove bag itself can be removed from the work area to be disposed of properly.
7. After the work area surfaces have been rendered free of visible residues, a thin coat of a satisfactory encapsulating agent shall be applied to seal in nonvisible residue.
8. Cleanup shall proceed in accordance with Article 3.08 -Cleanup Procedures.
9. Dispose of all asbestos containing/contaminated pipe fitting waste as hazardous waste in accordance with Article 3.10 -Disposal Procedures.

D. Sprayed Fireproofing Removal

1. Completely isolate the work area to prevent dust or debris from passing beyond the fully contained envelope. Place the contained work area under negative pressure and provide four complete air changes per hour.
2. Thoroughly wet the fireproofing and debris with amended water.
3. HEPA vacuum and wet wipe all visible debris from the areas below the fireproofing and overspray. Remove fireproofing using appropriate hand tools. Continue to wet material until all visible material is removed.
4. After removal, all surfaces from fireproofing has been removed must be thoroughly cleaned with a polyethylene brush and wet wiped until no traces of asbestos debris can be seen.

5. After all work area surfaces have been rendered free of visible residue, apply a thin coat of encapsulating agent to those surfaces to seal non-visible residue.
6. Cleanup shall proceed in accordance with Section 3,8-cleanup procedures.
7. Dispose of all asbestos containing/contaminated wastes as hazardous waste in accordance with Section 3.10-Disposal Procedures.

3.8 CLEANUP PROCEDURES

A. General

1. Visible accumulations of ACM and asbestos-contaminated debris shall be removed and containerized utilizing nonmetallic tools (squeegees, shovels, and the like). Surfaces in the work area shall then be wet cleaned. Equipment used in the work area shall be included in the cleanup, and shall be removed from work areas via the decontamination enclosure system or waste load-out, at appropriate times in the cleaning sequence.
2. None of the procedures described in this Article relieve the Contractor of the responsibility to meet the final clearance criteria as established by this Section.

B. Resilient Flooring and Mastic Removal Cleanup Procedures:

1. The windows, doors, and HVAC vents shall remain sealed, and any HEPA filtered pressure differential systems, waste load-out, and decontamination enclosure systems shall remain in service.
2. The work area and other contaminated areas shall be cleaned utilizing HEPA filtered vacuum equipment and wet-wiping techniques. After completion of the cleaning operation, a complete visual inspection of the work shall be conducted with the RSCCD to ensure that the work area is free of visible asbestos debris. A final check shall be made for asbestos debris, and further cleaning will be conducted as necessary. The RSCCD shall be notified 24 hours in advance of the requirement for a visual inspection.
3. Upon completion of the cleaning operation, Contractor shall notify the RSCCD that the negative pressure enclosure work areas are ready for review and clearance air monitoring. The negative pressure enclosure areas shall be cleaned until they pass the Clearance Air Monitoring Standard. The RSCCD will require up to one 8-hour shift to complete clearance air monitoring following successful completion of the visual inspection.
4. Upon notification from the RSCCD that the negative pressure enclosure work area have passed the standard for clearance air monitoring, the Contractor shall remove remaining polyethylene sheeting, isolation and/or critical barriers, decontamination unit, dismantle negative air pressure devices, and remove asbestos warning signs/ribbon.

C. Pipe Insulation and Fire-proofing Procedures:

1. All critical barriers shall remain sealed, and any HEPA-filtered pressure differential systems, waste load-out, and decontamination enclosure systems shall remain in service.
2. The work area and other contaminated areas shall be cleaned utilizing HEPA filtered vacuum equipment and wet-wiping techniques. After completion of the cleaning operation, a complete visual inspection of the work shall be conducted with the RSCCD to ensure that the work area is free of visible asbestos debris. A final check shall be made for asbestos debris, and further cleaning will be conducted as necessary. The RSCCD shall be notified 24 hours in advance of the requirement for a visual inspection.

3.9 CLEARANCE AIR MONITORING

A. The following clearance air monitoring procedures will be used in negative pressure enclosure work areas.

1 After completion of cleanup operations, Contractor shall notify the RSCCD that the work areas are ready for clearance air monitoring. Notification shall be a minimum of 24 hours prior to the need for clearance air monitoring. Final clearance air monitoring shall be conducted only after the procedures set forth in Article 3.08 of this Section have been completed, the area has been satisfactorily cleaned and encapsulated, and the abatement area has been thoroughly dried.

2 The RSCCD shall conduct post-abatement clearance testing by collecting and analyzing air samples using Phase Contrast Microscopy using NIOSH Method 7400.

3 Clearance of a work area shall be achieved when each sample indicates airborne fiber concentrations are less than or equal to 0.01 fiber/CC.

4 Abatement areas not achieving clearance shall be recleaned using procedures set forth in Article 3.08 of this Section, and retested until clearance is achieved. The cost of additional samples, consultant air monitoring fees, and labor for recleaning the work areas that fail final air clearances shall be paid for by the Contractor.

3.10 DISPOSAL PROCEDURES

A. As the work progresses, to prevent exceeding available storage capacity on site, sealed and labeled containers of asbestos-containing waste shall be removed and transported to the prearranged disposal location.

B. Unless other arrangements are made satisfactory to the RSCCD, bagged or wrapped material shall be removed from the work areas and placed in a Contractor-supplied dumpster a minimum of every day. The dumpster shall be marked with asbestos warning signs and be locked at all times when not in use. When a dumpster is full, it shall be removed from RSCCD property by the end of the next business day.

C. Disposal shall occur at an authorized site, in accordance with regulatory requirements of NESHAPs and applicable state and local guidelines and regulations, including the California State Department of Health Services, Toxic Substances Control Division.

D. Uniform hazardous waste manifests, non-hazardous waste date forms, dump receipts; trip tickets, transportation manifests, or other documentation of disposal shall be delivered to the RSCCD Representative for their records.

3.11 OSHA PERSONNEL AIR MONITORING

A. Air monitoring required by OSHA for asbestos exposure determination is work of the contractor. The contractor is responsible for providing daily OSHA compliance monitoring as per 8 CCR 1529 and 29 CFR 1926.1101.

1. At minimum, Contractor shall conduct representative (25% of crew) breathing zone personal air monitoring of its employees twice each shift and repeated daily.

2. Monitoring shall be conducted by a qualified air professional experienced and knowledgeable about the methods of air monitoring and in accordance with 8 CCR 1529 and CFR 1926.1101.

3. Monitoring results and appropriate laboratory analysis work shall be submitted to the RSCCD within twenty-four (24) hours of the monitoring work.

3.12 ALTERNATE PROCEDURES

A. The procedures described in this Section shall be utilized at all times.

B. If specified procedures cannot be utilized, a request shall be made in writing to the RSCCD providing

details of the problem encountered and proposed alternatives.

C. Alternative procedures shall provide equivalent or greater protection than the procedures that they replace.

D. Alternative procedure shall be approved in writing by the RSCCD prior to implementation.

END OF SECTION 02 26 23

SECTION 022626

STABILIZATION / REMOVAL OF LEAD CONTAINING COMPONENTS

A. INTRODUCTION:

These specifications have been designed in favor of Rancho Santiago Community College District for the removal or management of all surfaces containing lead or lead based paint that will be impacted during the demolition of Building U at the Santa Ana College Campus. These specifications shall apply to all areas constructed before January 1, 1993. According to Title 17, Code of Regulations, Division 1, Chapter 8, §35043, all painted surfaces that have not been tested by a State Certified Lead Inspector I Assessor are presumed lead-based paint.

B. SCOPE OF WORK:

1. The preparation of work under this contract covers materials that contain lead and/or lead based paint, including but not limited to wall sinks, floor sinks and ceramic tile walls.

2. The Contractor shall provide all labor, materials, equipment, services, testing, supervision and incidentals necessary to perform work of lead paint abatement/stabilization under this contract in accordance with the following specifications. After preparation, the areas disturbed shall be cleaned and tested in accordance with the procedures outlined below.

