

# LACHIN Architects, apc

## Calcasieu Parish School Board Sulphur High School Building 5 HL-052-01

September 29, 2023

### ADDENDUM NO. 1

This Addendum, applicable to work designated herein below shall be understood to be an Addendum and as such shall be included in the "Contract Documents" dated September 5, 2023.

Following are the changes, amendments, deletions or additions to components of the "Contract Documents" as now written or drawn. All provisions of the General Conditions of the Contract for Construction, Supplementary Conditions, and other pertinent portions of sections in Division 1 through Division 33 of the Project Manual Specification shall apply to this Addendum.

#### GENERAL

Item No. 1: **ADD** the attached "Notes of Pre-Bid Meeting" and "Sign-in Sheet" to the Project Manual.

Item No. 2: **ADD** the below questions and answers to the Project Manual.

1. The Unit Price Form in the bid documents has the description of the items in the Unit Price column. It also doesn't identify items No. 4 & 5 as "Base Bid" or "Alternate." Can this form be updated for our use?

*The unit price form will be revised and reissued by future addendum.*

2. Will flood coverage be required on this project? a. If it is required, the following was requested by my insurance provider: i. In order for me to be able to obtain flood quotes through NFIP, I will need the approximate replacement cost per building for each of the six (6) buildings. The flood coverage would of course not be written for the replacement cost amount, it is just that with NFIP, their rating system takes into consideration the replacement cost of the building, therefore I must have the approximate replacement cost per building to be able to obtain flood quotes.

*Flood coverage is required, refer to article 11.2.5.1, 11.2.5.2, and 11.2.3.3*

3. Does the structure have fire walls? If so, number of fire walls? Fire wall rating (number of hours)? Do fire walls extend between floors? Will fire walls extend higher than 2' above the roof line?

*It is unknown whether fire walls exist and what their ratings are. There is no scope to move or modify walls to extent that would compromise any rating. Wall repair is mostly limited to cosmetic repairs.*

4. Will the school be in use by students during the construction process? How many people are expected to be on site during the construction process? How much of the interior work can we expect to have access to at a given time?

*Yes, the school will remain fully occupied during construction. There are approximately 1500 students and teachers on site. Work and phasing of the work will be discussed with the awarded contractor at the pre-construction meeting.*

5. Overhead protection that is noted by Note #17 in the General Roofing Notes. What is expected for overhead protection? Are we to set overhead protection to create a safe path to walk through the courtyards or set overhead protection at the full perimeter of the courtyards? Also are we to

set the overhead protection only over sidewalks on the outside of the buildings or the full perimeter of the buildings?

*Overhead protection is to be provided at the edge of courtyards and at high traffic areas beneath EIFs, stucco, or metal panel replacement. Overhead protection means and methods are to be by the contractor.*

6. In regard to Floor Plan Key Note #20A on A104. It calls to both repaint the wall from corner to corner and restore the Spiderman Mural on the wall. Is this mural something that can be touched up or painted over then recreated?

*It should be anticipated by bidders that the wall is to be repainted corner to corner with a single color. This item will be reviewed during construction with the school prior to painting of this particular room.*

7. In the interior pictures the looks to be a substantial amount of furniture and supplies within the rooms as well as items on the walls. Will the school board be responsible for moving furniture and clearing off the walls for construction or will we be responsible for this?

*The school, or teacher, will move/remove person items. The contractor is responsible for relocating and protecting all furniture and remaining contents. On interior walls to be painted, removable items such as markerboards and tackboards are to be removed prior to painting the wall.*

8. There are varying degrees of damage seen in the photos of Floor Plan Key Note #20 (Repair crack in CMU wall). We would like guidance as to the extent of the repairs for the cracks. Are we to simply repoint the mortar? Maybe use an elastomeric caulk to prevent future cracking if there is slight movement in the structure? Also, will the repairs be done to the ceiling height, or will we need to remove sections of the ceiling to repair the cracks that propagated above the ceiling?

*The repair method for CMU joints will be addressed by future addendum.*

9. In reference to the Note #6 in the Awning Key Notes on Sheet A005, are we to determine if the fastening system is compromised prior to bid?

*For the scope of work at the joist and bracket Note #5 & #6. The contractor is to bid the following:*

*Remove and replace one new 20K3 joist approximately 23' in length with the actual length field verified by the contractor. Joist to be hot dip galvanized by joist manufacturer and designed and constructed in accordance with applicable SJI requirements. Contractor to submit shop drawings for joist to be reviewed by the design team. Existing purlins are to remain and be temporarily supported during demolition of existing joist and installation of new joist. Re-weld existing purlins to new joist, repair damage to galvanized areas with a "cold-galv product" to be submitted for review by the design team.*

*At the brackets identified for repair/removal, temporarily support joists as required during demolition and after removal of brackets. Remove the two existing North end brackets at the West side of the canopy structure. Protect existing brick veneer, backing CMU wall, and all surrounding improvements from damage during demolition activities. Contact design team for inspection of existing conditions at wall and also inspection of bracket piece once demolition is complete. Demolition and temporary supporting work are the only items required to be priced in bid submission. The final intent is to drill new holes in the existing brackets and re-use the existing brackets. The additional work beyond demo and removal of the brackets will be reimbursed through a change in contract during construction.*

10. How can we set up site visits to walk the job with subcontractors besides the Prebid conference?

*Contractors can contact the school directly to schedule a visit.*

11. Elevations Key Note #2: Says we are to replace any rusted or damaged metal framing. Are we to bid this with the assumption of needing to replace all framing or a certain percentage of framing? There is no way of knowing the extent prior to bid.

*The replacement of rusted or damaged metal framing will be addressed by future addendum.*

12. There is a Floor Plan Key Note #13 calling to replace damaged hand rail systems. Also Spec section 055213 is for Pipe and Tube Railings. I have not been able to find the location of this in the drawings. Is the location tag missing or is this not a part of the scope?

*This scope will be removed via addendum. The specification will be removed via addendum.*

13. On Sheet A202.4, Photo 441(Classroom 4205): The note under the photo says there is damage to the casework. There is not a note in the floor plan that says to repair this casework, is this casework to be repaired?

*The casework in these photos has tape residue on them from when they were protected with plastic during mitigation. The residue is to be cleaned off of the laminated casework finish.*

14. Reflective Ceiling Plan Note #6: Calls to remove and replace the existing metal support system at damaged soffit area. Is this calling for the complete removal of all framing and replacing or just the damaged support members? My subcontractor has also voiced concern as to how the existing metal framing is constructed at the plan Southwest corner of Building 4. Can you provide a Detail as to how you wanted the new framing system to be constructed.

*Metal framing support system is to be replaced completely in its entirety wherever metal soffits are called to be replaced.*

15. General Elevation Notes #2: Says to pressure wash ALL exterior surfaces free of dirt and organic materials. Can we get a clarification of what surfaces are to the pressure washed, all vertical surfaces of all buildings, the metal roof that's not replaced, any concrete? Can we also get a clarification of the methods we are to use per surface? Under 500 psi, I would assume we are to use chemicals and provide a sort of "soft wash."

*To clarify this note, power washing (500psi max) is to be done at all EIF's areas to remain that are not being removed and replaced. This pertains to all elevation areas identified with Elevation Keynote #1 on drawings A203 – A205.*

16. Please confirm there are only (2) interior signs required for replacement; which is on drawing A104. Please provide specification.

*Interior signage will be added to the east library wall as well. Signage to be Cut Aluminum Dimensional Letter Signage with Baked Enamel Finish. Signage height to be 10" minimum, signage depth to be 1/2" thick, flush mount. Basis-of-design to be ASI Signage, Series LPS Cut Metal Dimensional Letters or approved equal. Contractor to include 50 total letters in their bid for all interior signage.*

17. Please confirm SF of Low Slope Roof to be replaced. Drawing A001 – General Note #13 states(165,000) SF; however, we have totaled up to (119,225) SF after adding up Keyed Note Item #1.

*General Note #13 will be revised to 1,200 squares or 120,000 SF. With that being said, it is the contractor's responsibility to verify all quantities of readily visible material identified in the documents prior to bid.*

18. Please confirm SF of Metal Roof to be replaced. Drawing A001 – General Note #14 states (8,000) SF; however, we have totaled up to (9,900) SF after adding up Keyed Note Item #2.

*General Note #14 will be revised to 100 squares. With that being said, it is the contractor's responsibility to verify all quantities of readily visible material identified in the documents prior to bid.*

19. Is the "Suspended Canopy" specification provided for the (1,900) SF referenced on Drawing A001 North of Building 2?

*No, this specification does not apply. The specification 10 73 00 "Suspended Canopy" will be removed from the project manual.*

20. Is contractor to assume that all wood blocking on drawing A002-A005 in effected roof areas is to be removed. Please specify the amount to be required in base bid.

*This item will be clarified through future addendum.*

21. Please provide specification for tackboards/markerboards.

*This item will be clarified through future addendum.*

22. Please provide specification for stage curtains and supports.

*Refer to specification section 11 61 43 "Stage Curtains" included in the specifications.*

23. Please provide specifications for parking sign.

*Parking signage material, size and text shall match existing. There should be no specification required. Minimum requirements for signage are 18"x12" dimension, 63 mil thick aluminum, with pre-printed ink. Corners of signage are to be rounded and pre-drilled holes are to be included as required for mounting.*

24. Please define cleaning and pressure washing locations for exterior areas. Drawing A203-A205 Note #2 states all exterior surfaces. Does this apply only to areas of defined scope repairs or all Buildings surfaces (Bldg 1, 2, 3, 4, 6, and/or 9)?

*To clarify this note, power washing (500psi max) is to be done at all EIF's areas to remain. This pertains to all elevation areas identified with Elevation Keynote #1 on drawings A203 – A205.*

25. Please define scope of work requirement of roof hatch mentioned on A201.1 Photo 251. There is no scope of work mentioned for this item in the other documents.

*Contractor is to replace the existing damaged roof hatch identified in the photos. Refer to specification section 07 72 00 "Roof Accessories" for roof hatch specification.*

26. Please provide roof details for "Mechanical Plant" building.

*Sheet A001 will be revised and replaced via addendum and include detail references to rooftop items.*

27. The Final Cleaning specification mentions "Pest Control". Will the contractor be responsible for "Pest Control" during project or upon completion.

*The reference to Pest Control shall be removed. There is no requirement for "Pest Control during the project.*

28. Is there any metal decking replacement required in the base bid or will it only be required as an Unit Price?

*Metal decking replacement will be replaced by unit price only.*

29. Is the intent to remove and reinstall any rooftop units and/or equipment during roof replacement? They are not listed to remove during roof replacement as a scope item. (Ex. Equipment and metal platforms at West & East of Building 6 / At Mechanical Plant Building)?

*Existing metal platforms supporting mechanical equipment are not intended to be removed. Rooftop equipment scheduled for removal and replacement are identified in the Mechanical Drawings and Specifications. All modifications to mechanical equipment curbs and pipe penetrations required due to roof replacement shall be included in the contractor's bid. It should be noted that the newly designed ASCE-7 compliant roof system will require additional insulation, therefore, increasing the depth and finish height of the roof. Curbs and pipe penetrations will have to be raised or extended to comply with the roofing manufacturer's requirements for freeboard.*

30. Please provide contact or protocol for any additional site visits.

*Contractors can contact the school directly to schedule a visit.*

31. Is the contractor to include any LT WT Concrete demo or repairs at roof in base bid? Please see Detail 2 On Drawing A001.1.

*No, quantities or condition of lightweight concrete is unknown. The detail is provided as a reference should damaged lightweight be encountered. If damaged lightweight is encountered, the cost to remove and replace will be a change to the contract.*

32. Please define scope of work on Drawing A202.2 - Photo #305 & 306. Will this be a crack type repair or tile replace repair?

*The documents identify Keynote #20, interior crack repair. No tile replacement is identified in this area.*

33. Please define scope of work requirement and "Extent Of" for Alum Windows on A201.2 Photo 657. There is no scope of work mentioned for this item in the other documents.

*The damaged windows in photo 657 have already been replaced by the owner. The Keynote in this area was removed and photo 657 should have been subsequently removed as well. This photo will be removed via addendum. There is no scope of work for this item.*

34. Please clarify keyed note Item #100 on drawing A104.

*Keynote Item #100 is to be changed to Keynote Item #19.*

## DRAWINGS

Item No. 3: **ADD** the attached 24" x 36" Abatement Drawing Sheet included in this Addendum to the Construction Documents.

## SPECIFICATIONS

Item No. 4: **ADD** the attached Abatement Specifications to the Project Manual. Added Abatement Specification Sections are as follows:

Abatement Specification Cover Page	
Abatement Specification Table of Contents	
Post project Submittal Package	
02 80 10	Summary of Work – Asbestos Abatement
02 80 15	Coordination – Asbestos Abatement
02 80 21	Reference Standards and Definitions – Asbestos Abatement
02 80 22	Codes, Regulations and Standards – Asbestos Abatement
02 80 30	Submittals – Asbestos Abatement
02 80 40	Construction Facilities and Temporary Controls – Asbestos Abatement
02 80 41	Temporary Pressure Differential & Air Circulation System – Asbestos Abatement

02 80 42 Temporary Enclosures – Asbestos Abatement  
02 80 43 Regulated Areas – Asbestos Abatement  
02 80 44 Worker Protection – Asbestos Abatement  
02 80 45 Respiratory Protection – Asbestos Abatement  
02 80 46 Decontamination Units – Asbestos Abatement  
02 82 05 Materials and Equipment – Asbestos Abatement  
02 82 06 Substitutions – Asbestos Abatement  
02 82 08 Project Decontamination – Asbestos Abatement  
02 82 33 Removal of Asbestos Containing Materials – Asbestos Abatement  
02 82 35 Disposal of Regulated Asbestos Containing Materials – Asbestos Abatement  
02 82 70 Contract Closeout – Asbestos Abatement

**END OF ADDENDUM**

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**NOTES OF PRE-BID MEETING**

**Sulphur High School**

**09-27-2023**

**Notes By:** David M. Lachin, Jr.

**Location:** Sulphur High School

**Attendees:**

David M. Lachin, Jr.  
Natalie Graham  
David Pool  
Mark Aymond  
Scott Schneidewind  
Chris White

**Distribution:**

Attendees  
Sign-In Sheet

**Date:** 09-28-2023

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The purpose of the meeting was to review scope of work and bid requirements. The following notations were made at the time of the meeting.

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Project bid date is October 10, 2023. Bids will be received and opened at 11:00am at the Calcasieu Parish School Board Office.

Project scope is generally as follows:

- Campus-wide replacement to existing roof systems including flashing, gutters and downspouts.
- Campus-wide repairs to hurricane damaged exterior finish systems including but not limited to metal panels, EIFs, and stucco
- Campus-wide repairs to hurricane damaged interior finish systems including floors, walls, ceilings, acoustical panels, casework, etc...
- Campus-wide repairs/replacement of hurricane damaged Mechanical, Plumbing and Electrical systems.

It was reiterated by the design team that this is a FEMA-funded project, therefore, components replaced are to be replaced "in like kind" with systems to match existing.

Most of the major storm damaged mechanical equipment called out by the drawings to be replaced (in kind with new) may be currently covered by temporary roofing. Contractors are to perform a rooftop site visit prior to bid to review current existing conditions and based on field observations price non-verifiable mechanical equipment performance based on mechanical schedules and quantities identified in the drawings. The equipment schedule was created by the design team after reviewing available existing mechanical construction documents. The awarded contractor will be required to verify actual damaged mechanical equipment to be replaced in kind and report any discrepancies to the Architect prior to submission of replacement equipment shop drawings. Any temporary roof modifications required to verify the mechanical equipment are to be made and repaired by the contractor until the permanent roof replacement is complete.

Contractor is reminded that there is to be an allowance which is to be included in the bid for the controls scope of work. This allowance number will be released via addendum.

The construction duration for the project is 550 calendar days from the NTP.

Bids received after the time and date for receipt of bids will not be opened.

Bids shall be submitted in a sealed opaque envelope. The bid envelope shall be identified on the outside with the name of the project, and the bidder's name, address, and Louisiana Contractor's license number.

Bidders may choose to submit their bid electronically in accordance with Louisiana Revised Statute 38:2212 A(1)(f)(i). Electronic bid submission is available through Central Bidding at [www.centrauctionhouse.com](http://www.centrauctionhouse.com).

Bids will be opened publicly.

The Contractor is reminded to fill out the bid form completely and properly and include an authorization signature for the bid.

Contractor is reminded that the apparent low bidder shall furnish post bid information to the architect no later than 10 calendar days after the bid date. Post bid information includes Non-collusion Affidavit, Verification of Employees Affidavit, Attestation of Bidders and Byrd Anti-Lobbying Certification.

The bidder to whom the contract is awarded will be required to furnish a Payment and Performance Bond. The bond shall be equal to 100% of the contract amount.

Bid Security shall be included with the bid in the amount of 5% inclusive of the base bid and alternates (as applicable).

Bid Bond shall be in the form of a certified check, cashier's check or bid bond, as outlined in the Instructions to Bidders.

Contractors are reminded to thoroughly familiarize themselves with all plans, specifications, and addenda. Bidders shall forward any prior approval requests and questions relative to the bid documents in writing to the attention of the Architect no later than seven business days prior to the bid date. Email is an acceptable form of submitting questions. All questions and responses will be shared with bidders via addendum.

Substitution requests (prior approvals) must be submitted through and by Prime bidders only.

Substitution requests (prior approvals) must include the substitution request form located immediately after the Substitution Request Specification.

No questions or prior approval requests will be responded to beyond seven business days before the bid, therefore, Friday, September 29, 2023 is the final day to submit questions.

Final addenda will be issued no later than three business days before the bid or October 5, 2023.

After award of the contract, contractor is responsible for reproduction of project documents.

Bidding contractors shall familiarize themselves thoroughly and completely with actual job site conditions, as well as the General and Supplementary Conditions of the Contract Documents.

By submitting a bid, contractor certifies that they have confirmed all material, equipment, and labor are available to complete the project in the timeframe stipulated and in the amount of the Bid Proposal.

Insurance coverage shall be as outlined in the Contract Documents.

Shop drawings and submittals shall be prepared, reviewed by the contractor, and submitted in accordance with the project documents. Submittals shall be carefully coordinated to allow for full review and processing by the consultants.

A building permit is required. The contractor shall be responsible to apply for and acquire the permit. The contractor shall be responsible for paying all inspection fees and any additional AHJ fees.

Testing and inspections will be selected and paid for by the Owner and coordinated by the Contractor.

Use of site shall be limited to areas of work indicated in the plans.



Change Order forms included in the Project Manual are required. Cost adjustments shall be fully itemized and submitted within timeframes indicated in the Contract Documents.

The Schedule of Values shall be developed in the format included in the Project Manual.

Photo documentation and daily reports are to be submitted as stipulated in the Project Manual.

Substantial Completion shall not be issued until all conditions identified in the Project Manual are satisfied and systems have been successfully tested, demonstrated, and commissioned. Additionally, all warranties must be issued with final acceptance by the State Fire Marshal's office. Final testing and balancing reports must also be delivered to the Architect.

The drawings are under review by the SFM.

Contractor will be required to protect existing structures, finishes, equipment, utilities and vegetation (trees). Any damages caused by the construction activities are to be repaired to the satisfaction of the Owner and Architect at Contractor's expense.

The contractor will be allowed to work during any hours allowed by the Calcasieu Parish School Board. However, the school will remain in operation during construction so there will be limitations on access to the site at certain times and noise limitations during student testing. Limitations will be discussed with the awarded contractor at the pre-construction meeting.

The contractor shall provide overhead protection at high traffic areas where falling debris is likely. This pertains to areas of high traffic beneath EIFs, stucco, and metal soffit removal and replacement.

At Building 1, the roof has been found to contain hazardous materials. Abatement and material removal documents will be incorporated via addendum. It will be the contractor's responsibility to include this scope of work in their bid. Hazardous material testing during removal will be provided by owner. Abatement scope and value should be identified as a separate line item in the contractor's schedule of values.

CPSB has identified that the Library and Auditorium work is most critical and should be completed first if possible. That will allow these areas to be freed up as swing space for other areas (or classrooms) during construction.

Contractor access to site during bidding should be coordinated through the Calcasieu Parish School Board Construction Department office.

This project will be exempt from sales tax.

These Notes of Pre-Bid Meeting and any associated questions will be made part of the contract through addendum.

Sign in sheet attached.

#### Questions and Answers

Question 1: Is there any phasing schedule for the exterior scope of work?

*Answer 1: No, the contractor will be responsible for coordination with the school. Proposed phasing will be discussed at the pre-construction meeting with the awarded contractor.*

Question 2: Where there be a lay down area?

*Answer 2: Yes, the parking lot across from the entrance to the main building (where front office is located) will be used as the contractor's lay down area.*

Question 3: Is the intent to replace all of the roofs?

Answer 3: Yes.

Question 4: Clarify if all contractors are bidding the mechanical scope of work and mechanical equipment identified on the equipment schedule included in the bid documents.

Answer 4: Yes.

Question 5: We suspect that there is plywood under the low-slope TPO roof between buildings 4 and 6. Is it known whether the roof decking is compromised and is there a known quantity for this damaged area?

Answer 5: No, the extent of damage is unknown. The area will only be confirmed once the temporary TPO is removed. Replacement of damaged decking will be handled by unit price.

Question 6: Is the contractor responsible for replacing insulation above the ceiling?

Answer 6: At the time of the meeting the answer was unknown. However, the architect walked the project and determined that insulation does exist above ACT ceilings. Above ceiling insulation is to be provided above all **replaced** ACT ceilings.

Question 7: Are ceiling grids being replaced?

Answer 7: Ceiling grids are not called to be replaced. However, if the contractor damages ceiling grids during removal and replacement of tiles and above ceiling insulation they will be replaced at the contractor's expense.

Question 8: Is the contractor responsible for moving furniture?

Answer 8: Yes, the contractor is responsible for moving and protecting all existing furniture. All personal items will be removed by the owner prior to the classroom or space being turned over to the contractor. Additionally, wall hung components (markerboard, tackboards, etc..) are to be removed by the contractor prior to placing any wall repairs or paint.

Question 9: There are varying degrees of damage seen in the photos of Floor Plan Key Note #20 (Repair crack in CMU wall). We would like guidance as to the extent of the repairs for the cracks. Are we to simply repoint the mortar? Maybe use an elastomeric caulk to prevent future cracking if there is slight movement in the structure? Also, will the repairs be done to the ceiling height, or will we need to remove sections of the ceiling to repair the cracks that propagated above the ceiling?

Answer 9: The repair method for CMU joints will be addressed by future addendum.

**The preceding notes were taken from the memory of the writer, any corrections or clarifications shall be brought to the attention of the Architect within 48 hours of circulation of same as the project is proceeding on the basis of the above.**

If your name and contact information is written legibly, you will receive a copy of the meeting notes.

NAME & TITLE

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If your name and contact information is written legibly, you will receive a copy of the meeting notes.

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If your name and contact information is written legibly, you will receive a copy of the meeting notes.

NAME & TITLE

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If your name and contact information is written legibly, you will receive a copy of the meeting notes.

NAME & TITLE

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If your name and contact information is written legibly, you will receive a copy of the meeting notes.

NAME & TITLE

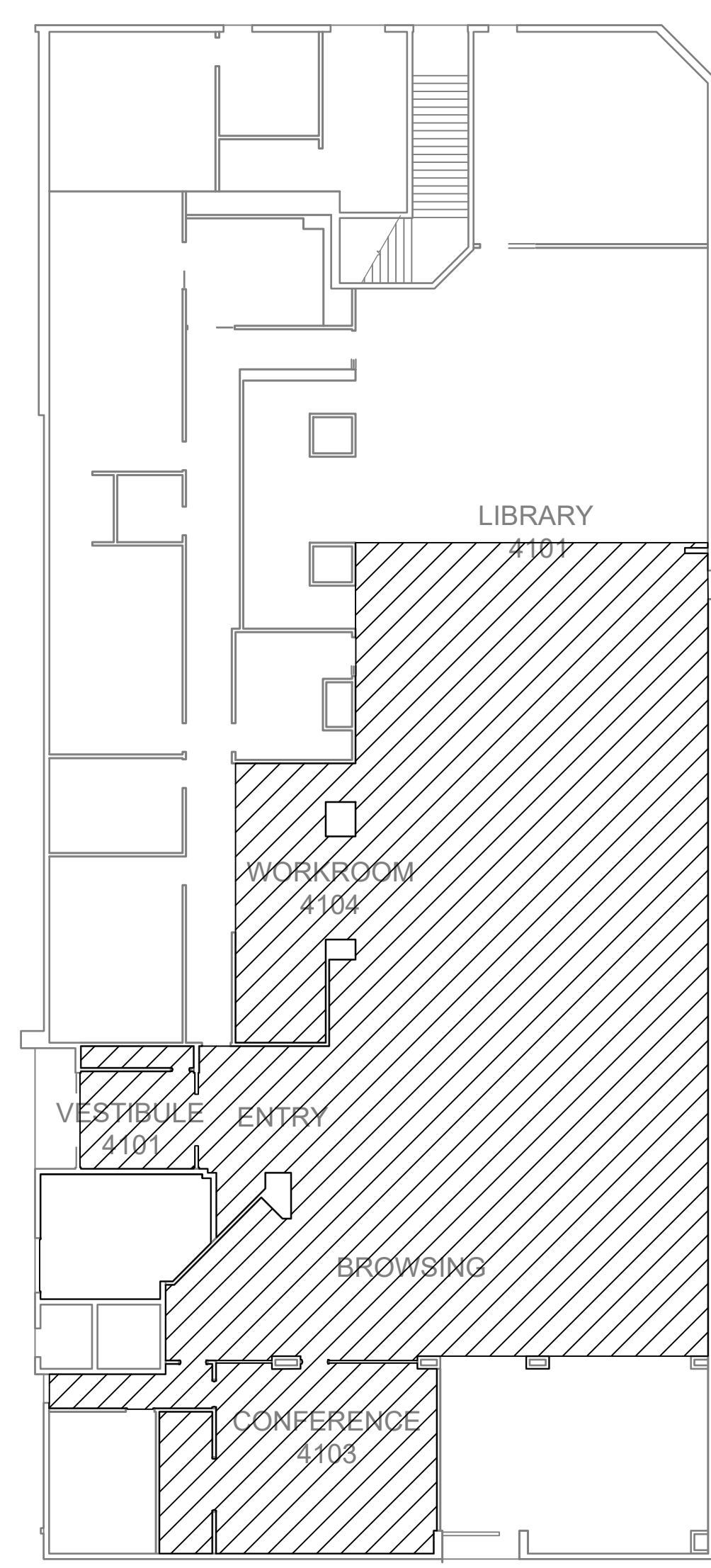
COMPANY NAME & MAILING ADDRESS

PHONE NUMBERS & E-MAIL

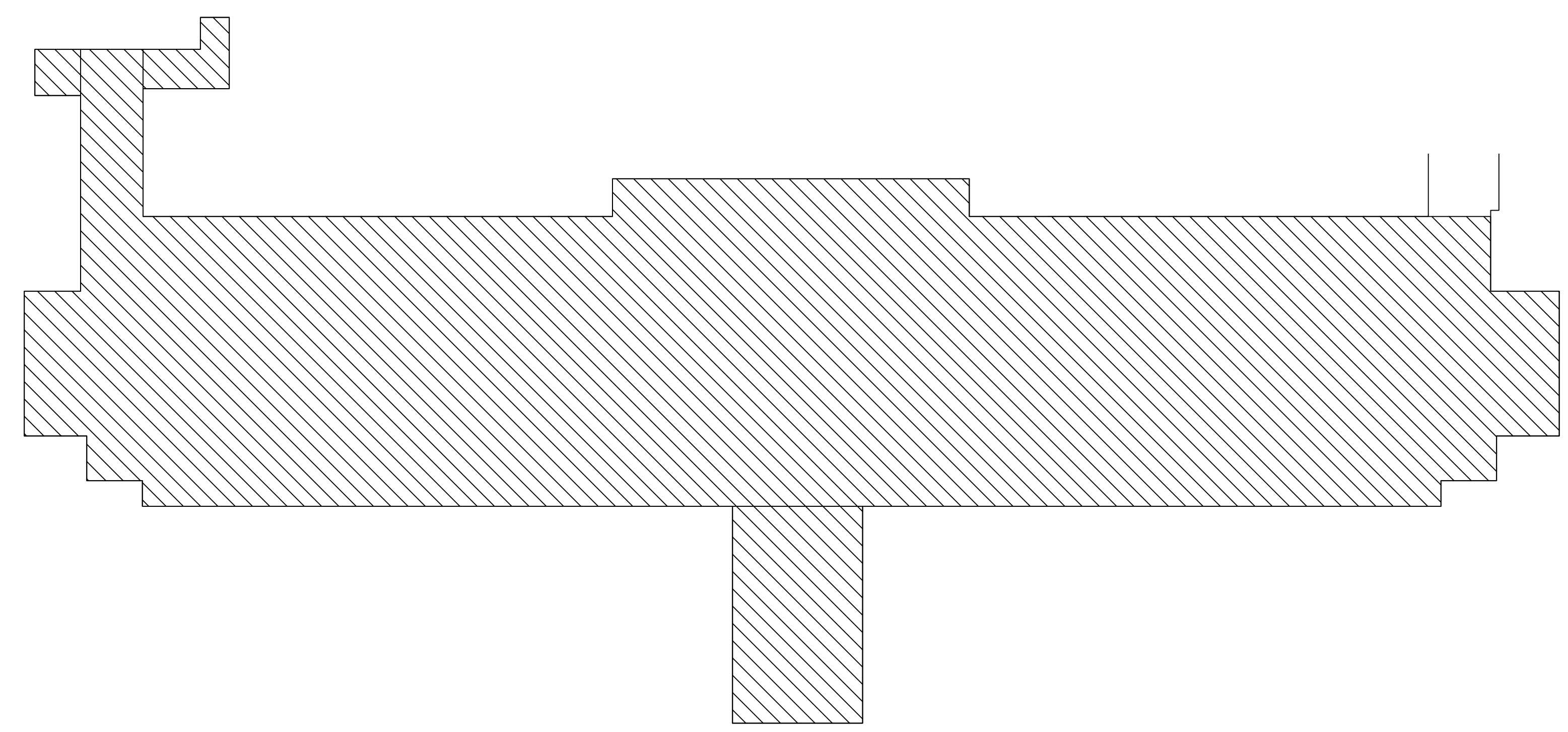
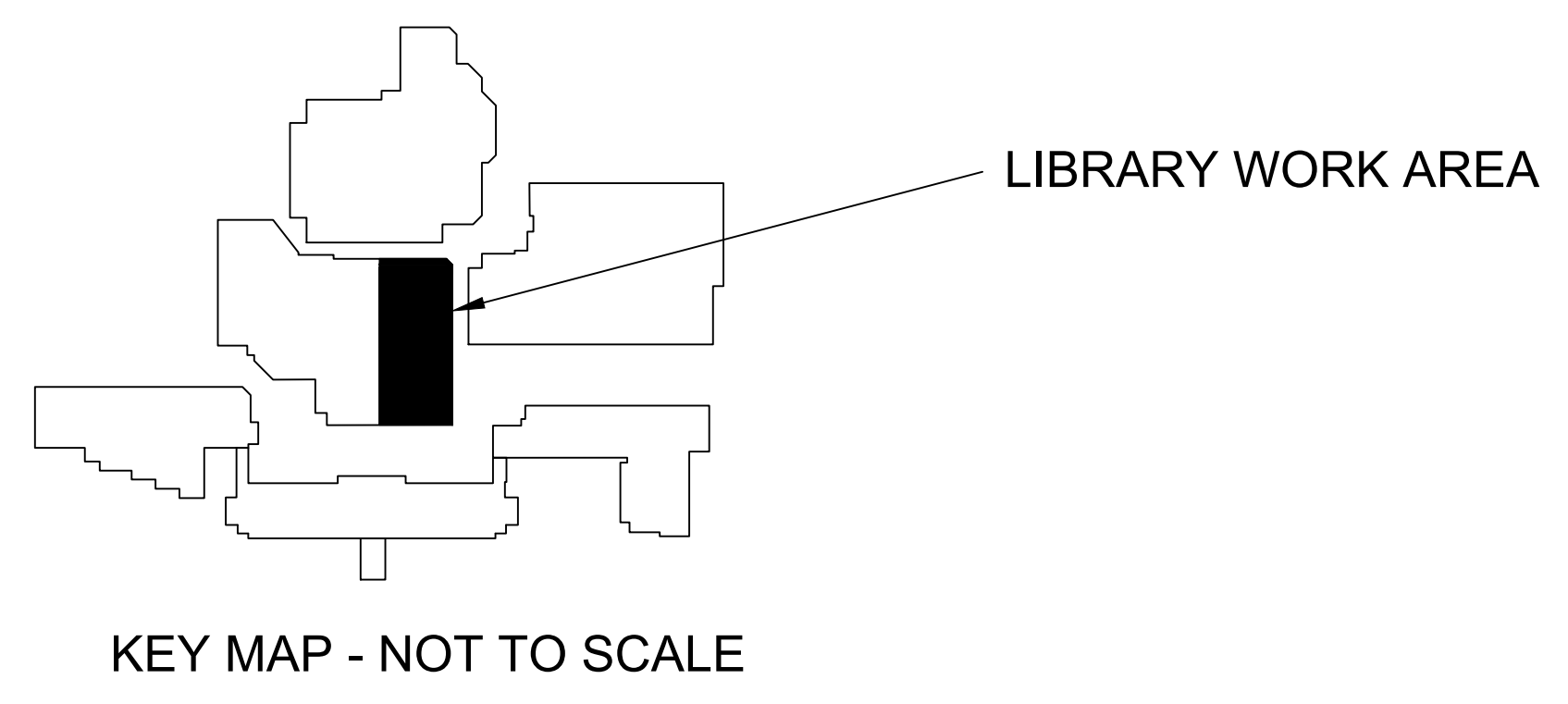
<p>Jordan Guillotte Project Manager</p>	<p>Trahan Construction LLC PO 555 Lake Arthur, LA 70549</p>	<p>Office: (337) 774-3600 Fax: _____ Cell: (337) 250-2761 Email: jordan@trahanconstruction.com</p>
<p>Kate Trahan Vice President</p>	<p>Trahan Construction P.O. BOX 555 Lake Arthur, LA 70549</p>	<p>Office: 887-774-3600 Fax: 337-774-8607 Cell: _____ Email: Kate@trahanconstruction.com</p>
<p>Mark Raymond</p>	<p>ADG ENGINEERING</p>	<p>Office: (337) 234-5710 Fax: _____ Cell: _____ Email: _____</p>
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<p>Scott Schneider</p>	<p>CARLAND Co</p>	<p>Office: _____ Fax: _____ Cell: 225 266 5179 Email: sschneiderwind@carland.com</p>



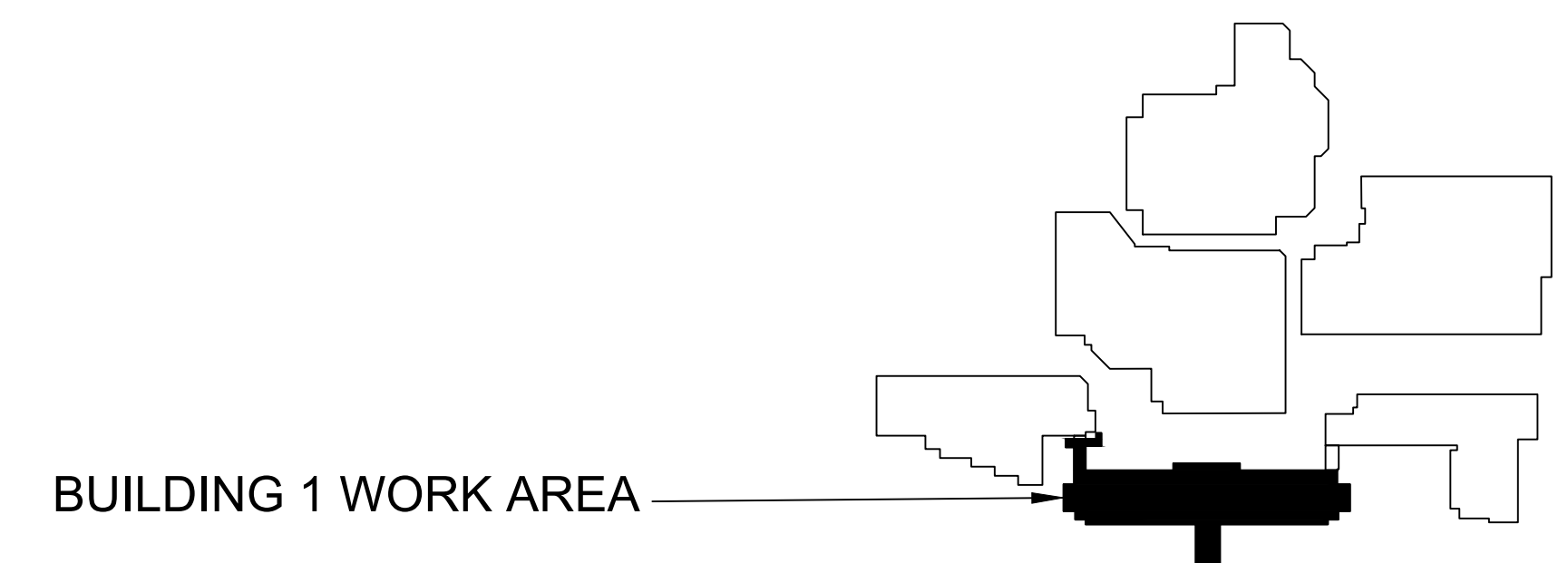
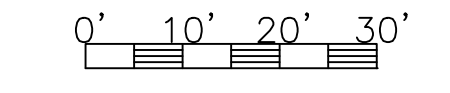
REVISION#	DATE	BY
1	9/28	JLY



**LIBRARY ABATEMENT PLAN**  
 0' 8' 16' 24'



**BUILDING 1 ROOF ABATEMENT PLAN**



**KEY MAP - NOT TO SCALE**

CONTRACTOR SHALL MOVE LIBRARY SHELVES TO OWNER DESIGNATED STORAGE LOCATION. SHELVES ON EXTERIOR WALLS SHALL REMAIN IN PLACE. COORDINATE WITH OWNER AND ENGINEER.

CONTRACTOR SHALL VERIFY BUILDING ONE ROOF WORK AREA EXTENTS WITH ENGINEER AND GENERAL CONTRACTOR.

 REMOVE ROOF MATERIALS. COORDINATE WITH GENERAL CONTRACTOR.

 REMOVE FLOOR TILE / MASTIC

INTENDED PLOT SIZE: D  
 REFER TO LACHIN ARCHITECTS PLAN SHEETS A001 AND A104.  
 CONTRACTOR SHALL FIELD VERIFY ALL QUANTITIES AND CONDITIONS.



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◆ THIS DRAWING IS APPROVED FOR CONSTRUCTION  
 ◇ THIS DRAWING IS NOT APPROVED FOR CONSTRUCTION



# CALCASIEU PARISH SCHOOL BOARD

## SPECIFICATIONS AND CONTRACT DOCUMENTS FOR ASBESTOS ABATEMENT AT SULPHUR HIGH SCHOOL HL-052-01

SEPTEMBER 2023

Project Number  
20046



Wynn L. White Consulting Engineers, Inc.

PO Box 83527

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**POST PROJECT SUBMITTAL PACKAGE**

ASBESTOS ABATEMENT PROJECT NAME: \_\_\_\_\_

\_\_\_\_\_

SCHOOL NAME: \_\_\_\_\_

CONTRACTOR LICENSE DATA & ACCREDITATION: \_\_\_\_\_

\_\_\_\_\_

SUPERVISOR'S ACCREDITATION: \_\_\_\_\_

WORKER ACCREDITATION: \_\_\_\_\_

WORKER SIGN-IN SHEETS: \_\_\_\_\_

DAILY PROJECT LOG: \_\_\_\_\_

ADVF: \_\_\_\_\_

WORK AREA VISUAL INSPECTION CERTIFICATION: \_\_\_\_\_

ABATEMENT CONTRACTOR PERSONAL AIR SAMPLING DATA: \_\_\_\_\_

DATES OF PROJECT: \_\_\_\_\_

QUANTITIES & TYPE OF ACM REMOVED: \_\_\_\_\_

NOTE: The Contractor shall submit this package along with Final application for payment.

Calcasieu Parish School Board shall process the final Application for payment upon receipt of the complete Package.

**SECTION 02 80 10 - SUMMARY OF THE WORK**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The contract and other Division 2 sections apply to this section.

**1.2 WORK COVERED BY CONTRACT DOCUMENTS**

**A. Work areas are shown on the project plans.**

Contractor shall remove to the substrate, handle, and dispose of all carpet, floor tile/mastic, floor glue, floor adhesive, floor patch, and floor filler/leveling compound, and Building 1 roof flashing and roof field materials as Class I Asbestos Containing Materials in work areas shown on drawings.

Contractor shall remove, salvage, and store as directed by Owner all library book shelves as required to access library work area floor tile/mastic. Contractor shall clean and decontaminate all work areas.

The work areas shown may contain multiple layers of carpet, flooring, and floor tile/mastic.

Contractor shall include all exploratory demolition to access ACM in his bid.

- B. **Contract Documents****, dated September 2023 were prepared by Wynn L. White Consulting Engineers, Inc., 17485 Opportunity Drive, Baton Rouge, LA 70817.

**1.3 ASBESTOS CONTAINING MATERIALS:**

- A. **The Work**** of this contract involves activities that will disturb asbestos and presumed asbestos-containing materials (PACM). The location of these materials known to be present at the worksite is set forth in the contract documents. If any other of these materials is found, notify the owner and Engineer about the location and quantity of these materials within 24 hours of the discovery.