3. All surfaces that are only prepped and not abated during site preparation shall be primed or encapsulated using any latex paint or primer on each type of surface or substrate that has been disturbed (wood, metal, stucco etc) prior to demolition. All components that tested positive for the presence of lead at or above the HUD action level and any similar untested components should be considered lead-laden. Any work activities on these components must be performed in an abatement/containment environment as required by Cal/OSHA Construction and Safety Orders, Lead Section *1532.1*. Any component that is below the HUD action level but still contains lead requires personal exposure level (PEL) testing be performed to determine the workers skill or certification required to perform the activity if an outside contractor will do the work.

4. Refer to lead based paint inspection reports to determine whether lead based paint is present at penetration or attachment locations.

Building U Abatement

Exterior	None of the components tested positive for the presence of lead based paint
Interior First Floor Room 104-2	Remove 1 floor sink
Room 120-6	Remove 1 water basin
Room 120-4 RR	Remove 1 water basin
Room 128 Custodian	Remove 1 water basin
Room 128 Custodian	Remove approximately 350 square feet of ceramic tile walls
Room 129 Men's RR	Remove approximately 350 square feet of ceramic tile walls
Room 130 Women's RR	Remove approximately 350 square feet of ceramic tile walls
2nd Floor Custodian (off hall)	Remove 1 floor sink
Room 206 Men's RR	Remove 1 water basin

Kitchen Storage	Remove 1 floor sink
Room 208 RR	Remove 1 water basin
Room 216	Remove ceramic tile wall at drinking fountain
Room 224 Custodian	Remove water basin Room 224 Custodian
Room 225 Men's RR	Remove approximately 441 square feet of tile wall
Room 226 Women's RR	Remove approximately 441 square feet of tile wall

C. GENERAL REQUIREMENTS:

1. All workers who perform the lead paint abatement and *I* or stabilization (including clean up) described herein shall be State Certified Workers with current State issued "certificates" and have prior training in lead abatement as required by Title 17, CCR, Division 1 Chapter 8, §35009 & §35001 as well as other required training including safe and proper use of equipment.

2. Contractor is to have a State Certified Lead Supervisor with a current State issued "certificate" referenced above by Title 17 CCR, as part of his staff during the lead paint abatement/stabilization. The State Certified Lead Supervisor will be designated the "competent person". A "competent person" is a DPH "certified supervisor" who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions who has authorization to take prompt corrective measures to eliminate them.

3. A minimum of one RRP certified worker shall be on job site at all times. The RRP certified worker is responsible to train the other DPH Certified Workers, worker lead safe practices as taught in the RRP class.

4. Prior to commencement of lead abatement activities, the contractor is to provide AAA Lead Consultants and Inspections, Inc. with copies of current lead in blood, medical release to use respirator, respirator fit test and proof of DPH certification for each worker.

5. AAA LEAD Consultants and Inspections, Inc. will perform Project Monitoring and final clearance testing for this project as requested by Rancho Santiago College District.

6. Contractor must provide proof of delivery of DPH form 8551 to DPH (Department of Health Services) five days prior to commencement of abatement activities as required by Title 17, CCR, Div 1, Chapter 8.

7. Contractor must provide proof of delivery of Cal/OSHA notification of lead related work as required as of January 25, 2002 in Title 8, Construction Safety Orders, Chapter 4, Subchapter 4, Article 4, Section 1532.1.

8. Contractor must notify AAA Lead Consultants and Inspections, Inc. of the intent to perform lead abatement activities a minimum of 48 hours prior to the commencement of work. Lead related activities may not commence without written authorization of the building owner / owner representative.

D. RECORDS:

1. The contractor shall provide a copy of his current California Department of Health Services "Supervisor Certificate" or California Department of Health Services photo identification card prior to commencement of work.

2. The contractor or "supervisor" shall provide before the commencement of any work, copies of all "certified workers" current documentation including, "worker certificate", lead in blood test results within last six months, Dr.'s statement for each workers ability to wear NIOSH approved respirator and a respirator fit test.

3. The contractor shall provide the location and description of all presumed lead based paint locations and substances that are abated through removal, paint film stabilization or encapsulation.

4. The contractor shall provide starting and completion dates of the prep and/or abatement work.

5. The contractor shall submit a detail summary of the techniques used to comply with these regulations.

6. The contractor shall mark on as-built drawings a note in bold letters that all surfaces with lead paint have been encapsulated, stabilized or removed under this contract, describing such locations and method used.

7. The contractor shall submit to Rancho Santiago College District copies of all records that the abatement and site preparation has been performed in compliance with the lead paint abatement procedures.

E. WORK AREA PREPARATION:

1. Decontamination Units:

One decontamination unit will be required at each lead control area.

a) Cover the floor where the decontamination unit will be placed with 2-layers of 6-mil polyethylene (poly) prior to setting up of unit.

b) Provide single entry and exit to each work area.

c) Provide a 1-stage decontamination unit with a wash station. This area must be constructed of 6-mil "poly" sheeting and PVC piping at a minimum.

2. Lead Control Area Isolation Procedures:

a) Post signs and barrier tape in compliance with Cal/OSHA, Title 8, CCR Section 1532.1. Barrier tape shall be at a minimum of 25 feet around all lead abatement areas. Contractor shall insure that the signs required are at least 20" by 14" and states the date and place of the lead abatement project. The sign must include the phrase "CAUTION LEAD HAZARD. KEEP OUT" in bold lettering at least 2 inches high. Signs to be in English or Spanish.

b) Install suitable ground protection to prevent rupturing of plastic sheeting by ladders, scaffolding, nails, falling debris, etc. Install a minimum of two layers of 6-mil poly sheeting to base of building with duct tape or other anchoring system so that no gaps exist between the base of the building and the plastic sheeting. Poly sheeting is to extend a minimum of 10 feet from the farthest exterior portion of the area or building being disturbed. Seal overlapping sections of plastic with duct tape to provide a leak proof surface. Weight the ends of plastic sheeting to prevent blowing from the wind and breezes. All edges of the plastic sheeting shall be elevated to create a trough and prevent runoff of excess water and debris. Cover all plants and shrubs within 15 feet of the perimeter of the building with one layer plastic sheeting.

c) In the event of rain, all work on the exterior of any structure shall be suspended or shall not begin until such time that weather conditions change more favorably.

d) In the event of strong winds that create a condition whereby containment of airborne lead dust and or debris become infeasible, work shall be suspended or shall not begin on the exterior of the structure until notified by project monitor.

e) The decision to suspend work due to wind or rain will be made by the project monitor or a Rancho Santiago College District representative.

F. METHODS OF ABATEMENT/STABILIZATION:

1. Removal of wall and floor tiles is to be performed by striking with hammers and chisels or mechanical means (jack hammers / chipping hammers).

2. Floor sinks and water basins shall be unbolted and removed after all plumbing connections have been severed.

G. PERSONAL PROTECTION**:**

1. The contractor shall insure that its employees are protected in accordance with all applicable Federal, State and Local standards, in particular, those set forth in the OSHA regulations governing occupational health and environmental controls in Subpart D of Title 29 CFR (Code of Federal Regulations) Section 1926.62 containing employee protection requirements for construction workers exposed to lead.

2. All lead paint abatement workers shall have received lead paint medical screening and will have been physician certified to work while wearing a respirator along with all other regulations as required by CCR, (California Code of Regulations) Title 8, Section 1532.1.

3. All persons when, present at the work site, shall wear disposable protective suits with attached hoods and shoe coverings designed for lead abatement. All personnel entering the lead control area shall wear rubber or latex gloves beneath their work gloves. Gloves are to be taped to the suit sleeves with duct tape.

4. Contractor shall provide gloves, eye protection, disposable protective suits and other recommended safety equipment for use by all workers.