**1.4 ASBESTOS HEALTH RISK:**

- A.** The disturbance or dislocation of ACM may cause asbestos fibers to be released into the building's atmosphere, thereby creating a potential health risk to workers and building occupants. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the risk and of proper work procedures that must be followed.
- B.** Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified ACM, take appropriate continuous measures as necessary to protect all building occupants from the risk of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

**1.5 CONTRACTOR USE OF PREMISES**

- A. **Use of the Site:**** Limit use of the premises to work in areas indicated. Confine operations to areas within

contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. **Owner Occupancy:** Coordinate with Owner to allow for Owner occupancy of areas not involved in the work under this contract, or work areas under this contract that have been completed and are ready for release to the Owner.
  2. **Driveways and Entrances:** Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Coordinate use of these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment onsite.
- B. Use of the Existing Building:** Maintain the existing building and jobsite in a secure condition throughout the construction period. Take all precautions necessary to secure the existing building and jobsite during the construction period.
1. **Smoking:** Smoking or open fires will not be permitted within the building enclosure or on the premises.
  2. **Toilet Rooms:** use of existing toilets within the building by the Contractor's personnel will not be permitted.

#### 1.6 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy:** The Owner may occupy the site during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and maintain site security. Perform the Work so as not to interfere with the Owner's operations.
- B. Partial Owner Occupancy:** The Owner reserves the right to occupy completed areas of the site prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

#### 1.7 AIR MONITORING BY THE OWNER:

- A. The Owner shall contract for air monitoring.** Air monitoring shall be conducted both outside and inside of the work area during the work, and for clearance sampling at the end of the project
1. **Outside of the Work Area:** The Owner's air monitoring firm may sample air outside of the work area to detect faults in the work area isolation such as:
    - a. Contamination of the building outside of the work area with airborne asbestos fibers.
    - b. Failure of filtration or rupture in the differential pressure system,
    - c. Contamination of air outside the building envelope with airborne asbestos fibers.
  2. **Inside the Work Area:** The Owner's air monitoring firm may monitor airborne fiber counts in the Work Area. The purpose of this air monitoring is to detect airborne asbestos concentrations that may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.
- B. Work area clearance:** Clearance air sampling by the Owner's air monitoring firm at the completion of asbestos abatement work is described in Section "Project Decontamination".
- C. Air monitoring** required by OSHA is work of the Contractor and is not covered in this section.

1.8 SCHEDULE OF AIR SAMPLES BY OWNER:

A. **Sample cassettes:** Samples will be collected on 25 mm. cassettes as follows:

1. **PCM:** 0.8 micrometer mixed cellulose ester.
2. **TEM:** 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

B. **Number and Volume of Samples:** The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner may vary depending upon job conditions and the analytical method used.

C. **Sample Volume and Sensitivity:**

1. **PCM:** The sample volumes collected by the Owner's air monitoring firm will be determined by the following formula:

$$Volume = \frac{\left( \frac{Number\ of\ Fibers}{Area\ of\ 100\ fields} \right) \times Total\ Filter\ Area}{\left( \frac{Limit\ Value}{4} \right)}$$

Where:

- Number of fibers = 5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm<sup>2</sup> on the filter
- Area of 100 fields = 0.785mm<sup>2</sup>
- Total Filter Area = 385mm<sup>2</sup>
- Limit Value = as specified in the schedules of samples below

- a. For purposes of this specification, the sample volume calculated above will be considered to be of sufficient size so that there is a 95% level of confidence that the value measured by each individual sample at the limit of detection (LOD) is less than or equal to the limit values specified below.
- b. For purposes of this specification, the Limit of Detection (LOD) is defined as 7 fibers/mm<sup>2</sup> on the filter or 5 fibers/100 fields.
- c. For purposes of this specification overloaded samples will be considered as exceeding the applicable limit value.

2. **TEM:** Analytical Sensitivity of 0.005 structures/cc as set forth in the AHERA regulation.

D. **Not Used**

E. **Daily:**

1. **From start of work** of Section "Temporary Enclosures" through the work of Section "Project Decontamination", the Owner may take samples.
2. **Sample volume and sensitivity:** inside the work area may vary depending upon conditions in the work area. If samples are overloaded at the sample volume required for a limit value equal to the "Stop Action Levels" or "Immediate Stop Action Levels" given later in this section, the level is

considered to have been exceeded.

### 3. PCM Samples:

Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume (Liters)	Rate (LPM)
Each Work Area	1	0.1	100	1-10
Outside Each Work Area at Critical Barrier	1	0.01	1,000	1-10
Clean Room	1	0.01	1,000	1-10
Equipment Decon	1	0.01	1,000	1-10
Outside Building	1	0.01	1,000	1-10
Output of Pressure Differential System	1	0.01	1,000	1-10

- F. **Additional samples** may be taken at Owner's or Designer's discretion. If airborne fiber counts exceed allowed limits additional samples may be taken as necessary to monitor fiber levels.

#### 1.9 ANALYTICAL METHODS USED BY THE OWNER:

- A. The following methods will be used by The Owner in analyzing filters used to collect air samples. Sampling rates may be varied from printed standards to allow for high volume sampling.
1. Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.
  2. Transmission Electron Microscopy (TEM) will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

#### 1.10 LABORATORY TESTING BY OWNER:

- A. **The services of a testing laboratory** will be employed by the Owner to perform laboratory analyses of the air samples. A microscope and technician will be set up at the job site, or samples will be sent overnight on a daily basis, so that verbal reports on air samples can be obtained within 24 hours. If on-site analysis is performed, the air sampling and analysis firm employed by the Owner shall participate in the Proficiency Analytical Testing (PAT) program administered by the American Industrial Hygiene Association (AIHA).
- B. **The Contractor will have access** to all air monitoring tests and results upon written request.
- C. **Written Reports:** of all air monitoring tests will be made available to the Contractor upon written request.

#### 1.11 FIBERS AND STRUCTURES

- A. **Fibers Counted:** The following procedure will be used to resolve any disputes regarding fiber types when a project has been stopped due to excessive airborne fiber counts.

1. **Large Fibers:** "Airborne Fibers" referred to above include all fibers regardless of composition as counted by phase contrast microscopy (PCM), unless additional analysis by transmission or scanning electron microscopy demonstrates to the satisfaction of the Designer that non-asbestos fibers are being counted. "Airborne Fibers" counted in samples analyzed by transmission electron microscopy shall be asbestos fibers, greater than 5 microns in length. For purposes of stop action levels, subsequent to analysis by electron microscopy, the number of "Airborne Fibers" shall be determined by multiplying the number of fibers, regardless of composition, counted by PCM by the proportion of fibers that are asbestos as determined by TEM (a number equal to, asbestos fibers counted, divided by all fibers counted in the electron microscopy analysis).
2. **Small Structures:** "Airborne Fibers" referred to above include asbestos structures (fibers, bundles, clusters or matrices) of any diameter and any length greater than 0.5 microns.

**1.12 ADDITIONAL TESTING:**

- A. **The Contractor may conduct** air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner.

**1.13 PERSONAL MONITORING:**

- A. **Owner will not perform** air monitoring for the Contractor to meet Contractor's OSHA requirements for personal sampling or any other purpose.

**PART 2 - PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION**

**3.1 STOP ACTION LEVELS:**

- B. **Asbestos samples Inside Work Area:** Maintain an average airborne count in the work area of less than the Stop Action Level given below for the type of respiratory protection in use. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8 hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify Designer. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Designer.

STOP ACTION LEVEL (f/cc)	IMMEDIATELY STOP LEVEL (f/cc)	MINIMUM RESPIRATOR REQUIRED	PROTECTION FACTOR
0.1	0.5	Half face	10
0.5	2.5	PAPR	50
1.0	5.0	Supplied Air	100



1. If airborne fiber counts exceed Immediate Stop Level given above for type of respiratory protection in use for any period of time cease all work except corrective action. Notify Designer. Do not recommence work until fiber counts fall below Stop Action Level given above for the type of respiratory protection in use. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Designer.

**B. Outside Work Area:** If any air sample taken outside of the Work Area exceeds 0.01 f/cc, immediately and automatically stop all work except corrective action. The Designer will determine the source of the high reading and so notify the Contractor in writing.

1. If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:
  - a. Immediately erect new critical barriers as set forth in Section "Temporary Enclosures" to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor).
  - b. Decontaminate the affected area in accordance with Section "Project Decontamination".
  - c. Require that respiratory protection as set forth in Section "Respiratory Protection" be worn in affected area until area is cleared for re-occupancy in accordance with Section "Project Decontamination".
  - d. Leave Critical Barriers in place until completion of work and ensure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.
  - e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a Shower Room and Changing Room as set forth in Section "Decontamination Units" at entry point to affected area.
  - f. After Certification of Visual Inspection in the Work Area remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Section "Project Decontamination".
2. If the high reading was the result of other causes initiate corrective action as determined by the Designer.

**C. Effect on Contract Sum:** Complete corrective work with no change in the Contract Sum if high airborne fiber counts were caused by Contractor's activities. The Contract Sum and schedule will be adjusted for additional work caused by high airborne fiber counts beyond the Contractor's control.

### 3.2 STOP WORK:

**A. If the Owner, Designer, or Project Administrator** presents a written stop work order, immediately and automatically conforms to that stop work order, while maintaining temporary enclosures and pressure differential. Do not recommence abatement work until authorized in writing by Owner, Designer or Project Administrator.

**B. Immediately initiate the following actions:** After being presented with a stop work order immediately:

1. Cease all asbestos removal activities, or any other activities that disturbs ACM.

2. Repair any fallen, ripped or otherwise failed work area isolation measures.
  3. Maintain in operation all work area isolation measures including those required by Sections "Temporary Enclosures," "Temporary Pressure Differential & Air Circulation System," "Decontamination Units."
  4. Maintain all worker protections including those required by Sections "Worker Protection - Asbestos Abatement," and "Respiratory Protection."
  5. Fog the air in the work area with a mist of amended water to reduce airborne fiber levels.
- C. Do not recommence work** until authorized in writing by the Owner or Designer.

**END OF SECTION – 02 80 10**

## Section 02 80 15

### Coordination

Specifications

02 80 15-1

## SECTION 02 80 15 - COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. **This Section includes** administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Plan of Action.
4. Contingency Plan.
5. Project Directory.
6. Notifications.
7. Pre-Construction Inspection.
8. Contractor's Construction Schedule.
9. Administrative and supervisory personnel.
10. Pre-Construction Conference
11. Progress Meetings
12. Coordination meetings.
13. Record Keeping.
14. Special Reports.

- B. **Related Sections:** The following Sections contain requirements that relate to this Section:

1. "Section Submittals - Asbestos Abatement" for administrative procedures regarding submittals.
2. "Section Materials and Equipment - Asbestos Abatement" for coordinating general installation.
3. "Section Project Closeout - Asbestos Abatement" for coordinating contract closeout.

#### 1.3 COORDINATION

- A. **Owner Occupancy:** Coordinate construction operations and scheduling with partial occupancy requirements of the Owner and the Owner's use of utilities.

- B. **Coordinate construction operations** included in various Sections of these Specifications to assure efficient and orderly completion of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the sequence required to obtain the best results where execution of one part of the Work depends on execution of other components, before or after its own execution.
2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
3. Make provisions to accommodate items scheduled for later installation.

- C. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

## Section 02 80 15

### Coordination

Specifications

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- D. Administrative Procedures:** Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of schedules.
  2. Installation and removal of temporary facilities.
  3. Delivery and processing of submittals.
  4. Progress meetings.
  5. Project closeout activities.
- E. Conservation:** Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

#### 1.4 PLAN OF ACTION:

- A. Prepare a detailed plan** of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination areas, the sequencing of asbestos work, the interface of trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, and a detailed description of the methods to be employed to control pollution. Expand upon the use of portable HEPA ventilation system, closing out of the building's HVAC system, maintaining required temperature and relative humidity inside the work area, method of removal to prohibit visible emissions, and packaging of removed asbestos debris.
1. Submit the Plan of Action to the Designer for information only, prior to the start of work.

#### 1.5 CONTINGENCY PLAN:

- A. Contingency Plan:** Prepare a contingency plan for emergencies or any other event that may require breaching of work area containment or modification or abridgement of decontamination or work area isolation procedures. Include in this plan procedures for performing electrical and mechanical repairs inside containment after abatement work has begun. Include in plan specific procedures for decontamination or work area isolation. Include in plan measures to comply with Interim Life Safety Measures listed below. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Items to be addressed in the plan include, but are not limited to the following:
1. Fire
  2. Accident
  3. Life threatening injury
  4. Non-life threatening injury
  5. Rescue
  6. Power Failure
  7. Pressure differential system failure
  8. Breach of containment
  9. Electrical faults or shock
  10. Excessive heat / cold (if/when such limits are specified)
  11. Supplied air system failure
  12. Water leaks
  13. Waste spills
  14. Unauthorized entry into work area
  15. Elevated air samples outside of containment

## Section 02 80 15

### Coordination

Specifications

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16. Repairs inside containment
17. Toxic releases

#### INTERIM LIFE SAFETY MEASURES:

1. Contractor shall ensure exits provide free and unobstructed egress. Personnel shall receive training if alternate exits must be designated.
2. Contractor shall ensure free and unobstructed access to emergency department/services and for emergency forces.
3. Contractor shall ensure fire alarm detection and suppression systems are not impaired. A temporary, equivalent, system shall be provided when any fire system is impaired. Temporary system must be inspected and tested monthly.
4. Contractor shall ensure temporary construction partitions are smoke tight and built of noncombustible materials.
5. Contractor shall provide additional firefighting equipment and use training for personnel.
6. No smoking within the building is allowed by contractors.
7. Contractor shall develop and enforce storage, housekeeping and debris removal procedures that reduce the flammable and combustible fire load to the lowest level necessary for daily operations.
8. Contractor shall conduct minimum of two (2) fire drills per shift per quarter in the affected areas.
9. Contractor shall increase surveillance hazard of buildings, grounds and equipment with special attention construction areas, construction storage and excavations.
10. Contractor shall train personnel when structural or compartmentation features of fire safety are compromised.
11. Contractor shall conduct organization-wide safety education programs to ensure awareness of any *Life Safety Code* deficiencies and construction hazards for the INTERIM LIFE SAFETY MEASURES.

#### 1.6 PROJECT DIRECTORY

- A. **Develop a directory** of all entities involved in the project. Include the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site. Identify individuals, their duties and responsibilities. List business name, contact person, normal business and emergency telephone, pager and fax numbers and addresses of:
  1. Owner, Designer, and Project Administrator
  2. Contractor's General Superintendent, supervisory personnel and Contractor's home office
  3. Emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company.
  4. Local, state, and federal agencies with jurisdiction over the project.
- B. **Post:** Post copies of the Project Directory in the project meeting room, the temporary field office, each temporary telephone, and at entrance to clean room of Personnel Decontamination Unit.

#### 1.7 NOTIFICATIONS

- A. **Notify other entities** at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials (ACM), requirements relative to asbestos set forth in these specifications and

## Section 02 80 15

### Coordination

Specifications

02 80 15-4

applicable regulations. Advance notification will be made to:

1. Owners of the building/facility;
  2. Employees who will perform asbestos abatement work or related activities, or who will be in the work area during the course of the work of this contract.
  3. Employers of employees who work and/or will be working in adjacent areas during the course of the work of this contract.
- B. Notify emergency service agencies** including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations, modifications to fire notification or fire fighting equipment, and other information needed by agencies providing emergency services.
- C. Notifications of Emergency:** Any individual at the job site may notify emergency service agencies if necessary without effect on this Contract or the Contract Sum.

#### 1.8 PRE-CONSTRUCTION INSPECTION:

- A. Inspect areas** in which work will be performed, prior to commencement of work. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit to Designer for record purposes prior to starting work.

#### 1.9 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule:** Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 3 days after the date established for "Commencement of the Work."
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.
  2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
  3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
  4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
  5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
  6. Indicate Clearance of each Work Area in advance of the dates established for Clearance. Allow time for testing and other Designer's procedures necessary for certification of Clearance.
  7. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Designer's procedures necessary for certification of Substantial Completion.
  8. Indicate completion and Clearance of each Work Area in advance of the date established for Substantial Completion. Allow time for testing and other Designer's procedures necessary for certification of Clearance and Substantial Completion.
- B. Phasing:** On the schedule, show how requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner affect the sequence of Work.
- C. Work Stages:** Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.
1. Non-asbestos demolitions.

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2. Preparation of the Work Area.
  3. Asbestos removal.
  4. Clearance testing.
  5. Substantial Completion.
- D. Area Separations:** Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation:** At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.
- F. Distribution:** Following response to the initial submittal, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- G. Schedule Updating:** Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

#### 1.10 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. Project Supervisor:** Provide a full-time Project Supervisor at the work site who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, project scheduling, management, etc. This person is the Contractor's Representative, and will function as the 'competent person' at the work site responsible for compliance with all applicable federal, state and local regulations, particularly those relating to ACM.
1. **Training:** The General Superintendent must have a current certification from a state approved trainer for a course that meets the requirements of the EPA Model Accreditation Plan for asbestos abatement contractor/supervisor (40 CFR part 763, Subpart E, Appendix C).
  2. **Experience:** The General Superintendent must have demonstrable experience in the successful management of asbestos abatement projects that are similar to the work of this contract.
    - a. The General Superintendent must have a minimum of two (2) years' experience in the on-site management of asbestos abatement projects.
    - b. The General Superintendent must have had responsible charge of a minimum of ten (10) asbestos abatement projects similar in size and type to the work of this contract.
  3. **Competent Person:** The General Superintendent is to be a Competent Person as required by OSHA in 29 CFR 1926.
- B. Supervisors / Forepersons:** Provide full-time Supervisors / Forepersons who are experienced in the supervision of asbestos abatement work areas including work practices, building and personnel, disposal practices, etc. These persons are contractor employees directly responsible to the General Superintendent.
- C. Accreditation:** The General Superintendent, Supervisors and Forepersons are to be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C.

**1.11 PRE-CONSTRUCTION CONFERENCE:**

- A. An initial progress meeting**, recognized as "Pre-Construction Conference" will be convened by the Designer prior to start of any work. The preconstruction conference will be scheduled before start of construction, at a time convenient to the Owner and the Designer. Meet at the project site, or as otherwise directed, with General Superintendent, Owner, Designer, Project Administrator, and other entities concerned with the asbestos abatement work.
- B. Attendees:** Authorized representatives of the Owner, Designer, and their consultants will be in attendance. An authorized representative of the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
1. 72 hours' advance notice will be provided to all participants prior to convening Pre-Construction Conference.
- C. Agenda:** This is an organizational meeting, to review responsibilities and personnel assignments, to locate regulated areas and temporary facilities including power, light, water, etc. Items of significance that could affect progress will be discussed, including the following:
1. Tentative construction schedule.
  2. Critical work sequencing.
  3. Designation of responsible personnel.
  4. Procedures for processing field decisions and Change Orders.
  5. Procedures for processing Applications for Payment.
  6. Distribution of Contract Documents.
  7. Submittal of Shop Drawings, Product Data, and Samples.
  8. Preparation of record documents.
  9. Use of the premises.
  10. Parking availability.
  11. Office, work, and storage areas.
  12. Equipment deliveries and priorities.
  13. Safety procedures.
  14. First aid.
  15. Security.
  16. Housekeeping.
  17. Working hours.

**1.12 PROGRESS MEETINGS:**

- A. General:** In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, the Designer will hold general progress meetings as required. These meeting will be scheduled, where possible, at time of preparation of payment request.
- B. Attendees:** Representatives of the Owner and Designer will attend these meetings. In addition to representatives of the Contractor, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting.
- C. Agenda:** Be prepared to discuss the following items at the progress meetings. Review other items of significance that could affect progress.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind



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schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:

- a. Interface requirements.
- b. Time.
- c. Sequences.
- d. Status of submittals.
- e. Deliveries.
- f. Access.
- g. Site utilization.
- h. Temporary facilities and services.
- i. Hours of work.
- j. Hazards and risks.
- k. Housekeeping.
- l. Quality and work standards.
- m. Change Orders.
- n. Documentation of information for payment requests.

- D. **Reporting:** Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule no later than 3 days after each meeting. Include a brief summary, in narrative form, of progress since the previous meeting and report.

#### 1.13 COORDINATION MEETINGS

- A. **Attend project coordination meetings** that will be conducted as required by the Designer at regular intervals convenient for all parties involved. Project coordination meetings are intended to coordinate the work of all contractors performing work on the site, and are in addition to specific meetings held for other purposes, such as regular progress meetings.

#### 1.14 RECORD KEEPING:

- A. **Daily Log:** Maintain a Daily Log (in an area accessible to the Owner, Designer and Project Administrator) as a bound, sequential, hand-written record carefully prepared daily that documents but is not limited to the following items:

1. Meetings; purpose, attendees, brief discussion
2. Special or unusual events, i.e. barrier breaching, equipment failures, accidents
3. Documentation of Contractor's completion of the following:
  - a. Inspection of work area preparation prior to start of removal and daily thereafter.
  - b. Removal of any sheet plastic barriers.
  - c. Contractor's inspections prior to spray back, lock back, encapsulation, enclosure or any other operation that will conceal the condition of ACM or the substrate from which such materials have been removed.
  - d. Removal of waste materials from work area.
  - e. Decontamination of equipment (list items).
  - f. Contractors final inspection/final air test analysis.