5. All persons entering the work area are to wear a minimum of a half faced air-purifying respirator equipped with HEPA cartridges for protection from airborne lead particles.

6. Personal sampling is to be done using an air sampling pump to determine overall exposure in each work area and to monitor PEL (permissible exposure limits) for workers.

7. A separate decontamination area as noted in SECTION§1, is to be located adjacent to the work area. All personnel will complete decontamination upon exit of the work areas in the decontamination area. Decontamination area shall contain a minimum of a HEPA vacuum, wash station (soapy water and rinse water or pre-moistened towellets) and dressing area. All disposable clothing, wash supplies and discarded equipment is to be placed directly into 6 mil plastic bags and then stored in locked 55-gallon metal drums as per specifications under Clean Up of Work Area.

H. WORKER SAFETY:

1. Ladders:

   a) Refrain from using ladders with broken, missing or defective parts.
   b) Ladder feet must be on substantial base.
   c) Top and bottom of ladder must be kept clear.
   d) No job made ladders.
   e) No metal ladders shall be used on project.
   f) Ladders shall not be used in a horizontal position.
   g) Always face ladder.
   h) Do not step higher than third rung on straight ladder and second step on stepladder.
   i) Always inspect ladder before use.
   j) Do not attempt to move ladder while in use. Worker must fully egress ladder before moving ladder to a different location.

2. Scaffolding:

    a) All scaffolding shall utilize guardrails, mid rails and toe boards.
    b) No persons shall be permitted to remain on scaffold while it is being moved or rolled.
    c) Lock scaffold wheels when location is achieved. d) Scaffold height shall not exceed four times the base dimension.
    e) Use scaffold grade lumber for planking.
    f) Use scaffold capable of supporting at least four times the intended load.
    g) Climbing of any scaffold braces or supports not specifically designed for access is prohibited.

3. Personal Protective Equipment:

    a) Follow guidelines as stated above in Section G, paragraphs 1 through 7.

4. Training, Fit Testing and Medical Surveillance:

    a) Current Medical Surveillance Records for all employees required to enter the contaminated area. All workers on this project must have baseline and post abatement blood lead level and zinc protoporphyrin (zzp) measurements made before and after the work of the contract begins and ends respectively.

5. Housekeeping:

    a) Throughout the abatement process the work areas will be kept free from a buildup of removed components or paint chip debris. On an ongoing basis, all components shall be wrapped or placed in two layers of 6-mil plastic sheeting or bags. Loose paint chip dust and debris shall be collected with HEPA vacuums and / or wet wiping and placed in six mil plastic bags and sealed with duct tape.

I. CONTROL OF ACCESS:

1. Each work area to be secured with barrier warning tape at least 25 feet from the work location and posted as a lead abatement project and potential hazard site.

2. A person may not enter the work area unless that person is authorized to do so by the "competent person" or project monitor.

3. Contractor to post caution signs and barrier tape in each work area containing lead based paint before removing or encapsulating lead paint.

4. Contractor shall keep the signs posted and barrier tape intact during abatement and clean up as described in this specification.

5. Contractor shall insure that the signs required are at least 20-inches by 14-inches and states the date and place of the lead abatement project. The sign must include the phrase "CAUTION LEAD HAZARD, KEEP OUT" in bold lettering at least 2 inches high along with DO NOT ENTER WORK AREA, AUTHORIZED PERSONNEL ONLY, NO EATING, DRINKING, OR SMOKING IN THIS AREA in at least 1 inch high lettering. The signs are to be in English and Spanish.

J. CLEAN UP OF WORK AREA:

1. Preliminary clean up shall be performed by certified-trained workers as follows:

a) After the abatement / preparation work has been completed, or at the end of the work day, remove all debris and provide the interim clean-up as described below:

b) Deposit all lead waste, including sealing tape, plastic sheeting, mop heads, sponges, filters and disposable clothing etc. in double plastic bags, of at least 6 mils thick. Bags are then to be deposited and stored in locked 55 gallon metal drums labeled "DANGER LEAD HAZARD" and secured on site.

c) Vacuum clean all surfaces in the work area including woodwork, metal work, walls, windows, window wells, polyethylene, steps etc. with a HEPA vacuum.

d) After vacuum cleaning, using phosphate free or detergent wash all polyethylene coverings that are to be reused in the work area with at least 1-ounce of 5 percent phosphate free solution (or similar lead removal product) to each gallon of water.

e) After polyethylene washing has dried, vacuum clean polyethylene, with a HEPA vacuum until no visible residue remains.

f) Final clean up to be performed prior to wipe testing when abatement I preparation work is finished.

K. FINAL CLEANUP:

1. Procedures:

a) After removal of all plastic sheeting, except critical barriers, final cleaning can proceed. Begin with a thorough HEPA vacuuming of all surfaces starting at the ceilings, proceeding down the walls to the floor. The floors shall be vacuumed by starting from the farthest corners of the entrance of the work areas. HEPA vacuuming is to be performed as described in the previous section before and after detergent wash as shown below.

b) Wet wipe and mop the same surfaces with a 5% solution of Phosphate free Lead cleansing detergent and allow the surfaces to dry.

c) Thoroughly HEPA vacuum and wet wipe tools and other equipment before removing from work area. Any power tools that cannot be completely de-contaminated shall be placed in pre-labeled plastic bags and sealed with duct tape before removing from work area.

d) Hand tools such as, scrappers, broad knives, etc., shall be cleaned by wet wiping prior to removal from the work area.

e) All personnel will follow strict decontamination procedures, including use of soap and shower facilities to wash hands, face and body as well as respirators before exiting shower.

L. WASTE DISPOSAL:

1. The contractor shall be responsible for determining whether any of the waste materials are hazardous waste. This includes not only solid waste, but also wastewater generated from interim and final clean up. All test results are to be submitted to AAA Lead Consultants and Inspections, Inc. or a representative of the

Rancho Santiago College District prior to the disposal of lead containing debris.

2. The contractor shall remove, within 10 days, all lead waste materials from the site after final completion of lead abatement and preparation in compliance with applicable waste requirements.

3. The contractor shall transport and dispose of lead waste in a legal manner as described in 22CCR, chapter 12 (beginning with section 66262.10).

4. All lead containing components removed for disposal shall be burrito wrapped in six mil plastic or double bagged in six-mil plastic bags and sealed with duct tape prior to being placed in roll off container.

M. TESTING:

1. Prior to commencement of site abatement and preparation Project Monitor will take baseline samples to establish existing lead dust levels.

2. At time of final clearance, the Project Monitor shall conduct wipe tests at and around abatement and preparation work areas.

3. The Project Monitor shall submit the test results to Rancho Santiago College District and the Contractor indicating that lead dust levels are at or below baseline levels.

4. If wipe test exceeds baseline levels, contractor is to reclean areas using the above criteria and new wipe tests shall be taken until at which time the test do pass. Cost associated with retesting will be billed to the l district and deducted from abatement contractor at $125 per return visit and $50 per sample retaken.

N. PEL MONITORING:

1. Personal air monitoring shall be performed at one or more sites to determine the PEL and worker qualifications for performing similar tasks at each location.

2. Employees involved in personal exposure monitoring to determine worker protection and certification requirements will be required to have:

   A) Recent medical release to wear a respirator.
   B) Biological Testing (blood draw within last 6 months)
   C) Recent respirator fit test.
   D) Dress out in protective clothing including gloves, shoe covers, eye protection, head cover and hepa equipped respirator as outlined in Section G.

3. Worker is to wear a personal air-monitoring pump equipped with a 37mm cassette for testing lead content in air. The air flow rate is to be set between 2 and 4 liters of air per minute and be worn for eight hours while performing abatement / remediation tasks.