- B. **Entry/Exit Log:** Maintain within the Decontamination Unit a daily log documenting the dates and time of but not limited to, the following items:

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1. Visitations; authorized and unauthorized with the following information
    - a. Name
    - b. Organization
    - c. Entry time
    - d. Exit Time
    - e. Respiratory protection
  2. Personnel, by name, entering and leaving the work area with the following information
    - a. Printed Name
    - b. Identification Number
    - c. Entry Time
    - d. Exit Time
    - e. Respiratory Protection
- C. Air Monitoring Results:** Post personnel and area air monitoring results in Decontamination Unit within 24 hours of sample collection. Post the respiratory protection requirements for the work in progress.
- D. Records in Decontamination Unit:** Maintain the following documentation in the Decontamination Unit, in a location accessible to workers.
1. Documentation of inspections by OSHA, EPA or local authority
  2. Respiratory Protection Program.
- E. Other records:** Maintain other documentation in a location that is accessible to the Owner, Designer, and Project Administrator including:
1. Waste Manifests and shipping records
  2. Landfill receipts.
  3. Accident reports.
- 1.15 SPECIAL REPORTS:**
- A. General:** Except as otherwise indicated, submit special reports directly to Owner within one day of occurrence requiring special report, with copy to Designer and others affected by occurrence.
- B. Reporting Unusual Events:** When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures), prepare and submit report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at earliest possible date.
- C. Reporting Accidents:** Prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury, or where work was stopped for over four hours during a scheduled shift.
- D. Report Discovered Conditions:** When an unusual condition of the building is discovered during the work (e.g. leaks, termites, corrosion) prepare and submit a special report indication condition discovered.
- 1.16 SUBMITTALS**
- A. Before the Start of Work:** Submit the following to the Designer in the same manner as product data. Do not begin work until these submittals are returned with designer's action stamp indicating that all submittals have been "received-not reviewed".

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1. Plan of Action.
  2. Contingency Plans.
  3. Project Directory.
  4. Notifications: copy of notification sent to other entities at the work site, notification sent to Louisiana Department of Environmental Quality, emergency service agencies, and all other notifications as directed by the Owner or Owner's Representative.
  5. Pre-Construction Inspection: Report on inspection carried out as required by this section. Include copies of all photographs, video recordings, etc.
  6. Contractor's Construction Schedule.
  7. Accreditation: Submit evidence in the form of training course certificates for the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors in accordance with AHERA requirements. Submit evidence in the form of training course certificates that each worker is trained as an asbestos abatement worker in accordance with AHERA requirements.
  8. Resume: Submit resume of General Superintendent.
- B. Project Close-out:** Submit two (2) copies for information purposes of all documents indicated in the following sections at final closeout of project as a project close-out submittal.
1. Section on Record Keeping.
  2. Section on Special Reports.

**PART 2 - PRODUCTS** (Not Applicable)

**PART 3 – EXECUTION** (Not Applicable)

**END OF SECTION – 02 80 15**

**SECTION 02 80 21 - REFERENCE STANDARDS AND DEFINITIONS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, and other Division 01 and 02 Specification Sections apply to this Section.

**1.2 DEFINITIONS**

- A. **General:** Basic contract definitions are included in the Conditions of the Contract.
1. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
  2. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Designer, requested by the Designer, and similar phrases.
  3. "Approved": The term "approved," when used in conjunction with the Designer's action on the Contractor's submittals, applications, and requests, is limited to the Designer's duties and responsibilities as stated in the Conditions of the Contract.
  4. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
  5. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
  6. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
  7. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
  8. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
    - a. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
    - b. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

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- c. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
  - 1) This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
9. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
10. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
11. "Designer": This is the entity described as the "Architect" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." All references to Architect or Engineer in the Contract Documents in all cases refer to the Designer. The Designer will represent the Owner during construction and until final payment is due. The Designer will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Designer.
12. "Project Administrator": This is the entity described as the "Project Representative" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon written or verbal order if requirements of the Contract Documents are not met, or if in the sole judgement of the Project Administrator, Designer, or Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.
13. "Stop Work Order": is a written order to cease work activities. The Contractor must maintain work area isolation during the period that a Stop Work Order is in affect.
14. "General Superintendent": This is the Contractor's Representative at the work site. This person must be a Competent Person as defined by OSHA in 29 CFR 1926.
15. "Working Day": Monday through Friday and includes holidays that fall on any of the days Monday through Friday as indicated in the notification requirements.

**1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION**

**A. Specification Format:** These Specifications are organized into Divisions and Sections based on CSI 2004 MasterFormat's numbering system.

**B. Specification Content:** This Specification uses certain conventions regarding the style of language and

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the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. **Abbreviated Language:** Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. **Streamlined Language:** The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

**1.4 INDUSTRY STANDARDS**

- A. **Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.
- C. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Designer before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.
  1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Designer for a decision before proceeding.
- D. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- E. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.
  1. ACI American Concrete Institute  
P.O. Box 19150  
Detroit, MI 48219 (313) 532-2600
  2. ACIL American Council of Independent Laboratories

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- 1629 K St., NW  
Washington, DC 20006 (202) 887-5872
3. ACPA American Concrete Pipe Assoc.  
8300 Boone Blvd., Suite 400  
Vienna, VA 22182 (703) 821-1990
  4. ACGIH American Conference of Governmental Industrial Hygienists  
1330 Kemper Meadow Dr.  
Cincinnati, OH 45240 (513) 742-2020
  5. AIA The American Institute of Architects  
1735 New York Ave., NW  
Washington, DC 20006 (202) 626-7300
  6. AIHA American Industrial Hygiene Assoc.  
2700 Prosperity Ave., Suite 250  
Fairfax, VA 22031 (703) 849-8888
  7. ANSI American National Standards Institute  
11 West 42nd St., 13th Floor  
New York, NY 10036 (212) 642-4900
  8. ASHRAE American Society of Heating,  
Refrigerating and Air-Conditioning Engineers  
1791 Tullie Circle, NE  
Atlanta, GA 30329 (404) 636-8400
  9. ASME American Society of Mechanical Engineers  
345 East 47th St.  
New York, NY 10017 (212) 705-7722
  10. ASPE American Society of Plumbing Engineers  
3617 Thousand Oaks Blvd., Suite 210  
Westlake, CA 91362 (805) 495-7120
  11. ASTM American Society for Testing and Materials  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959 (610) 832-9585
  12. CGA Compressed Gas Assoc.  
1725 Jefferson Davis Highway, Suite 1004  
Arlington, VA 22202-4100 (703) 412-0900
  13. FM Factory Mutual Systems  
1151 Boston-Providence Turnpike  
P.O. Box 9102  
Norwood, MA 02062 (617) 762-4300
  14. GA Gypsum Association  
810 First St., NE, Suite 510  
Washington, DC 20002 (202) 289-5440

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15. IEEE Institute of Electrical and Electronic Engineers  
345 E. 47th St.  
New York, NY 10017 (212) 705-7900
16. IETA International Electrical Testing Assoc.  
P.O. Box 687  
Morrison, CO 80465 (303) 697-8441
17. IRI Industrial Risk Insurers  
P.O. Box 5010  
85 Woodland St.  
Hartford, CT 06102-5010 (203) 520-7300
18. ISA Instrument Society of America  
P.O. Box 12277  
67 Alexander Dr.  
Research Triangle Park, NC 27709 (919) 549-8411
19. ISO International Standards Organization
20. NEC National Electrical Code (from NFPA)
21. NECA National Electrical Contractors Assoc.  
3 Bethesda Metro Center, Suite 1100  
Bethesda, MD 20814 (301) 657-3110
22. NEMA National Electrical Manufacturers Assoc.  
2101 L St., NW, Suite 300  
Washington, DC 20037 (202) 457-8400
23. NFPA National Fire Protection Assoc.  
One Batterymarch Park  
P.O. Box 9101  
Quincy, MA 02269-9101 (617) 770-3000 (800) 344-3555
24. NRCA National Roofing Contractors Assoc.  
10255 W. Higgins Rd., Suite 600  
Rosemont, IL 60018-5607 (708) 299-9070
25. RFCI Resilient Floor Covering Institute  
966 Hungerford Dr., Suite 12-B  
Rockville, MD 20805 (301) 340-8580
26. UL Underwriters Laboratories  
333 Pfingsten Rd.  
Northbrook, IL 60062 (708) 272-8800
27. White Lung Association  
PO Box 1483  
Baltimore, MD 21203



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**E. Federal Government Agencies:** Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard- or Specification-producing agencies of the federal government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

1. CE Corps of Engineers  
(U.S. Department of the Army)  
Chief of Engineers - Referral  
Washington, DC 20314 (202) 272-0660
2. CFR Code of Federal Regulations  
(Available from the Government Printing Office)  
N. Capitol St. between G and H St., NW  
Washington, DC 20402 (202) 783-3238  
(Material is usually first published in the "Federal Register")
3. CPSC Consumer Product Safety Commission  
5401 Westbard Ave.  
Bethesda, MD 20207 (800) 638-2772
4. CS Commercial Standard  
(U.S. Department of Commerce)  
Government Printing Office  
Washington, DC 20402 (202) 783-3238
5. DOC Department of Commerce  
14th St. and Constitution Ave., NW  
Washington, DC 20230 (202) 482-2000
6. DOT Department of Transportation  
400 Seventh St., SW  
Washington, DC 20590 (202) 366-4000
7. EPA Environmental Protection Agency  
401 M St., SW  
Washington, DC 20460 (202) 260-2090
8. FS Federal Specification (from GSA)  
Specifications Unit (WFSIS)  
7th and D St., SW  
Washington, DC 20407 (202) 708-9205
9. GSA General Services Administration  
F St. and 18th St., NW  
Washington, DC 20405 (202) 708-5082
10. MIL Military Standardization Documents  
(U.S. Department of Defense)  
Naval Publications and Forms Center  
5801 Tabor Ave.  
Philadelphia, PA 19120

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11. NIST National Institute of Standards and Technology  
(U.S. Department of Commerce)  
Gaithersburg, MD 20899 (301) 975-2000
12. OSHA Occupational Safety and Health Administration  
(U.S. Department of Labor)  
200 Constitution Ave., NW  
Washington, DC 20210 (202) 219-6091
13. PS Product Standard of NBS  
(U.S. Department of Commerce)  
Government Printing Office  
Washington, DC 20402 (202) 783-3238
14. USPS U.S. Postal Service  
475 L'Enfant Plaza, SW  
Washington, DC 20260-0010 (202) 268-2000
15. Louisiana Department of Environmental Quality  
Office of Environmental Compliance  
P.O. Box 82215  
Baton Rouge, La. 70884-2215 (225) 765-0634

**F. Trade Union Jurisdictions:** The Contractor shall maintain, and require subcontractors to maintain, complete current information on jurisdictional matters, regulations and pending actions, as applicable to construction activities. The manner in which Contract Documents have been organized and subdivided is not intended to be indicative of trade union or jurisdictional agreements.

1. Discuss new developments at project meetings at the earliest feasible dates. Record relevant information and actions agreed upon.
2. Assign and subcontract construction activities, and employ tradesmen and laborers in a manner that will not unduly risk jurisdictional disputes that could result in conflicts, delays, claims and losses.

**PART 2 - PRODUCTS** (Not Applicable)

**PART 3 - EXECUTION** (Not Applicable)

**END OF SECTION 02 80 21**

**SECTION 02 80 22 - CODES, REGULATIONS AND STANDARDS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, and other Division 01 and 02 Specification Sections apply to this section.

**1.2 SUMMARY**

- A. This section sets forth governmental regulations which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.
  - 1. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.
  - 2. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

**1.3 CODES, REGULATIONS AND STANDARDS**

- A. **General Applicability of Codes, Regulations and Standards:** Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes and regulations have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- B. **Contractor Responsibility:** The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Owner and Designer harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the contractor, the contractor's employees, or subcontractors.
- C. **Federal Requirements:** which govern renovation work or hauling and disposal of waste materials include but are not limited to the following:
  - 1. **OSHA:** U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

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- a. Respiratory Protection  
Title 29, Part 1910, Section 134 of the Code of Federal Regulations  
Title 29, Part 1926, Section 103 of the Code of Federal Regulations
  - b. Personal Protective Equipment for General Industry  
Title 29, Part 1910, Section 132 of the Code of Federal Regulations  
Title 29, Part 1926, Sections 95 - 107 of the Code of Federal Regulations
  - c. Access to Employee Exposure and Medical Records  
Title 29, Part 1926, Section 33 of the Code of Federal Regulations
  - d. Hazard Communication  
Title 29, Part 1926, Section 59 of the Code of Federal Regulations
  - e. Specifications for Accident Prevention Signs and Tags  
Title 29, Part 1910, Section 145 of the Code of Federal Regulations
  - f. Permit Required Confined Space  
Title 29, Part 1910, Section 146 of the Code of Federal Regulations
  - g. Construction Industry  
Title 29, Part 1910, Section 1001 of the Code of Federal Regulations  
Title 29, Part 1926, Section 1101 of the Code of Federal Regulations
  - h. Construction Industry - General Duty Standards  
Title 29, Part 1926, Sections 20 through 35 of the Code of Federal Regulations
- 2. DOT:** U. S. Department of Transportation, including but not limited to:
- a. Hazardous Substances  
Title 49, Part 171 and 172 of the Code of Federal Regulations
  - b. Hazardous Material Regulations  
General Awareness and Training Requirements for Handlers, Loaders and Drivers  
Title 49, Parts 171-180 of the Code of Federal Regulations
  - c. Hazardous Material Regulations  
Editorial and Technical Revisions  
Title 49, Parts 171-180 of the Code of Federal Regulations
- 3. EPA:** U. S. Environmental Protection Agency (EPA), including but not limited to:
- a. National Emission Standard for Hazardous Air Pollutants (NESHAP)  
National Emission Standard for Asbestos  
Title 40, Part 61, Sub-part A, and Sub-part M (Revised Sub-part B) of the Code of Federal Regulations
- D. State Requirements:** which govern work or hauling and disposal of asbestos waste materials include but are not limited to the following: LAC 33:III:51 and LAC 33:III:51.

Abide by all local requirements which govern renovation work or hauling and disposal of waste materials.

**1.4 PERMITS:**

Contractor is responsible for obtaining any demolition, building, renovation or other permits, and for paying application fees, if any, where required by State or Local jurisdictions.

**1.5 LICENSES:**

**A.** Licenses: Maintain current licenses as required by applicable state or local jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract.

**1.4 POSTING AND FILING OF REGULATIONS**

**A. Posting and Filing of Regulations:** Post all notices required by applicable federal, state and local regulations. Maintain two (2) copies of applicable federal, state and local regulations and standard. Maintain one copy of each at job site. Keep on file in Contractor's office one copy of each.

**1.5 SUBMITTALS:**

**A. Before Start of Work:** Submit the following to the Designer for review. No work shall begin until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work including:
  - a. State and Local Regulations: Submit copies of codes and regulations applicable to the work.
2. Notices: Submit notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.
3. Permits: Submit copies of current valid permits required by state and local regulations.
4. Licenses: Submit copies of all State and local licenses and permits necessary to carry out the work of this contract.

**PART 2 - PRODUCTS** (Not Applicable)

**PART 3 - EXECUTION** (Not Applicable)

**END OF SECTION – 02 80 22**

## Section 02 80 30

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## SECTION 02 80 30 - SUBMITTALS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:

1. Submittal schedule.
2. Daily construction reports.
3. Shop Drawings.
4. Product Data.
5. Samples.
6. Quality Assurance Submittals

- B. Administrative Submittals: Refer to other Division 2 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. List of Subcontractors

#### C. RELATED SECTIONS

1. The following Sections contain requirements that relate to this Section:
  - a. Section "Coordination" specifies requirements governing submittal and distribution of meeting and conference minutes.
  - b. Section "Project Closeout" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

#### 1.3 SUBMITTAL PROCEDURES

- A. **Coordination:** Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
  - a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

- B. **Processing:** To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

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No extension of Contract Time will be authorized because of failure to transmit submittals to the Designer sufficiently in advance of the Work to permit processing.

- C. Submittal Preparation:** Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
  2. Include the following information on the label for processing and recording action taken.
    - a. Project name.
    - b. Date.
    - c. Name and address of the Designer.
    - d. Name and address of the Contractor.
    - e. Name and address of the supplier.
    - f. Name of the manufacturer.
    - g. Number and title of appropriate Specification Section.
    - h. Drawing number and detail references, as appropriate.
  3. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
  4. Contractor shall transmit all submittals in electronic format (email to Designer or via CD-ROM). Contractor shall use latest version of Microsoft Word, Microsoft Excel, or Adobe PDF file formats for submittal preparation.
- D. Submittal Transmittal:** Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Designer using a transmittal form. The Designer will not accept submittals received from sources other than the Contractor.
1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- E. Transmittal Form:** Use AIA Document G810.

#### 1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule:** After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals.
1. Coordinate Submittal Schedule with the list of products as well as the Contractor's Construction Schedule.
  2. Prepare the schedule in chronological order. Provide the following information:
    - a. Scheduled date for the first submittal.
    - b. Related Section number.
    - c. Submittal category (Shop Drawings, Product Data, or Samples).
    - d. Description of the part of the Work covered.
    - e. Scheduled date for resubmittal.

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- f. Scheduled date for the Designer's final release or approval.
- B. Distribution:** Following response to the initial submittal, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies at the jobsite.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. Schedule Updating:** Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

#### 1.5 SHOP DRAWINGS

- A. Submit** newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.
- B. Shop Drawings** include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:
1. Dimensions.
  2. Identification of products and materials included by sheet and detail number.
  3. Compliance with specified standards.
  4. Notation of coordination requirements.
  5. Notation of dimensions established by field measurement.
- C. Drawing Format and Sheet Size:** Submit Drawings in AutoCad 2009 and Adobe Acrobat compatible format to plot on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 36 by 48 inches (890 by 1220 mm).
- D. Initial Submittal:** Submit one copy for the Designer's review.
- E. Final Submittal:** Submit one copy with closeout documentation.
1. One of the prints returned shall be marked up and maintained as a "Record Document."
  2. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

#### 1.6 PRODUCT DATA

- A. Collect Product Data into a single submittal.** Product Data includes information such as manufacturer's installation instructions, catalog cuts, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
1. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
    - a. Manufacturer's printed recommendations.



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- b. Compliance with recognized trade association standards.
  - c. Compliance with recognized testing agency standards.
  - d. Application of testing agency labels and seals.
  - e. Notation of dimensions verified by field measurement.
  - f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
- B. Preliminary Submittal:** Submit a preliminary single-copy of Product Data where selection of options is required.
- C. Submittals:** Submit 1 electronic copy of each required submittal. The Designer will return the submittal with action taken and corrections or modifications required.
1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
- D. Distribution:** Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
1. Do not proceed with installation until a final submittal is in the installer's possession.
  2. Do not permit use of unmarked copies of Product Data in connection with construction.

#### 1.7 NOT USED

#### 1.8 QUALITY ASSURANCE SUBMITTALS

- A. Submit quality-control submittals,** including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- B. Certifications:** Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
1. **Signature:** Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

#### 1.9 MISCELLANEOUS SUBMITTALS:

- A. Material Safety Data Sheets:** Process material safety data sheets as "product data." These are submitted for information purposes only, they will be returned with the action stamp, "Received - Not Reviewed."
- B. Inspection and Test Reports:** Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.
- C. Worker Identification and Accreditation:** Provide legally recognized identification of contractor personnel

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(such as valid driver's license from any of the fifty states of the United States of America or territories, or valid photographic ID from any of the fifty states of the United States of America or territories) as well as required drug screening and employee background information.

- D. **Project Photographs:** Furnish project photographs at monthly intervals. Comply with Designer's direction concerning desired vantage points for shots.
- E. **Records of Actual Work:** Furnish copies of records of actual work, one of which will be returned for inclusion in the record documents as specified in section "Project Closeout".
- F. **Standards:** Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Designer's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the work.
- G. **Closeout Submittals:** Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information.
- H. **Record Documents:** Furnish set of original documents as maintained on the project site. Along with original marked-up record drawings provide electronic copies of marked-up drawings

#### 1.10 DESIGNER'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Designer will review each submittal, mark to indicate action taken, and return promptly.
  - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. **Action Label:** The Designer will label each submittal with a uniform, action label. The Designer will mark the label appropriately to indicate the action taken, as follows:
  - 1. **Final Unrestricted Release:** When the Designer marks a submittal "Approved," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
  - 2. **Final-But-Restricted Release:** When the Designer marks a submittal "Approved as Noted," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
  - 3. **Returned for Resubmittal:** When the Designer marks a submittal "Not Approved, Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.
    - a. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.
  - 4. **Received - Not Reviewed:** When the Designer marks a submittal "Received - Not Reviewed" this acknowledges that the submittal has been received. This action applies to materials that are to be submitted for information purposes only, and where no review or action by the Designer is required.

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5. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Designer will return the submittal marked "Action Not Required."

**C. Unsolicited Submittals:** The Designer will return unsolicited submittals to the sender without action.

**PART 2 - PRODUCTS** (Not Applicable)

**PART 3 - EXECUTION** (Not Applicable)

**END OF SECTION 02 80 30**

**SECTION 02 80 40 - TEMPORARY FACILITIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions** of the Contract, including General and Supplementary Conditions and other Division 1 & 2 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes requirements** for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection where required.