4. Air sample(s) to be collected by Project Monitor and sent to state accredited laboratory for analysis.

O. SUBMITTALS:

1. The Contractor shall inform AAA Lead Consultants and Inspections or a representative of the Rancho Santiago College District of where all waste materials are disposed of by State Certified hauler and provide AAA Lead Consultants and Inspections with the EPA number and a copy of the transportation manifest

2. Certificates of training, for all abatement and clean-up personnel who will be performing the work under this contract, must be submitted to AAA Lead Consultants and Inspections, Inc., or a Rancho Santiago College District representative two days prior to commencement of abatement activities.

3. Contractor to provide proof of lead paint medical screening for lead in blood on all workers prior to commencement of abatement activities and again within 7 days of completion of all abatement projects.

4. Contractor to provide medical release for use of respirator for all workers prior to commencement of abatement activities.

5. Contractor to provide respirator fit test documentation prior to commencement of abatement activities.

6. Final payment to abatement contractor shall be held until all submittals have been made to AAA Lead Consultants and Inspections or Rancho Santiago College District.

P. SITE SPECIFIC LEAD LOCATIONS:

1. Not every component on the building was tested, therefore any similar component to those identified as lead containing are to be assumed to also contain lead based paint unless otherwise noted. All lead laden components must be worked on in an abatement / containment environment.

END OF SECTION 022626

SECTION 022626

STABILIZATION / REMOVAL OF LEAD CONTAINING COMPONENTS

A. INTRODUCTION:

These specifications have been designed in favor of Rancho Santiago Community College District for the removal or management of all surfaces containing lead or lead based paint that will be impacted during the demolition of Building U at the Santa Ana College Campus. These specifications shall apply to all areas constructed before January 1, 1993. According to Title 17, Code of Regulations, Division 1, Chapter 8, §35043, all painted surfaces that have not been tested by a State Certified Lead Inspector I Assessor are presumed lead-based paint.

B. SCOPE OF WORK:

1. The preparation of work under this contract covers materials that contain lead and/or lead based paint, including but not limited to wall sinks, floor sinks and ceramic tile walls.

2. The Contractor shall provide all labor, materials, equipment, services, testing, supervision and incidentals necessary to perform work of lead paint abatement/stabilization under this contract in accordance with the following specifications. After preparation, the areas disturbed shall be cleaned and tested in accordance with the procedures outlined below.

3. All surfaces that are only prepped and not abated during site preparation shall be primed or encapsulated using any latex paint or primer on each type of surface or substrate that has been disturbed (wood, metal, stucco etc) prior to demolition. All components that tested positive for the presence of lead at or above the HUD action level and any similar untested components should be considered lead-laden. Any work activities on these components must be performed in an abatement/containment environment as required by Cal/OSHA Construction and Safety Orders, Lead Section *1532.1*. Any component that is below the HUD action level but still contains lead requires personal exposure level (PEL) testing be performed to determine the workers skill or certification required to perform the activity if an outside contractor will do the work.

4. Refer to lead based paint inspection reports to determine whether lead based paint is present at penetration or attachment locations.

Building U Abatement

Exterior	None of the components tested positive for the presence of lead based paint
Interior First Floor Room 104-2	Remove 1 floor sink
Room 120-6	Remove 1 water basin
Room 120-4 RR	Remove 1 water basin
Room 128 Custodian	Remove 1 water basin
Room 128 Custodian	Remove approximately 350 square feet of ceramic tile walls
Room 129 Men's RR	Remove approximately 350 square feet of ceramic tile walls
Room 130 Women's RR	Remove approximately 350 square feet of ceramic tile walls
2nd Floor Custodian (off hall)	Remove 1 floor sink
Room 206 Men's RR	Remove 1 water basin

Kitchen Storage	Remove 1 floor sink
Room 208 RR	Remove 1 water basin
Room 216	Remove ceramic tile wall at drinking fountain
Room 224 Custodian	Remove water basin Room 224 Custodian
Room 225 Men's RR	Remove approximately 441 square feet of tile wall
Room 226 Women's RR	Remove approximately 441 square feet of tile wall

C. GENERAL REQUIREMENTS:

1. All workers who perform the lead paint abatement and *I* or stabilization (including clean up) described herein shall be State Certified Workers with current State issued "certificates" and have prior training in lead abatement as required by Title 17, CCR, Division 1 Chapter 8, §35009 & §35001 as well as other required training including safe and proper use of equipment.

2. Contractor is to have a State Certified Lead Supervisor with a current State issued "certificate" referenced above by Title 17 CCR, as part of his staff during the lead paint abatement/stabilization. The State Certified Lead Supervisor will be designated the "competent person". A "competent person" is a DPH "certified supervisor" who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions who has authorization to take prompt corrective measures to eliminate them.

3. A minimum of one RRP certified worker shall be on job site at all times. The RRP certified worker is responsible to train the other DPH Certified Workers, worker lead safe practices as taught in the RRP class.

4. Prior to commencement of lead abatement activities, the contractor is to provide AAA Lead Consultants and Inspections, Inc. with copies of current lead in blood, medical release to use respirator, respirator fit test and proof of DPH certification for each worker.

5. AAA LEAD Consultants and Inspections, Inc. will perform Project Monitoring and final clearance testing for this project as requested by Rancho Santiago College District.

6. Contractor must provide proof of delivery of DPH form 8551 to DPH (Department of Health Services) five days prior to commencement of abatement activities as required by Title 17, CCR, Div 1, Chapter 8.

7. Contractor must provide proof of delivery of Cal/OSHA notification of lead related work as required as of January 25, 2002 in Title 8, Construction Safety Orders, Chapter 4, Subchapter 4, Article 4, Section 1532.1.

8. Contractor must notify AAA Lead Consultants and Inspections, Inc. of the intent to perform lead abatement activities a minimum of 48 hours prior to the commencement of work. Lead related activities may not commence without written authorization of the building owner / owner representative.

D. RECORDS:

1. The contractor shall provide a copy of his current California Department of Health Services "Supervisor Certificate" or California Department of Health Services photo identification card prior to commencement of work.

2. The contractor or "supervisor" shall provide before the commencement of any work, copies of all "certified workers" current documentation including, "worker certificate", lead in blood test results within last six months, Dr.'s statement for each workers ability to wear NIOSH approved respirator and a respirator fit test.

3. The contractor shall provide the location and description of all presumed lead based paint locations and substances that are abated through removal, paint film stabilization or encapsulation.

4. The contractor shall provide starting and completion dates of the prep and/or abatement work.

5. The contractor shall submit a detail summary of the techniques used to comply with these regulations.

6. The contractor shall mark on as-built drawings a note in bold letters that all surfaces with lead paint have been encapsulated, stabilized or removed under this contract, describing such locations and method used.

7. The contractor shall submit to Rancho Santiago College District copies of all records that the abatement and site preparation has been performed in compliance with the lead paint abatement procedures.

E. WORK AREA PREPARATION:

1. Decontamination Units:

One decontamination unit will be required at each lead control area.

a) Cover the floor where the decontamination unit will be placed with 2-layers of 6-mil polyethylene (poly) prior to setting up of unit.

b) Provide single entry and exit to each work area.

c) Provide a 1-stage decontamination unit with a wash station. This area must be constructed of 6-mil "poly" sheeting and PVC piping at a minimum.