- B. Temporary utilities include**, but are not limited to, the following:

1. Water service and distribution.
2. Temporary electric power and light.
3. Temporary heat.
4. Ventilation.
5. Telephone service.
5. Sanitary facilities, including drinking water.
6. Storm and sanitary sewer.

- C. Support facilities include**, but are not limited to, the following:

1. Field offices, laboratories, and storage sheds.
2. Temporary enclosures.
3. Hoists and temporary elevator use.

- D. Security and protection facilities include**, but are not limited to, the following:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.

**1.3 DESCRIPTION OF REQUIREMENTS:**

- A. General:** Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.

**1.4 SUBMITTALS**

- A. Before the Start of Work:** Submit the following to the Designer for review. Begin no work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use. Only submit data on items listed below that are required for use on this project.

1. Hot water heater: Submit manufacturers name, model number, size in gallons (liters), heating capacity, power requirements.
2. Decontamination Unit Sub-panel: Submit product data.
3. Ground Fault Circuit Interrupters (GFCI): Submit product data.
4. Lamps and Light Fixtures: Submit product data.

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5. Temporary Heating Units: Provide product data.
6. Temporary Cooling Units: Provide product data and installation instructions.
7. Self Contained Toilet Units: Provide product data and name of sub-contractor to be used for servicing self contained toilets. Submit method to use for servicing.
8. Fire Extinguishers: Provide product data. Submit schedule indicating location at job site and compliance with NFPA 10 and NFPA 241.
9. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
10. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

**1.5 QUALITY ASSURANCE**

- A. Regulations:** Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
1. Building code requirements.
  2. Health and safety regulations.
  3. Utility company regulations.
  4. Police, fire department, and rescue squad rules.
  5. Environmental protection regulations.
- B. Standards:** Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
- C. Electrical Service:** Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
- D. Inspections:** Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

**1.6 PROJECT CONDITIONS**

- A. Temporary Utilities:** Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.
- B. Conditions of Use:** Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

**PART 2 - PRODUCTS**

**2.1 MATERIALS AND EQUIPMENT**

- A. General:** Provide new materials and equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used materials and equipment in serviceable condition. Provide materials and equipment suitable for use intended.

**B. Lumber and Plywood:**

1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
2. For fences and vision barriers, provide minimum 3/8-inch- (9.5mm) thick exterior plywood.

**C. Scaffolding:** Provide scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of scaffolding shall comply with applicable OSHA provisions.

1. Equip rungs of metal ladders, etc. with an abrasive non-slip surface.
2. Provide a nonskid surface on scaffold surfaces subject to foot traffic.

**2.2 WATER SERVICE**

**A. Water:** Provide potable water approved by local health authorities.

**B. Temporary Water Service Connection:** Connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment. Provide separate hoses and/or pumps for shower water and amended water, without the possibility of cross connection.

**C. Water Hoses:** Provide heavy-duty, abrasion-resistant, flexible hoses in diameters and lengths necessary to adequately serve temporary facilities, and with a pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

1. Provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

**D. Hot Water Heater:** Provide UL rated minimum 40 gallon (150 liters) electric hot water heater to supply hot water for the Decontamination Unit shower. Activate from 30 amp circuit breaker located within the Decontamination Unit subpanel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 12" X 12" X 6" (30 cm. X 30 cm. X 15 cm) deep pan, made of 19 gauge galvanized steel, with handles. A 3-quart (3 liter) kitchen saucepan may be substituted for this purpose. Drip pan shall be securely fastened to the hot water heater with bailing wire or similar material. Wiring of the hot water heater shall be in compliance with NEMA, NECA, and UL standards.

**E. Hot Water:** may be secured from the building hot water system, provided backflow protection is installed at point of connection as described in this section under Temporary Water Service connection, and if authorized in writing by the Designer.

**2.3 ELECTRICAL SERVICE:**

**A. General:** Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

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- B. Temporary Power:** Provide service to Decontamination Unit subpanel with minimum 60 amp, 2 pole circuit breaker or fused disconnect connected to the building's main distribution panel. Subpanel and disconnect shall be sized and equipped to accommodate electrical equipment required for completion of the work.
1. Connection to the building's main distribution panel is to be made by a licensed electrician
- C. Voltage Differences:** Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.
- D. Electrical Outlets:** Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters (GFCI), reset button, and pilot light for connection of power tools and equipment.
1. Locate GFCI's exterior to Work Area so that circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.
- E. Electrical Power Cords:** Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- F. Lamps and Light Fixtures:** Provide general service incandescent lamps or fluorescent lamps of wattage indicated or required for adequate illumination as required by the work or this section. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations. Provide vapor tight fixtures in work area and decontamination units. Provide exterior fixtures where fixtures are exposed to the weather or moisture.

**2.4 TEMPORARY HEAT:**

- A. Heating Units:** Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from a branch circuit with ground fault circuit interrupter.

**2.5 TEMPORARY COOLING:**

- A. Cooling Units:** Provide temporary cooling units consisting of a fan coil unit inside the work area with a compressor and heat rejection coil outside.

**2.6 TEMPORARY STRUCTURES**

- A. Temporary Offices:** Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- B. Temporary Toilet Units:** Provide self-contained, single-occupant toilet units of the chemical or aerated recirculation type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester

shell or similar nonabsorbent material.

## 2.7 FIRST AID

- A. **First Aid Supplies:** Comply with governing regulations and recognized recommendations within the construction industry.

## 2.8 FIRE EXTINGUISHERS:

- A. **Fire Extinguishers:** Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
- B. **Comply with NFPA 10 and NFPA 241** for classification, extinguishing agent, and size required by location and class of fire exposure.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. **General:** Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. **Provide** each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
- C. **Require** that personnel accomplishing this work be licensed as required by local authority for the work performed.
- D. **Relocate**, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

### 3.2 SCAFFOLDING:

- A. **During the erection and/or moving** of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged.
- B. **Clean** as necessary debris from non-slip surfaces.
- C. **At the completion of abatement work** clean construction aids within the work area, wrap in one layer of 6 mil (0.15 mm) polyethylene sheet and seal before removal from the Work Area.

### 3.3 TEMPORARY UTILITY INSTALLATION

- A. **General:** Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to



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- make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
  3. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Change Orders.

**B. Water Service:**

1. Water connection (without charge) to Owner's existing potable water system is limited to one 3/4" (19 mm ) pipe-size connection, and a maximum flow of 10 g.p.m. (38 liters / minute) each to hot and cold water supply. Install using vacuum breakers or other backflow preventer as required by local authority. Hot water shall be supplied at a minimum temperature of 100 degrees F (35 degrees C). Supply hot and cold water to the Decontamination Unit in accordance with Section 01563.
  - a. Maintain hose connections and outlet valves in leakproof condition. Where finish work below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. Drain water promptly from pans as it accumulates.
2. Sterilization: Sterilize temporary water piping prior to use.

**C. Electrical Service:**

1. Lock out: Lock out all existing power to or through the work area as described below. Unless specifically noted otherwise existing power and lighting circuits to the Work Area are not to be used. All power and lighting to the Work Area and Decontamination facilities are to be provided from temporary electrical panel described below.
  - a. Comply with requirements to OSHA 29 CFR 1910.147 the control of hazardous energy lock out/tag out.
  - b. Lock out power to Work Area by switching off breakers serving power or lighting circuits in work area. Tagout breakers with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who has locked pane.
  - c. Lock out power to circuits running through Work Area wherever possible by switching off and locking all breakers serving these circuits. Tag out breakers with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to authorized person who has applied locks. If circuits cannot be shut down for any reason, label at intervals of 4-feet" (1.25 meter) on center with signs reading, "DANGER live electric circuit. Electrocution hazard." All asbestos abatement work in the vicinity of the live circuit is to be performed dry. All necessary notifications and procedures for dry removal are to be followed.
  - d. Lock out power to electrical equipment located in the work area, and to any fans or other equipment that is going to be worked on.
2. Temporary Electrical Panel: Provide temporary electrical panel sized and equipped to accommodate electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical system. Protect with circuit breaker or fused disconnect. Locate temporary panel as directed by Owner or Designer. Panel is to be installed by a licenses electrician.
3. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
4. Circuit Protection: Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size

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- located in the temporary panel. Do not use outlet type GFCI devices.
5. Temporary Wiring: in the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide liquid tight enclosures or boxes for wiring devices.
  6. Number of Branch Circuits: Provide sufficient branch circuits as required by the work. Branch circuits are to originate at temporary electrical panel. At minimum provide the following:
    - a. One Circuit for each HEPA filtered fan unit
    - b. For power tools and task lighting, provide one temporary 4-gang outlet in the following locations. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).
    - c. One outlet in the work area for each 2500 square feet (225 square meters) of work area
    - d. One outlet at each decontamination unit, located in equipment room
  7. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's exclusive use while conducting visual inspection and air sampling during the work as follows:
    - a. One in each work area
    - b. One at clean side of each Decontamination Unit.
    - c. One at each exhaust location for HEPA filtered fan units
  8. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's exclusive use for conducting visual inspection and final air sampling as set forth in Section 01711 Project Decontamination as follows:
    - a. Five inside work area
    - b. Two outside work area in location designated by Designer

**D. Temporary Lighting:**

1. Lock out: Lock out existing power to lighting circuits in Work Area as described in section "Temporary Enclosures". Unless specifically noted otherwise existing lighting circuits to the Work Area are not to be used. All lighting to the Work Area and Decontamination facilities is to be provided from temporary electrical panel described above.
2. Provide the following or equivalent where natural lighting or existing building lighting does not meet the required light level:
  - a. One 200-watt incandescent lamp per 1000 square feet (92.9 square meters) of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 50 feet (15.2 meters). In stair ways and at ladder runs, provide one lamp minimum per story, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
  - b. Provide lighting in areas where work is being performed as required to supply a 100 foot candle (1,076 lumens/sq meter) minimum light level.
  - c. Provide lighting in any area being subjected to a visual inspection as required to supply a 100 foot candle (1,076 lumens/sq meter) minimum light level.
  - d. Provide lighting in the Decontamination Unit as required to supply a 50 foot candle (538 lumens/sq meter) minimum light level.
3. Number of Lighting Circuits: Provide sufficient lighting circuits as required by the work. Lighting

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circuits are to originate at temporary electrical panel.

4. **Circuit Protection:** Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel.

**E. Temporary Heat:**

1. **General:** Provide temporary heat where indicated or needed for performance of the Work.
2. **Heating Facilities:** Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP-gas or fuel-oil heaters with individual space thermostatic control.
  - a. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.
3. Maintain a minimum temperature of 70 degrees F (21 degrees C). Where finished work has been installed.
4. Maintain a minimum temperature of 75 degrees F (24 degrees C) in the shower of the decontamination unit.
5. Maintain a minimum temperature of 65 degrees F (18 degrees C) in the Work Area at all times that work is going on. At all other times and at completion of removal work, but before start of reconstruction work, maintain a minimum temperature of 50 degrees F (10 degrees C).
6. Maintain a minimum temperature of 50 degrees F (10 degrees C) in the Work Area at all times during and after removal work.

**F. Temporary Cooling:**

1. **Required Cooling:** Provide units sufficient to supply 20,000 BTU/hr (5,862 w) of cooling per 8,000 cubic feet (225 cubic meters) of work area.

**G. Temporary Utilities**

1. **Temporary Telephones:** Provide temporary telephone service throughout the construction period for personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station. Provide wireless high speed internet connection for Owner's representative, air monitoring and air sample analysis personnel, and Designer's use.
2. **Separate Telephone Lines:** Provide additional telephone lines for the following:
  - a. Where an office has more than 2 occupants, install a telephone for each additional occupant or pair of occupants.
  - b. Provide a dedicated telephone line for a fax machine in the field office.
  - c. Provide a separate line for the Owner's use.
  - d. At each telephone, post a list of emergency telephone numbers.

**H. Sanitary Facilities:**

1. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
  - a. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
2. **Toilets:** Use of the Owner's existing toilet facilities will not be permitted.

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3. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
4. Provide separate facilities for male and female personnel.
5. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
6. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
  - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7.2 to 12.8 deg C).
7. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
  - a. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
  - b. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

**3.4 SUPPORT FACILITIES INSTALLATION**

- A. **Locate field offices**, field laboratories, storage sheds, and other temporary construction and support facilities for easy access. Coordinate location with Owner.
  1. Maintain support facilities until Substantial Completion. Remove prior to Final Completion.
- B. **Provide incombustible construction** for offices, shops, and sheds located within the construction area or within 30 feet (9 m) of building lines. Comply with requirements of NFPA 241.
- C. **Field Offices and Laboratory**: Provide insulated, weather tight temporary offices of sufficient size to accommodate required personnel at the Project Site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
  1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase. Provide adequate work and storage space for personnel conducting Owner's Air Monitoring, including work area for air sample preparation and analysis.
  2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- C. **Storage and Fabrication Sheds**: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.
- D. **Temporary Enclosures**: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
  1. Where heat is needed and the permanent building enclosure is not complete, provide temporary

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- enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood or similar materials.
  3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
  4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

- E. Temporary Lifts and Hoists:** Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

**3.5 FIRE PROTECTION FACILITIES INSTALLATION**

- A. Except for use of permanent fire protection** as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Designer.

- B. Temporary Fire Protection:** Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires.
4. Prohibit smoking within any building, structure, other enclosures or in hazardous fire-exposure areas.
5. Prohibit smoking in hazardous fire-exposure areas.
6. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

- C. Permanent Fire Protection:** At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

- D. Barricades, Warning Signs, and Lights:** Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

Temporary Fencing: Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch-(3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.

- E. Environmental Protection:** Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

**3.6 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision:** Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance:** Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
  2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal:** Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

**END OF SECTION 02 80 40**

**SECTION 02 80 41 - TEMPORARY PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

**1.2 RELATED SECTIONS**

- A. **Heating and cooling requirements** are set forth in Section "Temporary Facilities - Asbestos Abatement".

**1.3 MONITORING**

- A. **Continuously monitor** and record the pressure differential between the Work Area and the building/areas outside of each Work Area with a monitoring device incorporating a continuous recorder (e.g. strip chart).

**1.4 SUBMITTALS**

- A. **Before Start of Work:** Submit design of pressure differential system to the Designer for review. Do not begin work until submittal is returned with the Designer's action stamp indicating that the submittal is returned for unrestricted use. Include in the submittal at a minimum:
  - 1. Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines
  - 2. Description of projected air flow within Work Area and methods required to provide adequate air flow in all portions of the work area
  - 3. Anticipated pressure differential across Work Area enclosures
  - 4. Description of methods of testing for correct air flow and pressure differentials
  - 5. Manufacturer's product data on the HEPA filtered fan units to be used
  - 6. Location of the machines in the Work Area
  - 7. Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power.
  - 8. Description of work practices to insure that airborne fibers travel away from workers
  - 9. Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of Work Area.
  - 10. Manufacturer's product data on auxiliary generator to be used
  - 11. Manufacturer's product data on auxiliary power switch to be used
  - 12. Schematic diagram of power and auxiliary power supply to HEPA filtered fan units
- B. **On a weekly basis:** Submit printout from pressure differential monitoring equipment. Mark printout with date and start of time for each day. Use printout paper that indicates elapsed time in intervals no greater than hours. Indicate on each day's record times of starting and stopping abatement work, type of work in progress, breaks for lunch or other purposes, periods of stop work, and filter changes. Cut printout into segments by day, attach to 8 ½" by 11" paper. Label with project name, contractors name and date.

**1.5 QUALITY ASSURANCE:**

- A. **Monitor pressure differential** at Personnel and Equipment Decontamination Units with a differential

pressure meter equipped with a continuous recorder. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops below 0.02 inch [0.5 mm] of water.

## **PART 2 - PRODUCTS**

### **2.1 HEPA FILTERED FAN UNITS:**

- A. General:** Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Use units that meet the following requirements.
- B. Cabinet:** Constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches [0.76 meters] to fit through standard-size doorways. Provide units whose cabinets are:
1. Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance
  2. Arranged to provide access to and replacement of all air filters from intake end
  3. Mounted on casters or wheels
- C. Fans:** Rate capacity of fan according to usable air-moving capacity under actual operating conditions.
- D. HEPA Filters:** Provide units whose final filter is the HEPA type with the filter media (folded into closely pleated panels) completely sealed on all edges with a structurally rigid frame.
1. Provide units with a continuous rubber gasket located between the filter and the filter housing to form a tight seal.
  2. Provide HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.
  3. Provide filters that are marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.
  4. Pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. Provide units with the following pre-filters:
    - a. First-stage pre-filter: low-efficiency type (e.g., for particles 100 um and larger)
    - b. Second-stage (or intermediate) filter: medium efficiency (eg., effective for particles down to 5 um)
    - c. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps.
- E. Instrumentation:** Provide units equipped with:
1. Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed
  2. A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge affixed near the gauge for reference, or the Magnehelic reading indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) (Liters / Second (LPS)) air delivery at that point



3. Elapsed time meter to show the total accumulated hours of operation
- F. Safety and Warning Devices:** Provide units with the following safety and warning devices:
1. Electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter
  2. Automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge
  3. Warning lights to indicate normal operation (green), too high a pressure drop across the filters (i.e., filter overloading) (yellow), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge) (red)
  4. Audible alarm if unit shuts down due to operation of safety systems
- G. Electrical components:** Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL). Each unit is to be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be grounded.
- H. Manufacturers:** Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
- I. Manufacturer:** Subject to compliance with requirements, provide products of the following or equal:
1. **HEPA filtered Fan Units:**

Aerospace America, Inc.	<a href="http://www.aerospaceamerica.com">www.aerospaceamerica.com</a>
Abatement Technologies	<a href="http://www.abatement.com">www.abatement.com</a>
  2. **Hazardous Locations:** The following manufacturer provides pneumatically powered machines for use in asbestos abatement jobs in hazardous locations where electric motors are prohibited.

Abatement Technologies	<a href="http://www.abatement.com">www.abatement.com</a>
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**2.2 NOT USED**

**2.3 NOT USED**

**PART 3 - EXECUTION**

**3.1 PRESSURE DIFFERENTIAL ISOLATION**

- A. Isolate the Work Area** from all adjacent areas or systems of the building with a Pressure Differential that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area.
- B. Relative Pressure in Work Area:** Continuously maintain the work area at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of: 0.02 inches (0.5 mm) of water.

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- C. Accomplish the pressure differential by exhausting** a sufficient number of HEPA filtered fan units from the work area. The number of units required will depend on machine characteristics, the seal at barriers, and required air circulation. The number of units will increase with increased make-up air or leaks into the Work Area. Determine the number of units required for pressure isolation by the following procedure:
1. Establish required air circulation in the work area, personnel and equipment decontamination units.
  2. Establish isolation by increased pressure in adjacent areas or as part of seals where required.
  3. Exhaust a sufficient number of units from the work area to develop the required pressure differential.
  4. The required number of units is the number determined above plus one additional unit.
  5. Vent HEPA filtered fan units to outside of building unless authorized in writing by Designer.
  6. Vent each HEPA filtered fan unit to inlet of second unit. Vent second unit to a controlled area in the building. Insure that controlled area is isolated from balance of building by critical barriers at all times that units are in operation.
  7. Mount units to exhaust directly or through disposable ductwork.
  8. Use only new ductwork except for sheet metal connections and elbows.
  9. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit.
  10. Use inflatable, disposable plastic ductwork in lengths not greater than 100 feet (30 meters).
  11. Use spiral wire-reinforced flex duct in lengths not greater than 50 feet (15 meters).
  12. Arrange exhaust as required to inflate duct to a rigidity sufficient to prevent flapping.
  13. If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet ( 2 meters) of spiral wire reinforced flex duct after direction change.
- D. Isolation of elevators, stair towers, and return air intakes:** Erect seals with an air space at doors to elevators and stair towers. Pressurize this space with HEPA-filtered air so that it is at a pressure greater than either the Work Area elevator shaft or stair tower.
1. Fabricate seal by first sealing door with duct tape and 6 mil polyethylene. Construct a barrier from ½" (13 mm) gypsum board supported by 3-5/8" (92 mm) x 25 gauge metal studs at 16" (410 mm) on centers. Space face of barrier a minimum of 3" (76 mm) from face of door. Seal barrier with 6 mil (0.15 mm) sheet plastic and duct tape.
  2. Fabricate seal by first sealing door with duct tape and 6 mil (0.15 mm) polyethylene. Construct a barrier from ½" (13mm) CDX plywood supported by 2" X 4" (51 mm x 102 mm) wood studs at 16" (410 mm) on centers. Space face of barrier a minimum of 3" (76 mm) from face of door. Seal barrier with 6 mil (0.15 mm) sheet plastic and duct tape.
  3. Use plywood and framing lumber that is treated to be fire resistant.
  4. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 inches (0.5 mm) of water higher in static pressure than

any adjacent space.

5. Locate HEPA filtered fan unit outside of work area. Fabricate a manifold as required to distribute air to individual spaces to be isolated. Provide relief venting at unit as required to prevent shut down due to low air flow while still maintaining required air pressure.
- E. Isolation of chases and enclosed stairs:** Pressurize chases and enclosed stairs with HEPA filtered air so that it is at a pressure greater than any adjacent work area.
1. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 (.5 mm ) inches of water higher in static pressure than any adjacent work area.
- F. Isolation of chases and enclosed stairs:** Pressurize chases and enclosed stairs so that they are at a pressure greater than any adjacent work area.
1. Pressurize space with centrifugal-type fans. Axial type fans are not to be used for this purpose. Continuously maintain a pressure differential in this space a minimum of 0.02 inches ( 0.5 mm) of water higher in static pressure than any adjacent work area.
- G. Isolation of return air ductwork:** Return air duct work which must be kept operating is located in the Work Area. This duct work is to be isolated from the Work Area by an enclosure forming an annular space around the duct which is positively pressurized with HEPA filtered air.
1. Wrap the duct with 6 mil (0.15 mm) polyethylene. Seal all polyethylene seams with spray glue and duct tape.
  2. Enclose wrapped duct with two layers of polyethylene. Fabricate inner layer from 6 mil (0.15 mm) polyethylene with all seams sealed with spray glue and duct tape. Arrange outer layer to support inner layer. Fabricate out of reinforced sheet plastic with seams sealed with spray glue and duct tape and reinforced with staples. Support outer layer with a frame work fabricated from 2" x 4"s (51 mm x 102 mm) at 24" (610 mm) on center. Enclosures less than 2'-6" in diameter may be reinforced with box strapping in lieu of wood framing.

### 3.2 NOT USED

### 3.3 AIR CIRCULATION IN THE WORK AREA:

- A. Air Circulation:** For purposes of this section air circulation refers to either the introduction of outside air to the Work Area or the circulation and cleaning of air within the Work Area. Maintain the Work Area and all adjacent areas or systems of the Work Area with a Pressure Differential as specified in this section that will cause a movement of outside work area to inside work area. Contractor shall continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder (e.g. strip chart).
- B. Air circulation in the Work Area** is a minimum requirement intended to help maintain airborne fiber counts at a level that does not significantly challenge the work area isolation measures. The Contractor may also use this air circulation as part of the engineering controls in the worker protection program.
- C. Determining the Air circulation Requirements:** The air flow volume (cubic meters per minute) exhausted (removed) from the workplace must exceed the amount of makeup air supplied to the enclosure. Provide a fully operational air circulation system supplying a minimum of the following air circulation rate: 4 air

changes per hour

- D. Determine Number of Units needed to achieve required air circulation according to the following procedure:
1. Determine the volume in cubic feet of the work area by multiplying floor area by ceiling height. Determine total air circulation requirement in cubic feet per minute (CFM) for the work area by dividing this volume by 60 and multiplying by the air change rate.
  2. Air Circulation Required in Cubic Feet of Air per Minute (CFM) =  
$$\frac{\text{Volume of work area (cu. ft.)}}{60 \text{ (minutes per hour)}} \times \text{Number of air changes per hour}$$
  3. Divide the air circulation requirement (CFM) above by capacity of HEPA filtered fan unit(s) used. Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics.
  4. Number of Units Needed =  
$$\frac{\text{Air circulation Requirement (CFM)}}{\text{Capacity of Unit with Loaded Filters (CFM)}}$$
  5. Add one (1) additional unit as a backup in case of equipment failure or machine shutdown for filter changing.

### 3.4 EXHAUST SYSTEM:

- A. **Pressure differential isolation and air circulation** and pressure differential in the Work Area are to be accomplished by an exhaust system as described below.
1. Exhaust all units from the Work Area to meet air circulation requirement of this section.
  2. Location of HEPA Filtered Fan Units: Locate fan unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the HEPA filtered fan unit(s) at a maximum distance from the worker access opening or other makeup air sources.
  3. The end of the unit or its exhaust duct should be placed through an opening in the plastic barrier or wall covering. Seal plastic around the unit or duct with tape.
  4. Vent to Outside of Building, unless authorized in writing by the Designer.
  5. Air Handling Unit Exhaust: The exhaust plume from air handling units should be located away from adjacent personnel and intakes for HVAC systems.
  6. Decontamination Units: Arrange Work Area and decontamination units so that the majority of make up air comes through the Decontamination Units. Use only personnel or equipment Decontamination Unit at any time and seal the other so that make up air passes through unit in use.
  7. Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Designer by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from

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the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Cover with flaps to reseal automatically if the pressure differential system should shut down for any reason. Spray flap and around opening with spray adhesive so that if flap closes meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry.

**3.5 RECIRCULATION SYSTEM:**

- A.** Pressure differential isolation and air circulation in the Work Area are to be accomplished by a recirculation system as described below.
1. Re-circulate air in the Work Area through HEPA filtered fan units to accomplish air circulation requirements of this section.
  2. Location of Fan Units: Locate HEPA filtered fan units so that air is circulated through all parts of the Work Area, and so that required pressure is maintained at all parts of Work Area geometry. Move units as necessary, so that in any location where asbestos-containing materials are being disturbed, air movement is directed away from employees, and toward the HEPA filter fan unit. Direct air flow in these locations so that it is predominantly toward workers' backs at the breathing zone elevation.

**3.6 AIR CIRCULATION IN DECONTAMINATION UNITS:**

- A. Pressure Differential Isolation:** Continuously maintain the pressure differential required for the work area in the:
1. Personnel Decontamination Unit: across the Shower Room with the Equipment Room at a lower pressure than the Clean room.
  2. Equipment Decontamination Unit: Across the Holding Room with the Wash Room at a lower pressure than the Clean Room.
- B. Air Circulation:** Continuously maintain air circulation in Decontamination Units at same level as required for Work Area.
- C. Air Movement:** Arrange air circulation through the Personnel Decontamination Unit so that it produces a movement of air from the Clean Room through the Shower Room into the Equipment Room. At each opening, the air flow velocity must be sufficient to provide visible indications of air movement into the work area.. The velocity of air flow within the enclosure must be adequate to remove airborne contamination from each worker's breathing zone without disturbing the asbestos-containing material on surfaces.

**3.7 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM:**

- A. General:** Each unit shall be serviced by a dedicated minimum 115V-20A circuit with ground fault circuit interrupter (GFCI) supplied from temporary power supply installed under requirements of Section "Temporary Facilities." Do not use existing branch circuits to power fan units.
- B. Air Flow Tests:** Air flow patterns will be checked before removal operations begin, at least once per operating shift and any time there is a question regarding the integrity of the enclosure. The primary test for air flow is to trace air currents with smoke tubes or other visual methods. Flow checks are made at each opening and at each doorway to demonstrate that air is being drawn into the enclosure and at each worker's position to show that air is being drawn away from the workers location and toward the HEPA filtration unit.

- C. Demonstrate Condition of Equipment** for each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of the following:
1. Squareness of HEPA Filter
  2. Condition of Seals
  3. Proper operation of all lights
  4. Proper operation of automatic shut down if exhaust is blocked
  5. Proper operation of alarms
  6. Proper operation of Magnehelic gauge
  7. Proper operation and calibration on pressure monitoring equipment
- D. Demonstrate Operation** of the pressure differential system to the Designer will include, but not be limited to, the following:
1. Plastic barriers and sheeting move lightly in toward Work Area,
  2. Curtain of decontamination units move lightly in toward Work Area,
  3. There is a noticeable movement of air through the Decontamination Unit.
  4. Use smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room.
  5. Use smoke tubes to demonstrate a definite motion of air across all areas in which work is to be performed.
  6. Use a differential pressure meter or manometer to demonstrate the required pressure differential at every barrier separating the Work Area from the balance of the building, equipment, ductwork or outside.
  7. Modify the Pressure Differential System as necessary to demonstrate successfully the above.
- E. Use of System during Abatement Operations:**
1. Start fan units before beginning work (before any asbestos-containing material is disturbed). After abatement work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.
  2. Monitoring Pressure Within the Enclosure: After the initial air flow patterns have been checked, the static pressure must be monitored within the enclosure. Monitoring may be made using manometers, pressure gauges, or combinations of these devices. It is recommended that they be attached to alarms and strip chart recorders.
  3. Do not shut down air pressure differential system during encapsulating procedures, unless authorized by the Designer in writing. Supply sufficient pre-filters to allow frequent changes.

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4. Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and fan units are operating again.
5. Corrective Actions: If the manometers or pressure gauges demonstrate a reduction in pressure differential below the required level, work should cease and the reason for the change investigated and appropriate changes made. The air flow patterns should be retested before work begins again.
6. At completion of abatement work, allow fan units to run as specified under section "Project Decontamination", to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

**F. Dismantling the System:**

1. When a final inspection and the results of final air tests indicate that the area has been decontaminated, fan units may be removed from the Work Area. Before removal from the Work Area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 6 mil (0.15 mm) polyethylene to prevent environmental contamination from the filters.

**END OF SECTION – 02 80 41**

**SECTION 02 80 42 - TEMPORARY ENCLOSURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of the Contract**, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to work of this section.

**1.2 SUBMITTALS:**

- A. Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal is returned for unrestricted use.

1. Strippable Coatings: Submit following:
  - a. Product description including major components and solvents.
  - b. Test report on ASTM E84 test of surface burning characteristics.
  - c. Manufacturer's installation instructions. Indicate portions applicable to the project and selected assemblies where the manufacturer offers alternatives.

2. Spray Cement: Submit following:
  - a. Product description including major components and solvents.
  - b. Manufacturer's installation instructions. Indicate portions applicable to the project.

3. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.

4. Signs: Submit samples of signs to be used.

- B. Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been "Received - Not Reviewed."

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
  - a. Strippable Coating.
  - b. Spray Cement.

**PART 2 - PRODUCTS**

**2.1 SHEET PLASTIC:**

- A. Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.
- B. Polyethylene Sheet:** Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated.
- C. Reinforced Polyethylene Sheet:** Where plastic sheet constitutes the only barrier between the work area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame-resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection



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Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.

**2.2 STRIPPABLE COATINGS:**

- A. Strippable Coatings:** Provide strippable coatings in aerosol cans or premixed for spray application formulated to adhere gently to surfaces and remove cleanly by peeling off at the completion of the work.
1. Provide only water-based latex materials.
  2. Provide materials manufactured for the specific application required.
- B. Wall coating:** designed to be easy to remove.
- C. Floor coating:** designed to provide a tough film which resists spread of water beneath plastic layer.
- D. Window coating:** recommended by the manufacturer for use on windows. Supply materials that are designed to be stable on glass in sunlight and resist the transmission of ultraviolet radiation.
- E. Fire Safety:** Provide materials that meet the following requirements:
1. When wet or while being installed:
    - a. Do not create combustible vapors
    - b. Have no flash point
    - c. Are not noxious
    - d. Department of Transportation category of non-flammable.
  2. When dry, material must have a Class A rating as a building material and meet the following requirements when tested in accordance with ASTM E-84:
    - a. Flame Spread no greater than 20
    - b. Fuel Contributed 0
    - c. Smoke Developed no more than 110
- F. Deliver materials** to the job site in unopened, factory-labeled containers.
- G. Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
- H. Manufacturer:** Subject to compliance with requirements, provide products of one of the following:
1. Isotek Corporation    Spray Poly  
P.O. Box 29799  
New Orleans, LA 70189-0799  
(504)367-9856
  2. H.B. Fuller Co.                      Spray Poly  
3900 Jackson St., NE                  Part no. 3256  
Minneapolis, MN 55421  
(800) 328-4594

**2.3 MISCELLANEOUS MATERIALS:**

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- A. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (50 mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.
- B. **Spray Cement:** Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

**PART 3 - EXECUTION**

**3.1 SEQUENCE OF WORK:**

- A. **Carry out work of this section sequentially.** Complete each of the following activities in accordance with requirements before proceeding to the next.
  - 1. Provide emergency exits and emergency lighting.
  - 2. Control access
  - 3. Provide respiratory and worker protection.
  - 4. Provide Critical Barriers.
  - 5. Prepare Area.
  - 6. Provide Primary Barriers.
  - 7. Provide Isolation Areas as required.
  - 8. Provide Secondary Barrier.

**3.2 GENERAL:**

- A. **Work Area:** the location where asbestos abatement work occurs. The Work Area is a variable of the extent of work of the Contract. It may be a portion of a room, a single room, or a complex of rooms. A "Work Area" is considered contaminated during the work, and must be isolated from the balance of the building, and decontaminated at the completion of the asbestos control work.
- B. **Completely isolate the Work Area** from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas in accordance with the procedures indicated in Section "Project Decontamination". Perform all such required cleaning or decontamination at no additional cost to owner.
- C. Construct enclosures to provide an air-tight seal around ducts and openings into existing ventilation systems and around penetrations for electrical conduits, telephone wires, water lines, drain pipes, etc. Construct enclosures to be both airtight and watertight except for those openings designed to provide entry and/or air flow control.
- D. **Size:** Construct enclosure with sufficient volume to encompass all of the working surfaces yet allow unencumbered movement by the worker(s), provide unrestricted air flow past the worker(s), and ensure walking surfaces can be kept free of tripping hazards.
- E. **Shape:** The enclosure may be any shape that optimizes the flow of ventilation air past the worker(s).
- F. **Structural Integrity:** The walls, ceilings and floors must be supported in such a manner that portions of the enclosure will not fall down during normal use.
- G. **Barrier Supports:** Provide frames as necessary to support all unsupported spans of sheeting.

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- H. Openings:** It is not necessary that the structure be airtight; openings may be designed to direct air flow. Such openings are to be located at a distance from active removal operations. They are to be designed to draw air into the enclosure under all anticipated circumstances. In the event that negative pressure is lost, they are to be fitted with either HEPA filters to trap dust or automatic trap doors that prevent dust from escaping the enclosure. Openings for exits are to be controlled by an airlock or a vestibule.
- I. Place all tools,** scaffolding, staging, etc. necessary for the work in the area to be isolated prior to completion of Work Area isolation.
- J. Areas Within an Enclosure:** Each enclosure consists of a work area, a decontamination area, and waste storage area. The work area where the asbestos removal operations occur are to be separated from both the waste storage area and the contamination control area by physical curtains, doors, and/or airflow patterns that force any airborne contamination back into the work area. Unless infeasible, the Contractor shall construct each building's containment system to enclose all of the building's respective asbestos abatement work that requires Work of This Section.
- K. Removing Mobile Objects:** Clean movable objects and remove them from the work area before an enclosure is constructed unless moving the objects creates a hazard. Mobile objects will be assumed to be asbestos contaminated and are to be either cleaned with amended water and a HEPA vacuum and then removed from the area or wrapped and then disposed of as asbestos-contaminated waste.
- L. Disabling HVAC Systems:** The power to the heating, ventilation, and air conditioning systems that service the regulated area must be deactivated and locked out. All ducts, grills, access ports, windows and vents must be sealed off with two layers of plastic to prevent entrainment of contaminated air.
- M. Operating HVAC Systems in the regulated Area:** If components of a HVAC system located in the regulated area are connected to a system that will service another zone during the project, the portion of the duct in the regulated area must be sealed and pressurized. Necessary precautions include caulking the duct joints, covering all cracks and openings with two layers of sheeting, and pressurizing the duct throughout the duration of the project by restricting the return air flow. The power to the fan supplying the positive pressure should be locked "on" to prevent pressure loss.
1. If fan providing positive pressure fails for any reason, immediately stop asbestos removal work, mist the area to reduce airborne fiber levels. Notify the Project Administrator. Do not re-start asbestos removal work until authorized by the Designer.
- N. Lockout power to Work Area** by switching off all breakers serving power or lighting circuits in work area. A lock and tag shall be placed on each breaker used to de-energize circuits and equipment with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who has applied the locks.
- O. Lockout power** to circuits running through work area wherever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who applied locks. If circuits cannot be shut down for any reason, label at intervals 4 feet (1.22 m) on center with signs reading, "DANGER live electric circuit. Electrocution hazard." Label circuits in hidden locations but which may be affected by the work in a similar manner.
- P. Inspection Windows:** Install inspection windows in locations shown on the plans or as directed by the Designer. Each inspection window is to have a 24 inch X 24 inch (610 X 610 mm) viewing area fabricated from 1/4 inch (6.35 mm) acrylic or polycarbonate sheet. Install window with top at 6 feet-6 inches (1.98 m) above floor height in a manner that provides unobstructed vision from outside to inside of the Work Area. Protect window from damage from scratching, dirt or any coatings used during the work. A sufficient

number of windows are to be installed to provide observation of all portions of the Work Area that can be made visible from adjacent areas. Inspection windows that open into uncontrolled area are to be covered with a removable plywood hatch secured by lock and key. Provide keys to Designer for all such locks.

### **3.3 EMERGENCY EXITS:**

#### **A. Provide emergency exits and emergency lighting as set forth below:**

1. Emergency Exits: At each existing exit door from the Work Area provide the following means for emergency exiting:
2. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work Area.
3. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1 inch (25.4 mm) wide. Hang a razor knife on a string beside outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2 inches (50.8 mm ) wide.
4. Provide lighted EXIT sign at each exit.
5. Provide battery-operated emergency lighting that switches on automatically in the event of a power failure.

### **3.4 CONTROL ACCESS:**

#### **A. Isolate the Work Area** to prevent entry by building occupants into Work Area or surrounding controlled areas. Accomplish isolation by the following:

1. Submit to Designer a list of doors and other openings that must be secured to isolate Work Area. Include on list notation if door or opening is in an indicated exit route.
2. After receiving written authorization from the Designer lock all doors into Work Area, or, if doors cannot be locked, chain shut. Notify the local fire department of the list of doors/or other openings which must be chained or otherwise secured shut. Cover any signs that direct emergency exiting, either outside or inside of Work Area, to locked doors. Do not obstruct doors required for emergency exits from Work Area or from building.
3. After receiving written authorization from the Designer, construct partitions or closures across any opening into Work Area. Partitions are to be a minimum of 8 feet (2.44 meters) high.
4. Fabricate partitions from 3-5/8 inch (9.21 cm) , 25 gage metal studs with ½ inch (1.27 cm) gypsum board on both faces. Brace at intervals of 4 feet (1.22 m) on center.
5. Fabricate partitions from 2 inch X 4 inch (50.8mm X 101.6mm) wood studs with ½ inch (1.27 cm) plywood on both faces. Brace at intervals of 4 feet (1.25 m) on center.
6. Fabricate partitions from 2 inch X 4 inch (50.8 mm X 101.6 mm ) wood studs with ½ inch (1.27 cm) plywood on both faces. Brace at intervals of 4 feet (1.22 m) on center. Use only fire retardant treated wood.
7. Fabric-type folding partitions: provide temporary partitions across fabric-type folding doors or

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partitions into Work Area.

8. Rigid-type folding partitions: remove operating bar and latch on clean side of folding partitions. Fasten down operating lever with hook and chain or other secure device on Work Area side. At completion of all abatement work reinstall bar and latch and adjust for proper operation.
  9. Modify elevator controls to prevent elevators from stopping at doors in Work Areas. This work is to be performed by a qualified elevator technician.
  10. Replace passage sets on doors required for exiting from Work Area with temporary locksets for duration of the project. Use entry type locksets that are key lockable from one side and always operable from inside. Install locksets with key side in stair tower and escape side on Work Area side. Provide one key to Owner and maintain one key in clean room of decontamination unit. After meeting Contractor release criteria set forth in Section "Project Decontamination", reinstall original passage sets and adjust for proper operation.
- B. Locked Access:** Arrange Work Area so that the only access into Work Area is through lockable doors to personnel and equipment decontamination units.
1. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Do not use deadbolts or padlocks.
  2. Replace locksets or passage sets on doors leading to decontamination units with temporary locksets for duration of the project. Remove any deadbolts or padlocks. Use entry type locksets that are key lockable from outside and always unlocked and operable from inside. After meeting contractor release criteria set forth in Section "Project Decontamination" reinstall original locks, passage sets and locksets and adjust for proper operation.
  3. Provide one key for each door to Owner, and Designer and maintain one key in clean room of decontamination unit (3 total).
- C. Visual Barrier:** Where the Work Area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that the work procedures are not visible to building occupants. Where this visual barrier would block natural light, substitute frosted or woven rip-stop sheet plastic in locations approved by the Designer.
- D. Demarcation.** Demarcate the regulated area in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area.
- E. Access.** Limit access to regulated areas to authorized persons as defined by OSHA, and to the Owner, Designer, Project Administrator or a representative authorized by one of these entities.
- F. Provide Warning Signs** at each locked door leading to Work Area reading as follows:
1. Print text in both English and Spanish

**Legend**

KEEP OUT

BEYOND THIS POINT

ASBESTOS ABATEMENT WORK 1 inch (25.4 mm) Sans Serif Gothic or Block

IN PROGRESS

**Notation**

3 inch ( 77 mm) Sans Serif Gothic or Block

1 inch (25.4 mm) Sans Serif Gothic or Block

1 inch (25.4 mm) Sans Serif Gothic or Block

1 inch (25.4 mm) Sans Serif Gothic or Block

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BREATHING ASBESTOS DUST 14 Point Gothic  
MAY BE HAZARDOUS TO YOUR  
HEALTH

2. Provide Warning Signs at each locked door leading to Work Area reading as follows

<b>Legend</b>	<b>Notation</b>
KEEP OUT	3 inch (77 mm) Sans Serif Gothic or Block
CONSTRUCTION	1 inch (25.4 mm) Sans Serif Gothic or Block
WORK AREA	1 inch (25.4 mm) Sans Serif Gothic or Block
PROTECTIVE CLOTHING REQUIRED BEYOND THIS POINT	14 Point Gothic

3. Immediately inside door and outside critical barriers post an approximately 20 inch by 14 inch (508 mm X 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

**Legend**  
DANGER  
ASBESTOS  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AUTHORIZED PERSONNEL ONLY  
WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA

4. Provide spacing between respective lines at least equal to the height of the respective upper line.

**3.5 ALTERNATE METHODS OF ENCLOSURE:**

- A. Alternate methods** of containing the Work Area may be submitted to the Designer for approval in accordance with procedures set forth in Section "Substitutions". Do not proceed with any such method(s) without prior written approval of the Designer.
- B. Notification:** Before work which involves the removal of more than 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of thermal system insulation or surfacing material is begun using an alternative method which has been the subject of required evaluation and certification. Send a copy of such evaluation and certification to the national office of OSHA, Office of Technical Support, Room N3653, 200 Constitution Avenue, NW, Washington, DC 20210 and to the Designer.
- C. Use a control method** that encloses, contains or isolates the processes or source of airborne asbestos dust, or otherwise captures or redirects such dust before it enters the breathing zone of employees.
- D. Certification:** Submit a certification from a certified industrial hygienist (CIH) or licensed professional engineer who is also qualified as a project designer, who has evaluated the work area, the projected work practices and the engineering controls and who certifies in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs and any requirements of Section "Respiratory Protection" under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria of OSHA 1926.1101, and as determined in accordance with the portion of Section "Summary of Work - Asbestos Abatement" that describes the Owner's monitoring of the project.