2. Lead Control Area Isolation Procedures:

a) Post signs and barrier tape in compliance with Cal/OSHA, Title 8, CCR Section 1532.1. Barrier tape shall be at a minimum of 25 feet around all lead abatement areas. Contractor shall insure that the signs required are at least 20" by 14" and states the date and place of the lead abatement project. The sign must include the phrase "CAUTION LEAD HAZARD. KEEP OUT" in bold lettering at least 2 inches high. Signs to be in English or Spanish.

b) Install suitable ground protection to prevent rupturing of plastic sheeting by ladders, scaffolding, nails, falling debris, etc. Install a minimum of two layers of 6-mil poly sheeting to base of building with duct tape or other anchoring system so that no gaps exist between the base of the building and the plastic sheeting. Poly sheeting is to extend a minimum of 10 feet from the farthest exterior portion of the area or building being disturbed. Seal overlapping sections of plastic with duct tape to provide a leak proof surface. Weight the ends of plastic sheeting to prevent blowing from the wind and breezes. All edges of the plastic sheeting shall be elevated to create a trough and prevent runoff of excess water and debris. Cover all plants and shrubs within 15 feet of the perimeter of the building with one layer plastic sheeting.

c) In the event of rain, all work on the exterior of any structure shall be suspended or shall not begin until such time that weather conditions change more favorably.

d) In the event of strong winds that create a condition whereby containment of airborne lead dust and or debris become infeasible, work shall be suspended or shall not begin on the exterior of the structure until notified by project monitor.

e) The decision to suspend work due to wind or rain will be made by the project monitor or a Rancho Santiago College District representative.

F. METHODS OF ABATEMENT/STABILIZATION:

1. Removal of wall and floor tiles is to be performed by striking with hammers and chisels or mechanical means (jack hammers / chipping hammers).

2. Floor sinks and water basins shall be unbolted and removed after all plumbing connections have been severed.

G. PERSONAL PROTECTION**:**

1. The contractor shall insure that its employees are protected in accordance with all applicable Federal, State and Local standards, in particular, those set forth in the OSHA regulations governing occupational health and environmental controls in Subpart D of Title 29 CFR (Code of Federal Regulations) Section 1926.62 containing employee protection requirements for construction workers exposed to lead.

2. All lead paint abatement workers shall have received lead paint medical screening and will have been physician certified to work while wearing a respirator along with all other regulations as required by CCR, (California Code of Regulations) Title 8, Section 1532.1.

3. All persons when, present at the work site, shall wear disposable protective suits with attached hoods and shoe coverings designed for lead abatement. All personnel entering the lead control area shall wear rubber or latex gloves beneath their work gloves. Gloves are to be taped to the suit sleeves with duct tape.

4. Contractor shall provide gloves, eye protection, disposable protective suits and other recommended safety equipment for use by all workers.

5. All persons entering the work area are to wear a minimum of a half faced air-purifying respirator equipped with HEPA cartridges for protection from airborne lead particles.

6. Personal sampling is to be done using an air sampling pump to determine overall exposure in each work area and to monitor PEL (permissible exposure limits) for workers.

7. A separate decontamination area as noted in SECTION§1, is to be located adjacent to the work area. All personnel will complete decontamination upon exit of the work areas in the decontamination area. Decontamination area shall contain a minimum of a HEPA vacuum, wash station (soapy water and rinse water or pre-moistened towellets) and dressing area. All disposable clothing, wash supplies and discarded equipment is to be placed directly into 6 mil plastic bags and then stored in locked 55-gallon metal drums as per specifications under Clean Up of Work Area.

H. WORKER SAFETY:

1. Ladders:

   a) Refrain from using ladders with broken, missing or defective parts.
   b) Ladder feet must be on substantial base.
   c) Top and bottom of ladder must be kept clear.
   d) No job made ladders.
   e) No metal ladders shall be used on project.
   f) Ladders shall not be used in a horizontal position.
   g) Always face ladder.
   h) Do not step higher than third rung on straight ladder and second step on stepladder.
   i) Always inspect ladder before use.
   j) Do not attempt to move ladder while in use. Worker must fully egress ladder before moving ladder to a different location.

2. Scaffolding:

   a) All scaffolding shall utilize guardrails, mid rails and toe boards.
   b) No persons shall be permitted to remain on scaffold while it is being moved or rolled.
   c) Lock scaffold wheels when location is achieved. d) Scaffold height shall not exceed four times the base dimension.
   e) Use scaffold grade lumber for planking.
   f) Use scaffold capable of supporting at least four times the intended load.
   g) Climbing of any scaffold braces or supports not specifically designed for access is prohibited.

3. Personal Protective Equipment:

   a) Follow guidelines as stated above in Section G, paragraphs 1 through 7.

4. Training, Fit Testing and Medical Surveillance:

   a) Current Medical Surveillance Records for all employees required to enter the contaminated area. All workers on this project must have baseline and post abatement blood lead level and zinc protoporphyrin (zzp) measurements made before and after the work of the contract begins and ends respectively.

5. Housekeeping:

   a) Throughout the abatement process the work areas will be kept free from a buildup of removed components or paint chip debris. On an ongoing basis, all components shall be wrapped or placed in two layers of 6-mil plastic sheeting or bags. Loose paint chip dust and debris shall be collected with HEPA vacuums and / or wet wiping and placed in six mil plastic bags and sealed with duct tape.

I. CONTROL OF ACCESS:

1. Each work area to be secured with barrier warning tape at least 25 feet from the work location and posted as a lead abatement project and potential hazard site.

2. A person may not enter the work area unless that person is authorized to do so by the "competent person" or project monitor.

3. Contractor to post caution signs and barrier tape in each work area containing lead based paint before removing or encapsulating lead paint.

4. Contractor shall keep the signs posted and barrier tape intact during abatement and clean up as described in this specification.

5. Contractor shall insure that the signs required are at least 20-inches by 14-inches and states the date and place of the lead abatement project. The sign must include the phrase "CAUTION LEAD HAZARD, KEEP OUT" in bold lettering at least 2 inches high along with DO NOT ENTER WORK AREA, AUTHORIZED PERSONNEL ONLY, NO EATING, DRINKING, OR SMOKING IN THIS AREA in at least 1 inch high lettering. The signs are to be in English and Spanish.

J. CLEAN UP OF WORK AREA:

1. Preliminary clean up shall be performed by certified-trained workers as follows:

a) After the abatement / preparation work has been completed, or at the end of the work day, remove all debris and provide the interim clean-up as described below:

b) Deposit all lead waste, including sealing tape, plastic sheeting, mop heads, sponges, filters and disposable clothing etc. in double plastic bags, of at least 6 mils thick. Bags are then to be deposited and stored in locked 55 gallon metal drums labeled "DANGER LEAD HAZARD" and secured on site.

c) Vacuum clean all surfaces in the work area including woodwork, metal work, walls, windows, window wells, polyethylene, steps etc. with a HEPA vacuum.

d) After vacuum cleaning, using phosphate free or detergent wash all polyethylene coverings that are to be reused in the work area with at least 1-ounce of 5 percent phosphate free solution (or similar lead removal product) to each gallon of water.

e) After polyethylene washing has dried, vacuum clean polyethylene, with a HEPA vacuum until no visible residue remains.

f) Final clean up to be performed prior to wipe testing when abatement I preparation work is finished.

K. FINAL CLEANUP:

1. Procedures:

a) After removal of all plastic sheeting, except critical barriers, final cleaning can proceed. Begin with a thorough HEPA vacuuming of all surfaces starting at the ceilings, proceeding down the walls to the floor. The floors shall be vacuumed by starting from the farthest corners of the entrance of the work areas. HEPA vacuuming is to be performed as described in the previous section before and after detergent wash as shown below.

b) Wet wipe and mop the same surfaces with a 5% solution of Phosphate free Lead cleansing detergent and allow the surfaces to dry.

c) Thoroughly HEPA vacuum and wet wipe tools and other equipment before removing from work area. Any power tools that cannot be completely de-contaminated shall be placed in pre-labeled plastic bags and sealed with duct tape before removing from work area.

d) Hand tools such as, scrappers, broad knives, etc., shall be cleaned by wet wiping prior to removal from the work area.

e) All personnel will follow strict decontamination procedures, including use of soap and shower facilities to wash hands, face and body as well as respirators before exiting shower.

L. WASTE DISPOSAL:

1. The contractor shall be responsible for determining whether any of the waste materials are hazardous waste. This includes not only solid waste, but also wastewater generated from interim and final clean up. All test results are to be submitted to AAA Lead Consultants and Inspections, Inc. or a representative of the

Rancho Santiago College District prior to the disposal of lead containing debris.