**3.6 RESPIRATORY AND WORKER PROTECTION:**

- A. Before proceeding** beyond this point in providing Temporary Enclosures:
1. Provide Worker Protection
  2. Provide Respiratory Protection
  3. Provide Personnel Decontamination Unit

**3.7 CRITICAL BARRIERS:**

- A. Completely Separate** the Work Area from other portions of the building, and the outside by closing all openings with sheet plastic barriers at least 6 mil (0.15 mm) in thickness, or by sealing cracks leading out of Work Area with duct tape.
- B. Individually seal** all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, and other openings into the Work Area with duct tape alone or with polyethylene sheeting at least 6 mil (0.15 mm) in thickness, taped securely in place with duct tape. Maintain seal until all work including Project Decontamination is completed. Take care in sealing of lighting fixtures to avoid melting or burning of sheeting.
- C. Provide Sheet Plastic** barriers at least 6 mil (0.15 mm) in thickness as required to seal openings completely from the Work Area into adjacent areas. Seal the perimeter of all sheet plastic barriers with duct tape or spray cement.
- D. Mechanically Support** sheet plastic independently of duct tape or spray cement seals so that seals do not support the weight of the plastic. Following are acceptable methods of supporting sheet plastic barriers. Alternative support methods may be used if approved in writing by the Designer.
1. Plywood squares 6 inch x 6 inch x 3/8 inch (152 mm x 152 mm x 9.53mm ) held in place with one 6d smooth masonry nail or electro-galvanized common nail driven through center of the plywood and duct tape on plastic so that plywood clamps plastic to the wall. Locate plywood squares at each end, corner and at maximum 4 feet (1.22 m) on centers.
  2. Nylon or polypropylene rope or wire with a maximum unsupported span of 10 feet (3.05 m), minimum 1/4 inch (6.35 mm) in diameter suspended between supports securely fastened on either side of opening at maximum 1 foot (304.8 mm) below ceiling. Tighten rope so that it has 2 inches (50.8 mm) maximum dip. Drape plastic over rope from outside Work Area so that a two foot long flap of plastic extends over rope into Work Area. Staple or wire plastic to itself 1 inch (25.4 mm) below rope at maximum 6 inches (152 mm) on centers to form a sheath over rope. Lift flap and seal to ceiling with duct tape or spray cement. Seal loop at bottom of flap with duct tape. Erect entire assembly so that it hangs vertically without a "shelf" upon which debris could collect.
- E. Provide Pressure Differential System** per Section "Temporary Pressure Differential & Air Circulation System".
1. Clean housings and ducts of all overspray materials prior to erection of any Critical Barrier that will restrict access.

**3.8 PREPARE AREA:**

- A. Scaffolding:** If fixed scaffolding is to be used to provide access HEPA vacuum and wet clean area prior to scaffolding installation.

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- B. Remove all electrical and mechanical items**, such as lighting fixtures, clocks, diffusers, registers, escutcheon plates, etc. which cover any part of the surface to be worked on with the work.
- C. Remove all general construction items** such as cabinets, casework, door and window trim, moldings, ceilings, trim, etc., which cover the surface of the work as required to prevent interference with the work. Clean, decontaminate and reinstall all such materials, upon completion of all removal work with materials, finishes, and workmanship to match existing installations before start of work.
- D. Clean all contaminated furniture**, equipment, and or supplies with a HEPA filtered vacuum cleaner or by wet cleaning, as specified in Section "Project Decontamination", prior to being moved or covered. All equipment furniture, etc. is to be deemed contaminated unless specifically declared as uncontaminated on the drawings or in writing by the Designer.
- E. Clean All Surfaces In Work Area** with a HEPA filtered vacuum or by wet wiping prior to the installation of primary barrier.
- F. Cleaning and Sealing Surfaces:** After cleaning with water and a HEPA vacuum, surfaces of stationary objects should be covered with two layers of plastic sheeting. The sheeting should be secured with duct tape or an equivalent method to provide a tight seal around the object.

**3.9 PRIMARY BARRIER:**

- A. Protect building and other surfaces** in the Work Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below.
  - 1. Strippable Coating:** If strippable coating is used, perform all work in strict compliance with manufacturer's instructions. Carry out work in the following sequence.
    - a. **Inspect:** Before start of coating work inspect all surfaces to be coated. Report on any surfaces that may be damaged by the material or any condition that may interfere with adhesion of the coating to a surface to the Designer before application of coating.
    - b. Photograph or videotape existing damage to affected surfaces and submit documentation to Designer.
    - c. **Test Patches:** Apply test patches as directed by Owner or Designer. Apply a small area of strippable coating to a hidden or obscure area of each surface in the Work Area to be coated. Allow to dry and peel off. Demonstrate results to Designer prior to coating entire area. Commence coating of area only after receiving written authorization from the Designer.
    - d. Cover surfaces and equipment in work area from which coating may not strip cleanly.
    - e. Cover shelving, clocks, light fixtures and other equipment with one layer of 6 mil (0.15 mm) sheet plastic.
    - f. Cover fabric, paper, cork wall coverings or unpainted gypsum board with one layer of 6 mil (0.15 mm) sheet plastic.
    - g. Tape over any cracks that are larger than 1/16 inch (1.59 mm).
    - h. Tape over electrical outlets, switches, door locks etc.



- i. Wood paneling in area may have the finish partially removed by the strippable coating. These surfaces are to be coated directly with strippable coating and are not to be covered with sheet plastic. Refinishing of the this paneling will be accomplished by the Owner and is not a part of the work of this contract.
  - 1) Cover wood paneling in Work Area with one layer of 6 mil (0.15 mm) sheet plastic.
  - 2) Apply small area of coating in concealed location to wood finishes in Work Area. If finish is removed when coating is stripped inform Designer. Cover wood surface with one layer of 6 mil (0.15 mm) sheet plastic unless otherwise notified by Designer.
  - 3) Base bid is for direct coating of wood paneling.
  - 4) If a layer of sheet plastic is necessary this will be a change to the Contract Sum. Submit proposal for change in Contract Sum for the addition of sheet plastic to the Designer.
- j. Cover carpeting with three (3) layers of polyethylene sheeting at least 6 mil (0.15 mm) in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.
- k. Do not use strippable coating as an adhesive to hold sheet plastic in place.
- l. Coat or cover windows into Work Area:
  - 1) Coat windows with window coating applied in a minimum 10 mil (0.254 mm) thickness when wet.
- m. Protect critical barriers: Install strippable coating so that it will not remove critical barriers during stripping of coating. Cover critical barriers comprised of sheet plastic with a second layer of sheet plastic configured to be removed with strippable coating. Protect critical barriers made from tape with a protective layer of sheet plastic or duct tape.
- n. Coat all surfaces in Work Area with strippable coating in following order.
  - 1) Walls: Coat seams, corners, and junctions vertically. Coat balance of walls horizontally lapping over vertical sprayed areas by 50%.
  - 2) Floor: Coat floor lapping wall by 12 inches (305mm). Start at point furthest from entrance to Work Area and work toward door.
  - 3) Use straight edge to shield ACM from coating during spray application.

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- o. Apply: to a minimum of the following thicknesses. Thickness is to be measured when material is wet using a wet film thickness gauge.

SURFACE TO BE COATED	MINIMUM THICKNESS WHEN WET	REQUIRED COATING TYPE
Critical Barriers	Not Applicable	Sheet Plastic Covers
Glass	10 mil (0.254 mm)	Window Coating
Plastic Over Glass	2 mil (0.051 mm)	Wall Coating
Paneling Painted Walls, Wall Covering	12 mil (0.305 mm)	Wall Coating
Glazed Tile Smoothly Painted Brick, Painted Concrete Block	15 mil (0.381 mm)	Wall Coating
Floors	15 mil (0.381 mm)	Floor Coating
Unpainted Brick Unpainted Concrete Block, Rough Wood	20 mil (0.51 mm)	Wall Coating

- 1) Coat brick and concrete block with a sufficient thickness of coating to obscure color of substrate completely.
  - 2) Do not apply over tacky or chalky adhesives remaining from carpet or other flooring covering removal.
- p. Respiratory protection: Require that all workers in Work Area from start of spray operation until all surfaces are dry use as a minimum requirement a half-face negative pressure respirator equipped with combination ammonia and HEPA type filter cartridges or other appropriate respiratory protection as required by OSHA 29 CFR 1926.1101(h)(2) and as specified in Section "Respiratory Protection".
- q. Worker protection: Equip all workers in Work Area during spray operation with eye protection, disposable gloves, and disposable paper suits.
- r. Ventilation: during spraying operation maintain a minimum of 4 air changes per hour in the entire Work Area. Operate one additional HEPA filtered fan unit per spray operator in area while spraying is taking place.
2. Sealing Elevators: If an elevator shaft is located in the regulated area, it should be either shut down or isolated by sealing with two layers of plastic sheeting. The sheeting should provide enough slack to accommodate the pressure changes in the shaft without breaking the air-tight seal.
3. Elevator: Coat walls, floor and ceiling of elevator in same manner as Work Area. Arrange entry to Work Area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section "Project Decontamination". Refer to Section "Summary of the Work" for additional requirements for protection of elevator.

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4. Sheet Plastic: Protect surfaces in the Work Area with two (2) layers of plastic sheeting on floor and walls, or as otherwise directed on the Contract Drawings or in writing by the Designer. Perform work in the following sequence.
  - a. All seams in the sheeting should overlap, be staggered and not be located at corners or wall-to-floor joints.
  - b. Unless work includes floor tile/mastic removal, cover floor of Work Area with 2 individual layers of clear polyethylene sheeting, each at least 6 mil (0.15 mm) in thickness, turned up walls at least 12 inches (305 mm). Form a sharp right angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.
  - c. Unless work includes removal of carpeting and floor tile/mastic, cover carpeting with three (3) layers of polyethylene sheeting at least 6 mil (0.15 mm) in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.
  - d. Cover Sheet Plastic in areas where scaffolding is to be used with a single layer of ½ inch (13 mm) CDX plywood or 1/4 inch (6.5 mm) tempered hardboard. Wrap edges and corners of each sheet with duct tape. At completion of abatement work wrap plywood or hardboard with 2 layers of 6 mil (0.15 mm) polyethylene and move to next Work Area or dispose of as an asbestos-contaminated waste material in accordance with section "Disposal of Regulated Asbestos Containing Materials".
  - e. Cover all walls in Work Area including "Critical Barrier" sheet plastic barriers with one layer of polyethylene sheeting, at least 6 mil (0.15 mm) in thickness, mechanically supported and sealed with duct tape or spray-glue in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated on the Contract Documents or in writing by the Designer.
  - f. Elevator: Cover walls, floor and ceiling of elevator with 2 layers of 6 mil (0.15 mm) polyethylene. Arrange entry to Work Area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section "Project Decontamination". Refer to Section "Summary of the Work" for additional requirements for protection of elevator.
  - g. Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4 inch (19.1 mm) exterior grade plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials.
  - h. Repair of Damaged Polyethylene Sheeting: Remove and replace plastic sheeting which has been damaged by removal operations or where seal has failed allowing water to seep between layers. Remove affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry.

**3.10 ISOLATION AREA:**

- A. Maintain isolation areas** between the Work Area and adjacent building area:
1. In locations shown on the plans.
  2. In unoccupied rooms located between Work Area and adjacent occupied portions of the building.
  3. In locations where separation between Work Area and occupied portions of building is formed by sheet plastic and/or temporary barriers.
  4. Floor below Work Area.
- B. Form isolation area** by controlling access to the space in the same manner as a Work Area. Physically isolate the space from the Work Area and adjacent areas. Accomplish physical isolation by:
1. Installing critical barriers in unoccupied space.
  2. Erecting a second Critical Barrier a minimum of 3 feet (1.0 m) away from Work Area.

**3.11 STOP WORK:**

- A. If the Critical or Primary barrier falls** or is breached in any manner stop asbestos removal work immediately and comply with "Stop Work" requirements of Section "Summary of Work - Asbestos Abatement". Do not start work until authorized in writing by the Designer.

**3.12 EXTENSION OF WORK AREA:**

- A. Extension of Work Area:** If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, then add affected area to the Work Area, enclose it as required by this Section of the specification and decontaminate it as described in Section "Project Decontamination".

**3.13 SECONDARY BARRIER:**

- A. Secondary layer** of plastic as a drop cloth to protect the primary layer from debris generated by the asbestos abatement work is specified in the appropriate work sections.

**3.14 EXTERIOR ENCLOSURES:**

- A. Construct exterior enclosures** as a Critical Barrier as necessary to completely enclose the work. Fabricate from reinforced polyethylene sheeting and 2 inch x 4 inch (51mm X 102 mm) wood framework. Attach to existing building components or brace as necessary for lateral stability. Construct walls to meet all state and local regulations for construction of temporary buildings. Construct to resist a wind of 30 MPH (13.41 m/s), slope ceiling to permit drainage of rain water.

**END OF SECTION – 02 80 42**

**SECTION 02 80 43 - REGULATED AREAS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract**, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

**1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Worker Protection:** is specified in Section "Worker Protection – Asbestos Abatement".  
**B. Respiratory Protection:** is specified in Section "Respiratory Protection"  
**C. Wet Decontamination Facilities:** are described in Section "Decontamination Units."

**1.3 DESCRIPTION OF WORK:**

- A.** Work of this section consists of preparing a Regulated Area for the work.

**1.4 SUBMITTALS**

- A. Before the Start of Work:** Submit the following to the Designer for review. Begin no work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
1. HEPA Filtered Vacuum Cleaners: Submit product data.
  2. Signs: Submit samples of each type of sign to be used.
  3. Warning Tape: Submit samples.

**PART 2 - EQUIPMENT**

**2.1 PRODUCTS**

**A. HEPA Filter Vacuum Cleaners:**

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:
2. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Nilfisk of America, Inc.      [www.nikliskcfm.com](http://www.nikliskcfm.com)

Minuteman International      [www.minutemanintl.com](http://www.minutemanintl.com)

Sylvane, Inc.      [www.sylvane.com](http://www.sylvane.com)

**B. Plastic Sheet:**

1. Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.

### **PART 3 - EXECUTION**

#### **3.1 SECURING WORK AREA:**

- A. **Secure work** area from access by occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area, by scheduling work for periods of time that the building is unoccupied, or by constructing temporary wood stud and plywood barriers.

#### **3.2 DEMARCATION OF REGULATED AREA:**

- A. **Demarcation.** Demarcate the Regulated Area with a sheet plastic drop cloth, signs and barrier tape. Configure the regulated area in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos.

1. Drop Cloth: Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.
2. Signs: Post warning signs that carry the following legends in both English and Spanish:
  - a. First Sign: Provide warning signs at each locked door leading to the controlled area reading as follows:

<b>Legend</b>	<b>Notation</b>
KEEP OUT	3 inch (76.2 mm) Block

- b. Second Sign: Immediately inside the locked door and outside the controlled area post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:  
**Legend:**

DANGER  
ASBESTOS  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AUTHORIZED PERSONNEL ONLY  
WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS  
AREA

3. Barrier Tape: Where the controlled area is in a large area such as on part of a boiler room or open office area, delineate area with 3 inch (76.2 mm) wide polyethylene ribbon with the printed warning, "CAUTION ASBESTOS REMOVAL". Install this ribbon at between 3 and 4 feet (0.91 and 1.22 meters) above the floor.

#### **3.3 SCHEDULING:**

- A. Work may be carried out** during normal working hours in those areas which can be completely secured by lockable doors from access by building occupants and staff, and which have HVAC equipment that can be shut down and locked off. Otherwise, work is to be carried out after building occupants and cleaning staff have left.

**3.4 GENERAL PROCEDURES:**

- A. The following precautions and procedures** have application to work of this section. Workers must exercise caution to avoid release of asbestos fibers into the air:

1. Setup and management of the controlled area is to be under the supervision of a OSHA Competent Person as described in Section "Project Coordination - Asbestos Abatement".
2. Before start of work comply with requirement for in Sections "Worker Protection", and "Respiratory Protection".
3. Do not allow eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in the Regulated Area.
4. Shut down any air handling equipment bringing air into or out of the Regulated Area.
5. Clean any existing dust or debris from the floor and walls, and other surface in the immediate location of the work prior to commencing work by damp-mopping or by use of a High Efficiency Particulate Air (HEPA) filtered vacuum.
6. Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.
7. Seal all openings, supply and exhaust vents, and convectors within ten (10) feet (3.05 meters) of the Work Area with 6 mil (0.15 mm) polyethylene sheeting secured and completely sealed with duct tape.
8. Perform the work per the appropriate specification section.
9. Immediately remove any asbestos-containing debris by using a HEPA vacuum or by spraying with amended water or removal encapsulant, collecting with wet paper towels, placing in a disposal bag while still wet, and cleaning surfaces with wet paper towels.
10. Thoroughly decontaminate any tools or equipment used at completion of the work.
11. If work day is complete or if moving to another regulated area: all workers remove paper suits turning them inside out while doing so.
12. Place the suits in a properly labeled disposal bag.
13. Neck down the bag and collapse it with the HEPA vacuum.

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14. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.
  15. Clean all surfaces of the Work Area by use of a HEPA filter vacuum until no visible residue remains.
- B. At completion of work** require all workers to complete decontamination procedures in accordance with Section "Worker Protection".
- C. Remove respirators** using the procedure in Section "Worker Protection".
- D. At completion of work** require all workers to complete wet decontamination procedures in accordance with Section "Worker Protection".

**END OF SECTION - 02 80 43**



**SECTION 02 80 44 - WORKER PROTECTION - ASBESTOS ABATEMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK:**

- A. This section describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

**1.3 RELATED WORK SPECIFIED ELSEWHERE:**

- A. **Respiratory Protection:** is specified in Section "Respiratory Protection".

**1.4 WORKER TRAINING:**

- A. **AHERA Accreditation:** All workers are to be accredited as Abatement Workers as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).
- B. **State and Local License:** All workers are to be trained, certified and accredited as required by state or local code or regulation.
- C. **Training:** Provide training for all workers that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

**1.5 MEDICAL SURVEILLANCE:**

- A. **Provide a medical surveillance program** as required in the OSHA standard (29 CFR 1926.1101).
- B. **Provide a medical surveillance program** and physician's opinion before a respirator is assigned as required by 29 CFR 1910.134 and 29 CFR 1926.103(e)(10) .
- C. **Provide medical examination** that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

**1.6 SUBMITTALS:**

- A. **Before Start of Work:** Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use.
  - 1. **AHERA Accreditation:** Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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2. **State and Local License:** Submit evidence that all workers have been trained, certified and accredited as required by state or local code or regulation.
3. **Certificate Worker Acknowledgment:** Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.
4. **Report from Medical Examination:** conducted within last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the Work Area. Submit, at a minimum, for each worker the following:
  - a. Name
  - b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
  - c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and
  - d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
  - e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure (29 CFR 1926.1101(m)).
  - f. A legible typed version of the physician's name, the physician's signature, and date of examination.
4. **Notarized Certifications:** Submit certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

**PART 2 - EQUIPMENT**

**2.1 PROTECTIVE CLOTHING:**

- A. **General.** Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet (7.5 linear meters or 3 square meters ) of TSI or surfacing ACM or PACM.
- B. **Coveralls:** Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.
- C. **Coveralls:** Provide cloth full-body coveralls and hats, require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment Room of the Personnel Decontamination Unit. Dispose of coverall as asbestos waste at completion of all work.