2. The contractor shall remove, within 10 days, all lead waste materials from the site after final completion of lead abatement and preparation in compliance with applicable waste requirements.

3. The contractor shall transport and dispose of lead waste in a legal manner as described in 22CCR, chapter 12 (beginning with section 66262.10).

4. All lead containing components removed for disposal shall be burrito wrapped in six mil plastic or double bagged in six-mil plastic bags and sealed with duct tape prior to being placed in roll off container.

M. TESTING:

1. Prior to commencement of site abatement and preparation Project Monitor will take baseline samples to establish existing lead dust levels.

2. At time of final clearance, the Project Monitor shall conduct wipe tests at and around abatement and preparation work areas.

3. The Project Monitor shall submit the test results to Rancho Santiago College District and the Contractor indicating that lead dust levels are at or below baseline levels.

4. If wipe test exceeds baseline levels, contractor is to reclean areas using the above criteria and new wipe tests shall be taken until at which time the test do pass. Cost associated with retesting will be billed to the l district and deducted from abatement contractor at $125 per return visit and $50 per sample retaken.

N. PEL MONITORING:

1. Personal air monitoring shall be performed at one or more sites to determine the PEL and worker qualifications for performing similar tasks at each location.

2. Employees involved in personal exposure monitoring to determine worker protection and certification requirements will be required to have:

   A) Recent medical release to wear a respirator.
   B) Biological Testing (blood draw within last 6 months)
   C) Recent respirator fit test.
   D) Dress out in protective clothing including gloves, shoe covers, eye protection, head cover and hepa equipped respirator as outlined in Section G.

3. Worker is to wear a personal air-monitoring pump equipped with a 37mm cassette for testing lead content in air. The air flow rate is to be set between 2 and 4 liters of air per minute and be worn for eight hours while performing abatement / remediation tasks.

4. Air sample(s) to be collected by Project Monitor and sent to state accredited laboratory for analysis.

O. SUBMITTALS:

1. The Contractor shall inform AAA Lead Consultants and Inspections or a representative of the Rancho Santiago College District of where all waste materials are disposed of by State Certified hauler and provide AAA Lead Consultants and Inspections with the EPA number and a copy of the transportation manifest

2. Certificates of training, for all abatement and clean-up personnel who will be performing the work under this contract, must be submitted to AAA Lead Consultants and Inspections, Inc., or a Rancho Santiago College District representative two days prior to commencement of abatement activities.

3. Contractor to provide proof of lead paint medical screening for lead in blood on all workers prior to commencement of abatement activities and again within 7 days of completion of all abatement projects.

4. Contractor to provide medical release for use of respirator for all workers prior to commencement of abatement activities.

5. Contractor to provide respirator fit test documentation prior to commencement of abatement activities.

6. Final payment to abatement contractor shall be held until all submittals have been made to AAA Lead Consultants and Inspections or Rancho Santiago College District.

P. SITE SPECIFIC LEAD LOCATIONS:

1. Not every component on the building was tested, therefore any similar component to those identified as lead containing are to be assumed to also contain lead based paint unless otherwise noted. All lead laden components must be worked on in an abatement / containment environment.

END OF SECTION 022626

SECTION 024000

DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Removing above-grade site improvements within limits indicated.

B. Disconnecting, capping or sealing, and abandoning site utilities in place.

C. Disconnecting, capping or sealing, and removing site utilities.

D. Disposing of objectionable material.

E. Protecting in Place existing low voltage underground lines and above ground vault.

1.2 RELATED SECTIONS

A. Section 31100 – Site Preparation.

1.3 DEFINITIONS

A. ANSI: American National Standards Institute.

B. CAL-OSHA: California Occupational Safety and Health Administration.

1.4 SUBMITTALS

A. Follow Submittal procedure outlined in Section 01 33 00 – Submittal Procedures.

1.5 PROJECT CONDITIONS

A. Except for materials indicated to be stockpiled or to remain the Owner’s property, cleared materials are the Contractor's property. Remove cleared materials from site and dispose of in lawful manner.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store where indicated on plans or where designated by the Owner. Avoid damaging materials designated for salvage.

C. Unidentified Materials: If unidentified materials are discovered, including hazardous materials that will require additional removal other than is required by the Contract Documents, immediately report the discovery to the Owner. If necessary, the Owner will arrange for any

testing or analysis of the discovered materials and will provide instructions regarding the removal and disposal of the unidentified materials.

D. For any utility lines which are to be partially demolished, the Contractor shall provide new operable service re-connection all the way to the extent of the utility source if needed to maintain service. This includes the lowered of any utilities lines to achieve minimum cover requirements.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Backfill excavations resulting from demolition operations with on-site or import materials conforming to structural backfill which is defined as soil materials approved by the Geotechnical Consultant and used to fill excavations resulting from removal of existing below grade facilities, including trees. See Section 31 23 33 – Trenching and Backfill.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points during construction.

B. Protect existing site improvements to remain during construction.

3.2 RESTORATION

A. Restore damaged improvements to their original condition, as acceptable to the Owner.

3.3 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned.

B. Arrange to shut off indicated utilities with utility companies or verify that utilities have been shut off. Coordinate all service interruptions with College Staff.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless authorized in writing by the Owner, and then only after arranging to provide temporary utility services according to requirements indicated.

D. Coordinate utility interruptions with utility company affected.

E. Do not proceed with utility interruptions without the permission of the Owner and utility company affected. Notify Owner and utility company affected two working days prior to utility interruptions.

F. Excavate and remove underground utilities that are indicated to be removed.

G. Securely close ends of abandoned piping with tight fitting plug or wall of concrete minimum 6-inches thick.

3.4 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, and gutters, and any associated reinforcement/rebar, as indicated. Where concrete slabs, curb, gutter and asphalt pavements are designated to be removed, remove bases and sub-base to surface of underlying, undisturbed soil. Joint to Joint removal of hardscape must be met.

C. Unless the existing full-depth joints coincide with line of pavement demolition, neatly saw-cut to full depth the length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

D. Remove driveways, curbs, gutters and sidewalks by saw cutting to full depth. If saw cut falls within 60-inches of a construction joint, expansions joint, score mark or edge, remove material to joint, mark or edge.

E. Any tree designated to be removed shall have its root mass completely removed by excavation. The use of a stump grinder may be used in conjunction with excavation methods.

3.5 BACKFILL

A. Place and compact material in excavations and depressions remaining after site clearing in conformance with Section 31 00 00 and to the satisfaction of the Geotechnical Consultant.

3.6 DISPOSAL

A. Remove surplus obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

END OF SECTION 024000

SECTION 321313

CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

B.
1. Walks.

C. Related Sections:

1. Section 311000, Site Preparation.

1.3 REFERENCES

A. Organization and Trade Standards

1. Standard Specifications for Public Works Construction, latest edition, as adopted by local jurisdictional authority, including amendments.
2. Regional Standard Drawings, current edition, with all local agency amendments.

1.4 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.5 SUBMITTALS

A. Mix Design/Materials List:

1. Submit concrete mix design prepared by a certified batch plant or laboratory, selected by Contractor and acceptable to Owner, for review and approval.
2. Accompanying mix design, submit materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. For the following, from manufacturer:

    a. Cementitious materials.
    b. Steel reinforcement and reinforcement accessories.
    c. Admixtures.
    d. Curing compounds.
    e. Joint fillers.

B. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Mock-up

1. Prior to installing any concrete paving, construct, at an approved location on-site, an individual mock-up showing each concrete paving finish specified and shown on drawings. Mock-up shall include sealant joint preparation. Each finish shall be 4' x 4' minimum. Obtain Architect's approval of mock-up.
2. All concrete paving shall match approved mock-up.
3. Remove mock-up after completion of work and dispose off-site.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

D. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F (4.4 deg C) for oil-based materials or 55 deg F (12.8 deg C) for water-based materials, and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. General

1. All improvements shall be constructed per the referenced standards, the contract documents, and as specified in this section.
2. Where criteria shown on drawings or specified in this specification exceed that of the referenced standards, the more stringent criteria shall apply.
3. All concrete is to be batched in a certified plan capable of achieving DSA Waiver of continuous batch plant inspection.
4. All concrete to be produced by the same batch plant.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

B. Plain-Steel Wire: ASTM A 82/A 82M.

C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs. Provide polyethylene closed-end sleeve or approved alternate at expansion joint dowels

D. Where deformed bar reinforcing not shown, provide welded wire fabric, flat sheet stock, 12x12-W2.8x2.8 or approved equivalent, per ASTM A-185, at all concrete paving conditions.

E. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

F. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

H. Zinc Repair Material: ASTM A 780.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, gray portland cement Type V, produced in the United States. Supplement with the following:

a. Fly Ash: ASTM C 618, Class C.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

2.5 CURING MATERIALS

A. Water: Potable.

B. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

C. Clear, Type 1, per Section 201-4 of Standard Specifications.

1. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following recommendations:

    a. ChemMasters; Safe-Cure Clear.
    b. Dayton Superior Corporation; J-18 Safe Cure & Seal
    c. SpecChem, LLC; PaveCure Rez.

2. Cure and Sealing Compound

    a. Products: Basis of Design - Provide Burke Spartan-Cote WB, complying with ASTM C309, Type 1-A and B, at natural color exterior concrete paving.

2.6 PAVING BASE

A. Where shown on drawings, provide crushed aggregate base per Section 200-2.2.1 of the Standard Specification for Public Works Construction "Greenbook".

2.7 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Expansion Joint Material: W. R. Meadows or equal, Sealtight Fiber filler, full depth of slab, matching profile, 1/2 inch thickness or as shown on drawings.

C. Expansion Joint Material - Radius Conditions: W. R. Meadows or equal, Sealtight Ceramar flexible foam resilient filler, full depth of slab, 3/8 inch thickness or as shown on drawings.

2.8 PAVEMENT MARKINGS

A. Glass Beads: AASHTO M 247, Type 1.

2.9 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M) and Public Works Construction Standard Specifications (Green Book), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Product Characteristics: Paving/flatwork/ramps/stairs:

1. Compressive Strength: 3250 psi. Strength selected for durability. Concrete is non-structural, and does not require special inspection.
2. Combined Aggregate Grading:

    a. Class C per Standard Specification for Public Works Construction "Greenbook" Section 201-1.3.2

SECTION 311000

SITE PREPARATION

PART 1 - GENERAL

1.1 SECTION INCLUDED

A. All labor, materials, tools, equipment, transportation, and temporary construction of any nature necessary for a complete operational installation of all work shown on the Plans and/or specified hereinafter.

1.2 RELATED DOCUMENTS

A. Section 014524, Environmental Import & Export

B. Section 024000, Demolition

C. Consult all other Specification sections, determine the extent and character of related work, and properly coordinate work specified herein with that specified elsewhere to produce a complete operational installation.

1.3 REFERENCES

A. California Department of Transportation (CDT):
   1. Standard Specifications: Sections 16.

B. National Arborists Association:
   1. Pruning Standards and Practices.

C. Geotechnical Report:
   1. A geotechnical report will be not be provided by the District, however the Contractor shall perform sufficient tests and inspections and the Inspector of Record is to be available during grading to verify compliance with the plans and code. Engineered fill shall be tested for structural capacity.

D. Storm Water Pollution Prevention Plan:
   1. A SWPPP report will be provided by the District.

1.4 SITE CONDITIONS

A. General:

   1. Clearing work shall not begin until temporary fences, barricades, warning signs and other pedestrian control devices are installed. Temporary fencing around the perimeter of the site shall be paid for and provided by the Contractor for the duration of the project.

   2. All trees, plants, utilities and existing improvements that are not to be removed shall be protected from injury or damage resulting from the Contractor's operation. The Contractor shall replace all damaged landscaping, improvements or utilities either in kind, or as stipulated in the landscape

plans or specifications, whichever is more severe. Such repair and/or replacement work shall be considered as included in other items of work, and no additional compensation will be allowed.

B. Salvage: Contractor shall take care when removing salvageable material to avoid damaging the material itself or the adjacent or adjoining structures that are to remain.

C. Existing Subsurface Utilities:

1. Existing subsurface facilities are shown on the Plans to help the Contractor avoid damage to essential utilities which must remain in service. The accuracy or completeness of existing utility information cannot be guaranteed.

2. The Contractor shall ascertain the exact location of all underground facilities prior to doing work that may damage such facilities. If the Contractor discovers underground facilities not indicated on the Plans or in a location different from what is indicated on the Plans, the Contractor shall protect such facilities from damage and notify the Construction Manager immediately if a conflict exists.

3. Although irrigation lines smaller than 3" in diameter are typically not shown on the Plans, all landscaped areas are served by automatic irrigation systems. Unless otherwise indicated on the Plans, the Contractor remove and cap irrigation lines.

D. Existing Building(s) Foundation:
1. Contractor to provide survey of piles and document exact location and dimension fo existing piles, pile caps and grade beams.. Contractor to provide as-builts of caps/piles/grade beam with horizontal/vertical dimensions.

E. Protection of Existing Trees:

1. All trees greater than or equal to 6 inches in diameter not specifically designated for removal are to remain and shall be protected. Unless otherwise noted, all trees less than 6 inches in diameter located more than 3 feet from a utility trench or surfaced area under construction are to remain and shall be protected.

2. Trees to remain shall be safeguarded during construction by implementing the following restrictions:

a. No storage of oil, gasoline, or chemicals within tree driplines.

b. Minimal grading within tree driplines.

c. No dumping of liquid or solid wastes within the dripline of or uphill from any tree.

d. Construction of barricades around tree trunks to protect them from injury.

3. The following shall not be permitted:

a. Using trees as support posts; power poles; sign post; anchorage for ropes, guy wires, and power lines; or other similar functions.

b. Poisoning items by disposing of paint, petroleum products, dirty water, soil sterilants, or other deleterious material on or around roots.

c. Excessive water or heat from equipment, utility line construction, or burning of trash under or near shrubs or trees.

d. Unnecessary compaction of root area by moving trucks; grading machines; storage of equipment, materials, or supplies; etc.

e. Damage to trunk or limbs caused by maneuvering of vehicles or equipment, or stacking of materials and equipment.

f. Damage to root system from flooding, erosion, excessive wetting and drying resulting from de-watering and other operations.

PART 2 PRODUCTS

2.1 NOT USED.

PART 3 EXECUTION

3.1 DEMOLITION, REMOVAL, ABANDONMENT, STRIPPING, AND GRUBBING

A. Demolition:

1. Existing asphalt concrete paving, concrete curbs and walks shall be broken up and removed where shown on the plans for new construction, including any associated concrete reinforcement or rebar. In addition, the baserock material underneath paved areas shall be removed.

2. Existing on-site underground utilities conflicting with construction shall be cut off and capped, removed entirely, or relocated as indicated on the plans.

3. Existing concrete structures or portions of structures extending below new structures shall be removed entirely. In all other areas, existing concrete structures or portions of structures below grade shall be removed to a depth of at least 3 feet below finished grade and broken in a manner that will prevent water entrapment.

4. Explosives shall not be used.

B. Removal:

1. Traffic stripes and pavement markings shall be removed by any method that does not materially damage the existing pavement. Pavement marking images shall be removed in such a manner that the old message cannot be identified. Where grinding is used, the pavement-marking image shall be removed by grinding a rectangular area. The minimum dimensions of the rectangular area shall be the height and width of the pavement marking. Residue resulting from removal operations shall be removed from pavement surfaces by sweeping or vacuuming before the residue is blown by the action of traffic or wind, migrates across lanes or parking areas, or enters into drainage facilities. Traffic stripes shall be removed before any change is made in the traffic pattern.

C. Stripping:

1. Existing topsoil shall be stripped to a depth of 2” to 4" (or deeper where directed by the Soils Engineer) as necessary to remove all vegetation, organic matter, or other objectionable material in those areas to be graded.

2. Topsoil not containing vegetation may be stockpiled on-site for later use as topsoil backfill.

D. Grubbing and Trimming:

1. Trees designated for removal shall be removed to a point at least one foot below the lowest level of subgrade upon which fill will be placed.

2. Tree branches which extend over the line of construction and which hang within 15 feet of finished grade shall be cut off under the direction of the Owner's representative.

3. Pruning operations shall be extended to restore the natural shape of entire tree as directed by the Owner's representative.

E. Excavation Around Trees:

1. Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging. Main lateral roots and tap roots shall not be cut. Roots smaller than 3" that interfere with installation of new work may only be cut if approved by the project Arborist.

2. Where excavation for new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root systems. Roots shall be relocated in backfill areas wherever possible. If large, main lateral roots are encountered, they shall be exposed beyond excavation limits as required to bend and relocate without breaking.

3. Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be packed with wet peat moss or 4 layers of wet untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill.

4. Branching structure shall be thinned in accordance with National Arborists Association "Pruning Standards and Practices" to balance loss to root system caused by damage or cutting of root system. Thinning shall not exceed 30% of existing branching structure.

3.2 FILLING AND BACKFILLING

A. Pits or depressions resulting from the above operations shall be filled and compacted prior to performing any earthwork.

B. Material to be used for filling shall be select on-site or imported fill material approved by the Soils Engineer. Cement slurry may also be used as approved by the Soils Engineer.

C. Fill material shall be compacted to 90% maximum density. Relative compaction will be tested in accordance with Section 02 30 00.

3.3 DISPOSAL

A. All debris, site strippings, and objectionable material shall be the property of the Contractor and shall be removed and disposed of in a legal manner off the Owner's property.

B. Disposal shall be performed as promptly as possible after removal of the material and shall not be left until the final clean-up period.

END OF SECTION 311000

b. Aggregate shall be non-reactive per ASTM C 289, and shall comply with ASTM C33, Table 3, Class 4M.

3. Cement Content: 560 pounds per cubic yard concrete
4. Slump: 4 inch maximum
5. Finish:

a. Broom finish natural concrete paving.
b. Broom finish integral color concrete paving.

6. Water-Cement Ratio: 0.45 maximum.
7. Integral Color Admixture: Scofield Chromix or equal.
8. Surface Retarder: Scofield Lithotex Top Surface Retarder or equal.

C. Product Characteristics: Curbing, gutters, related drainage components.

1. Compressive Strength: 3250 psi
2. Combined Aggregate Grading:

a. Class C per Standard Specification for Public Works Construction "Greenbook" Section 201-1.3.2

3. Cement Content: 520 pounds per cubic yard concrete
4. Slump: 4 inch maximum
5. Finish: Per Section 303-5.5.2 of Standard Specifications for Public Woks Construction, "Greenbook," and with flatwork finishes as defined in this Section and per Drawings.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture in concrete as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Cementitious Materials: Limit percentage by weight of cementitious materials other than portland cement according to ACI 301 (ACI 301M) requirements for concrete exposed to deicing chemicals. As follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperatue is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Division 31 – Earth Moving.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Verify sub-grade, base material, conduit, and all other embedded items are properly located in relation to concrete paving. Secure all embedded items against displacement during pour.

B. Verify all grades for pitch and fall prior to pouring pavements.

C. Verify that all cross-fall and ramp criteria comply with all accessibility regulations, including Title 24 requirements.

D. Verify compaction of existing subgrade complies with criteria specified in Division 31 – Earth Moving.

E. Notify inspector 48 hours prior to placing concrete. Obtain inspectors approval of subgrade, forming and embedded items prior to placing.

F. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage. Coat forms with approved bond breaker, suitable for use on integral colored concrete without staining or discoloration. Place sand bed over existing paving receiving new concrete paving.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation (Expansion) Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Provide expansion joints at intervals of 50 feet (15.25 m) unless otherwise indicated.

2. Provide where paving is adjacent to walls, bollard or column penetrations, light pole, utility box or footings.

3. Provide at pavement plazas and fields, approximately 20 feet on center each way, and as necessary to limit area to a maximum of 400 square feet.
4. Extend joint fillers full width and depth of joint and terminate not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
5. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
6. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together
7. Tool all edges adjacent to expansion material with maximum 1/8 inch radius tool..
8. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint and provide bondbreaker tape at surface of joint material cover cap.
9. Provide sealant and backer rod assembly per Division 2, “Pavement Joint Sealants” when provided, if not see Division 7, “Joint Sealants” and as shown on drawings

D. Contraction (Control) Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

    a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

    a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
4. Provide at curbs, curb and gutter assemblies, and cross gutters at 20 feet on center maximum. Where concrete pavement occurs adjacent to curb, align curb and pavement joints.
5. Provide at pavement plazas and fields, approximately 10 feet on center each way, and as necessary to limit area to a maximum of 100 square feet.
6. Provide at pavement areas at all re-entrant corners and at changes in direction.
7. Provide control (weakened plane) joints by saw cutting method, hand held jointing tools, or by use of SOF-CUT equipment. Use of zip-strip not acceptable.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced

shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

L. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by curing compound as follows:
   1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

   1. Level: 3/16 inch plus or minus, at any point, measured along a 10 foot straight edge.
   2. Adjacent surfaces: 1/8 inch maximum difference at any point between adjacent concrete pours or between paving and adjacent paving materials.
   3. Joint Alignment: 1/16 inch deviation from adjacent joint.
   4. Line: 1/4 inch, plus or minus, deviation from a straight line in any 10 foot length, non-cumulative.
   5. Final elevations shall comply with grades as shown on drawings, to a tolerance of plus or minus 0.25 inch.
   6. Tolerances do not permit violation of dimensions or grade and slopes relationships required by code or jurisdictional authority. Adjust work as required to comply with such requirements.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow concrete paving to cure for a minimum of 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

   1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
   2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.11 WHEEL STOPS

A. Install wheel stops in bed of adhesive applied as recommended by manufacturer.

B. Securely attach wheel stops to paving with not less than two galvanized-steel dowels located at one-quarter to one-third points. Install dowels in drilled holes in the paving and bond dowels to wheel stop. Recess head of dowel beneath top of wheel stop.

3.12 FIELD QUALITY CONTROL

A. Flood Test

1. Provide flood test of all gutters and paving as directed by Architect.
2. Where ponding occurs, or where drainage rate is less than that established by original design, replace all defective concrete. Remove concrete to the nearest joint line.

B. Appearance

1. Remove and replace concrete not matching approved mock-up, concrete not complying with specified tolerances, and concrete with the following defects.

    a. Inconsistent texture.
    b. Irregular or misaligned direction of texture.
    c. Concrete with spalled or raveled control or expansion joints.
    d. Concrete exhibiting splotching or discoloration in surface including discoloration due to "carbonation".
    e. Concrete exhibiting cracking, including shrinkage cracking, where cracks are located between joint pattern.

2. Use of patching mortar for repair of edge defects is subject to acceptance of final color and texture by Architect. Use of patching mortar not acceptable for repair of defective exposed aggregate finished concrete.

C. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

D. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

H. Concrete paving will be considered defective if it does not pass tests and inspections.

I. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

J. Prepare test and inspection reports.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Use of patching mortar for repair of edge defects is subject to acceptance of final color and texture by Architect. Use of patching mortar not acceptable for repair of defective exposed aggregate finished concrete.

C. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

D. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

E. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313