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- D. **Additional Protective Clothing:** Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.
- E. **Cold Weather Gear:** Provide each worker with an insulated jacket, pants, gloves, and hat. Require that cold weather gear be removed in Equipment Room of Personnel Decontamination Unit. Dispose of cold weather gear as asbestos waste at completion of all work.
- F. **Boots:** Provide work boots with non-skid soles, and where required by OSHA, foot protectives, for all workers. Provide boots at no cost to workers. Paint uppers of all boots red with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with ACM. Dispose of boots as asbestos-contaminated waste at the end of the work.
- G. **Hard Hats:** Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Designer, Project Administrator, and Owner. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean, decontaminate and bag hats before removing them from Work Area at the end of the work.
- H. **Goggles:** Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.
- I. **Gloves:** Provide work gloves to all workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.

**2.2 ADDITIONAL PROTECTIVE EQUIPMENT:**

- A. Disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Owner, Designer, Project Administrator, and other authorized representatives who may inspect the job site. Provide six (6) complete coveralls per day.

**PART 3 - EXECUTION**

**3.1 GENERAL:**

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. The following procedures are minimums to be adhered to regardless of fiber count in the Work Area.
- B. Each time Work Area is entered remove all street clothes in the Changing Room of the Personnel Decontamination Unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.

**3.2 DECONTAMINATION PROCEDURES:**

- A. Require all workers to adhere to the following personal decontamination procedures whenever they leave

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the Work Area:

1. Type C Supplied Air or Powered Air-Purifying Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area:
  - a. When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the equipment room.
  - b. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum:
  - c. Thoroughly wet body including hair and face. If using a Powered Air-Purifying Respirator (PAPR) hold blower unit above head to keep canisters dry.
  - d. With respirator still in place thoroughly wash body, hair, respirator face piece, and all parts of the respirator except the blower unit and battery pack on a PAPR. Pay particular attention to seal between face and respirator and under straps.
  - e. Take a deep breath, hold it and/or exhale slowly, completely wet hair, face, and respirator. While still holding breath, remove respirator and hold it away from face before starting to breathe.
  - f. Carefully wash facepiece of respirator inside and out.
2. If using PAPR: shut down in the following sequence, first cap inlets to filter cartridges, then turn off blower unit (this sequence will help keep debris which has collected on the inlet side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.
  - a. Shower completely with soap and water.
  - b. Rinse thoroughly.
  - c. Rinse shower room walls and floor prior to exit.
  - d. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.
3. Air Purifying-Negative Pressure Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area with a half or full face cartridge type respirator:
  - a. When exiting area, remove disposable coveralls, disposable head-covers, and disposable footwear covers or boots in the Equipment Room.
  - b. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator and filters to avoid asbestos fibers while showering. The following procedure is required as a minimum:
  - c. Thoroughly wet body from neck down.

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- d. Wet hair as thoroughly as possible without wetting the respirator filter if using an air purifying type respirator.
- e. Take a deep breath, hold it and/or exhale slowly, complete wetting of hair, thoroughly wetting face, respirator and filter (air purifying respirator). While still holding breath, remove respirator and hold it away from face before starting to breathe.
- f. Dispose of wet filters from air purifying respirator.
- g. Carefully wash facepiece of respirator inside and out.
- h. Shower completely with soap and water.
- i. Rinse thoroughly.
- j. Rinse shower room walls and floor prior to exit.
- k. Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

**B. Remote Shower:** The procedures above are to be used if the decontamination facility is used as a remote shower. If a worker cannot gain direct access to the Equipment Room require that he enter Decontamination Unit and proceed directly through Shower Room to Equipment Room. Decontamination procedure is then completed as required above.

**C. Within Work Area:**

- 1. Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. To eat, chew, drink or smoke, workers shall follow the procedure described above, then dress in street clothes before entering the non-Work Areas of the building.

**3.3 CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT:**

Following this section is a Certificate of Worker Training. After each worker has been included in the Contractor's Respiratory Protection Program, completed the training program and medical examination, secure a fully executed copy of this form.

**END OF SECTION - 02 80 44**

**CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT**

PROJECT NAME \_\_\_\_\_ DATE \_\_\_\_\_

PROJECT ADDRESS \_\_\_\_\_

CONTRACTOR'S NAME \_\_\_\_\_

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

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

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

**TRAINING COURSE:** You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. This training must have been the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

Signature \_\_\_\_\_ Employee Number \_\_\_\_\_

Printed Name \_\_\_\_\_ Witness \_\_\_\_\_

**SECTION 02 80 45 - RESPIRATORY PROTECTION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract**, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK:**

- A. Instruct and train each worker** involved in asbestos abatement or maintenance and repair of friable asbestos-containing materials (ACM) in proper respiratory use and require that each worker always wear a respirator, properly fitted on the face in the Work Area from the start of any operation which may cause airborne asbestos fibers until the Work Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

**1.3 DEFINITIONS:**

- A. "Negative Pressure Respirator":** A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
- B. "Protection Factor":** The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.
- C. "Respirator":** A device designed to protect the wearer from the inhalation of harmful atmospheres.

**1.4 STANDARDS:**

- A. Except to the extent** that more stringent requirements are written directly into the Contract Documents, the latest edition of the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.
  - 1. OSHA -** U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards Section 29 CFR 1910.1001, Section 1910.134, and Section 29 CFR 1926.1101.
  - 2. CGA -** Compressed Gas Association, Inc., New York, Pamphlet G-7, "Compressed Air for Human Respiration", and Specification G-7.1 "Commodity Specification for Air".
  - 3. CSA -** Canadian Standard Association, Rexdale, Ontario, Standard Z180.1, "Compressed Breathing Air".
  - 4. ANSI -** American National Standard Practices for Respiratory Protection, ANSI Z88.2.

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5. **NIOSH** - National Institute for Occupational Safety and Health
  - NIOSH Respirator Decision Logic (May 1987) DHHS/NIOSH Publication No. 87-108;
  - NIOSH/EPA, "A Guide to Respiratory Protection for the Asbestos Abatement Industry" EPA-560-OPTS-86-001 (September 1986);
  - 42 CFR 84, NIOSH Standard for Certification of Non-Powered Air Purifying Respirator filters;
  - 30 CFR 11, NIOSH - Certification of Respirators
6. **MSHA** - Mine Safety and Health Administration

**1.5 SUBMITTALS:**

**A. Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal is returned for unrestricted use.

1. **Product Data:** Submit manufacturer's product information for each component used, including NIOSH and MSHA Certifications for each component in an assembly and/or for entire assembly.
2. **System Diagram:** When a supplied air respiratory system is required by the work, submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in Work Area(s), routing of air lines to Work Area(s) from compressor.
3. **Operating Instruction:** Submit complete operating and maintenance instructions for all components and systems as a whole. Submittal is to be in bound manual form suitable for field use.
4. **Respiratory Protection Program:** Submit Contractor's written respiratory protection program manual as required by OSHA 1926.1101.
5. **Initial Exposure Assessment:** Submit level of respiratory protection intended for each operation required by the project. Base this selection on an "Initial Exposure Assessment" as required by OSHA 29 CFR 1926.1101. Submit information to support this "Initial Exposure Assessment" on the form included at the end of this Section.
  - a. Submit data from exposure monitoring for the PEL and EL from prior asbestos jobs within 12 months;
  - b. Submit monitoring and analysis that were performed in compliance with the OSHA asbestos standard in effect;
  - c. Submit data that was obtained under workplace conditions "closely resembling" those that will exist during the Work;
  - d. Submit data from past asbestos jobs where the type of asbestos abatement and other work, material, control methods, work practices, and environmental conditions closely resemble those that will exist during the Work;
  - e. Submit exposure data from prior asbestos jobs where the work that was conducted by employees whose training and experience are no more extensive than that of employees performing the current job;
  - f. Based on the exposure data from the previous asbestos jobs, select respiratory protection for



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the Work that will, to a high degree of certainty, prevent worker exposures (inside the respirator) that exceed the Permissible Exposure Limits (PEL) set forth in this Section of the specifications.

- 6. Resume information:** Submit resume and information on training for individual monitoring the operation of supplied air respiratory systems. Submit training certifications where applicable.

**1.6 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS:**

- A. Provide air** used for breathing in supplied air respiratory systems that meets or exceeds standards set for C.G.A. type 1 (Gaseous Air) Grade H or CSA Z180.1 whichever presents the more stringent quality standard:

**1.7 ALLOWABLE CONTAMINANTS:**

- A. Supply air** that has an asbestos concentration no greater than outside ambient conditions.  
**B. Supply air** that meets the level of contaminants allowed according to the air quality standard specified.  
**C. The table below** sets forth the quantity of any given contaminant allowed according to the referenced standards:

CONTAMINANT	CGA Type 1 (Gaseous Air)			CSA Z180.1
	Grade D	Grade E	Grade H	
Carbon Monoxide, PPM/v	20	10	5	5
Carbon Dioxide, PPM/v	1000	500	500	500
Condensed Hydrocarbons, mg./cu. meter	5	5		1
Gaseous Hydrocarbons - as methane, PPM/v			10	25
Water Vapor - PPM/v dewpoint	(1) -50F	(1) -50F	(1) -50F	27 -63F
Objectionable Odors	None	None	None	None
Nitrogen Dioxide, PPM/v	—	—	0.5	0.2
Nitrous Oxide, PPM/v	—	—	—	5
Sulfur Dioxide, PPM/v	—	—	0.5	—
Halogenated solvents, PPM/v	—	—	1	—
Other gaseous contaminants	—	—	—	(2)
Inorganic particulates, mg./cu. meter	—	—	—	1

— Indicates that the standard shows no limiting characteristics

(1) The CGA standards do not indicate a specific moisture limit when the ambient temperature is above

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freezing. However, since a moisture content no greater than a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint (66 PPM/v) is necessary for carbon monoxide elimination, the CO limits could not be met unless the air were dried to a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint or better.

- (2) Maximum allowable content of trichlorotrifluoroethane, dichlorodifluoromethane, and chlorodifluoromethane is 2 PPM/v for each. Unlisted contaminants shall not exceed one-tenth of the Threshold Limit Values (TLV's) for Chemical Substances in Workroom air adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

**1.8 DELIVERY:**

- A. Deliver replacement parts, etc.,** not otherwise labeled by NIOSH or MSHA to job site in manufacturer's containers.

**PART 2 - EQUIPMENT**

**2.1 AIR PURIFYING RESPIRATORS**

- A. Respirator Bodies:** Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit (0 degrees Celsius).
- B. Filter Cartridges:** Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with 42 CFR Part 84 and ANSI Z228.2. Also, additional cartridge sections may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.
- C. Non-permitted respirators.** Do not use single use, disposable or quarter face respirators.

**2.2 SUPPLIED AIR RESPIRATOR SYSTEMS:**

- A. Provide equipment** capable of producing air of the quality and volume required by the above reference standards applied to the job site conditions and crew size. Comply with provisions of this specification if more stringent than the governing standard.
- B. Facepiece and Hose:** Provide full facepiece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure facepiece.
- C. Auxiliary backup system:** In atmospheres which contain sufficient oxygen (greater than or equal to 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator equipped with an emergency back up HEPA filter.
- D. Escape air supply:** In atmospheres which are oxygen deficient (less than 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator incorporating an auxiliary self-contained breathing apparatus (SCBA) which automatically maintains an uninterrupted air supply in pressure demand mode with a positive pressure face piece.
- E. Backup air supply:** Provide a reservoir of compressed air located outside the Work Area which will automatically maintain a continuous uninterruptable source of air automatically available to each connected facepiece and hose assembly in the event of compressor shut-down, contamination of air delivered by

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compressor, power loss or other failure. Provide sufficient capacity in the back-up air supply to allow a minimum escape time of one-half hour times the number of connections available to the Work Area. Air requirement at each connection is the air requirement of the respirators in use plus the air requirement of an average-sized adult male engaged in moderately strenuous activity.

- F. Warning device:** Provide a warning device that will operate independently of the building's power supply. Locate so that alarm is clearly audible above the noise level produced by equipment and work procedures in use, in all parts of the Work Area and at the compressor. Connect alarm to warn of:
1. Compressor shut down or other fault requiring use of backup air supply
  2. Carbon Monoxide (CO) levels in excess of 5 PPM/V
- G. Carbon Monoxide (CO) Monitor:** Continuously monitor and record on a strip chart recorder Carbon Monoxide (CO) levels. Place monitors in the air line between compressor and back-up air supply and between backup air supply and workers. Connect monitors so that they also sound an alarm as specified under "Warning Devices".
- H. Compressor Shut Down:** Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sound if any of the following occur:
1. Carbon Monoxide (CO) concentrations exceed 5 PPM/v in the air line between the filter bank and backup air supply
  2. Compressor temperature exceeds normal operating range
- I. Compressor Motor:** Provide a compressor driven by an electric motor. Do not use a gas or diesel engine to drive compressor. Insure that electrical supply available at the work site is adequate to energize motor.
- J. Compressor Location:** Locate compressor outside of building in location that will not impede access to the building, and that will not cause a nuisance by virtue of noise or fumes to occupied portions of the building.
- K. Air Intake:** Locate air intake remotely from any source of automobile exhaust or any exhaust from engines, motors, auxiliary generator or buildings.
- L. After-Cooler:** Provide an after-cooler at entry to filter system which is capable of reducing temperatures to outside ambient air temperatures.
- M. Self Contained Breathing Apparatus (SCBA):** Configure system to permit the recharging of ½ hour 2260 PSI (15.58 MPa) SCBA cylinders.

**PART 3 - EXECUTION**

**3.1 GENERAL:**

- A. Respiratory Protection Program:** Comply with ANSI Z88.2 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.314 and 1926.103.

- B. Require** that respirators be used in the following circumstances:
1. During all Class I asbestos jobs.
  2. During all Class II work where the ACM is not removed in a substantially intact state.
  3. During all Class II and III work, which is not performed using wet methods.
  4. During all Class II and III asbestos jobs where the employer does not produce a "negative exposure assessment".
  5. During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed.
  6. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
  7. During all work covered by this section where employees are exposed above the OSHA PEL (TWA, or excursion limit).
  8. In emergencies. During emergencies where the airborne asbestos fiber concentration is not known, a self-contained breathing apparatus (SCBA) must be used.
- C. Require** that respiratory protection be used at all times that there is any possibility of disturbance of ACM whether intentional or accidental.
- D. Require** that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until the area has been cleared for re-occupancy in accordance with Section "Project Decontamination".
- E. Regardless of Airborne Fiber Levels:** Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.
- F. Do not allow** the use of single-use, disposable, or quarter-face respirators for any purpose.

### 3.2 FIT TESTING:

- A. Initial Fitting:** Provide initial fitting of respiratory protection during a respiratory protection course of training set up and administered by a individual qualified to do fit testing. Fit types and sizes of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing has been provided.
- B. On a Weekly Basis,** check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube.
- C. Upon Each Wearing:** Require that each time an air-purifying respirator is put on it be checked for fit with a positive and negative pressure fit test in accordance with the manufacturer's instructions or ANSI Z88.2.

### 3.3 TYPE OF RESPIRATORY PROTECTION REQUIRED:

- A. General:** After reducing airborne asbestos levels to the lowest feasible level with engineering controls and

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work practices, provide respiratory protection as necessary to ensure that workers are not exposed to an airborne concentration of asbestos in excess of the Specified Permissible Exposure Limits (SPEL) set forth in this Section.

- B. Level of Respiratory Protection:** Determine the proper level of respiratory protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the Specified Permissible Exposure Limits (PEL) set forth in this Section is the minimum level of protection allowed.
- C. Specific Respiratory Protection Requirements:** Provide respiratory protection as indicated below as a minimum requirement:
- 1. Half-face Negative Pressure Air-Purifying Respirators:** Provide half-face negative pressure air-purifying respirators during installation of Critical or Primary Barriers or other activities where there has been an "Initial Exposure Assessment" that has determined that airborne asbestos fiber levels will not exceed 0.1 fiber per cubic centimeter (0.1 f/cc). Provide a PAPR where a half-face negative pressure air-purifying respirator is allowed to any worker who so requests.
  - 2. Powered Air-Purifying Respirators (PAPR):** Provide powered air-purifying respirators (PAPR) during removal of asbestos-containing thermal system insulation (TSI) or surfacing material where there has been an "Initial Exposure Assessment" that has determined that airborne asbestos fiber levels will not exceed 1.0 fiber per cubic centimeter (1.0 f/cc).
  - 3. Type "C" Supplied-air respirators:** full facepiece pressure demand supplied air respirators are to be used by all workers engaged in the removal of thermal system insulation (TSI) or surfacing materials, or demolition of pipes, structures, or equipment covered or insulated with asbestos, or in the removal or demolition of asbestos insulation or coverings, or any other activity which results in or may result in airborne asbestos fiber levels above 1.0 fibers per cubic centimeter (1.0 f/cc).
- D. Provide** a full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus for all workers within a regulated area where Class I work is being performed and for which an initial exposure assessment has not been produced. After an initial exposure assessment is made, use the level of respiratory protection required by that assessment and requirements of this specification and the OSHA Asbestos Construction Standard 29 CFR 1926.1101.

**3.4 SPECIFIED PERMISSIBLE EXPOSURE LIMITS (SPEL):**

- A. Specified Permissible Exposure Limits (SPEL):** Ensure that no worker is exposed to an airborne concentration of asbestos in excess of the Time-Weighted Average (TWA) limit, and Excursion Limit (EL) set forth below.
- 1. Time Weighted Average (TWA) limit** - Concentration of airborne asbestos fibers to which any worker may be exposed as an eight (8) hour time-weighted average (TWA) shall not exceed the following.
    - a. 0.01 fibers per cubic centimeter
  - 2. Excursion Limit (EL)** - Concentration of airborne asbestos fibers to which any worker may be exposed as averaged over a sampling period of thirty (30) minutes shall not exceed the following.
    - a. 0.01 fibers per cubic centimeter

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- B. Fibers:** For purposes of this section, fibers are defined as all fibers regardless of composition as counted in the OSHA Reference Method (ORM), or NIOSH 7400 procedure.
1. **Electron Microscopy:** If Electron Microscopy is used to determine airborne fiber levels, only asbestos fibers will be enumerated, but fibers of any size detected by the testing of Section 01711 Project Decontamination will be counted.

**3.5 RESPIRATORY PROTECTION FACTOR:**

<b>A. Respirator Type</b>	<b>Protection Factor</b>
<b>1. Air purifying:</b> Negative pressure respirator High efficiency filter Half facepiece	10
<b>2. Air purifying:</b> Negative pressure respirator High efficiency filter Full facepiece	50
<b>3. Powered Air Purifying (PAPR):</b> Positive pressure respirator High efficiency filter Half facepiece	50
<b>4. Powered air-purifying respirator</b> equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode. Full facepiece	100
<b>5. Supplied air:</b> Positive pressure respirator Pressure demand or other positive pressure mode Full facepiece Equipped with an auxiliary HEPA cartridge or positive pressure Self-contained breathing apparatus (SCBA) for escape	1,000

**3.6 AIR PURIFYING RESPIRATORS:**

- A. Negative pressure - half or full face mask:** Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the work day. Require that respirators be wet-rinsed, and filters discarded, each time a worker leaves the Work Area. Require that new filters be installed each time a worker re-enters the Work Area. Store respirators and filters at the job site in the changing room and protect totally from exposure to asbestos prior to their use.

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- B. Powered air purifying - half or full face mask:** Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the facepiece decreases to the level at which the manufacturer recommends filter replacement. Require that regardless of flow, filter cartridges be replaced after 40 hours of use. Require that HEPA elements in filter cartridges be protected from wetting during showering. Require entire exterior housing of respirator, including blower unit, filter cartridges, hoses, battery pack, face mask, belt, and cords, be washed each time a worker leaves the Work Area. Caution should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

**3.7 SUPPLIED AIR RESPIRATOR:**

- A. Air Systems Monitor:** Continuously monitor the air system operation including compressor operation, filter system operation, backup air capacity and all warning and monitoring devices at all times that system is in operation. Assign an individual, trained by manufacturer of the equipment in use or by a Certified Industrial Hygienist, in the operation and maintenance of the system to provide this monitoring. Assign no other duties to this individual that will take him away from monitoring the air system.

**END OF SECTION - 02 80 45**

**INITIAL EXPOSURE ASSESSMENT**

Project No: \_\_\_\_\_ Date: \_\_\_\_\_  
 Project Name: \_\_\_\_\_ Facility: \_\_\_\_\_  
 Work Area(s): \_\_\_\_\_

**Reference Job:** \_\_\_\_\_  
 Description of Work: \_\_\_\_\_

Asbestos Containing Materials \_\_\_\_\_ Asbestos/Type Percentage \_\_\_\_\_  
 \_\_\_\_\_

Task	Personal Monitoring Level			Respirator Worn	Comments
	High	Low	Average		
Prep / Set up	_____	_____	_____	_____	_____
Removal of Surface Trt	_____	_____	_____	_____	_____
Removal of TSI	_____	_____	_____	_____	_____
Removal of Misc Mat.	_____	_____	_____	_____	_____
Bag Out	_____	_____	_____	_____	_____
Clean Up	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____
Experience Level of Work Force	_____				

**Reference Job:** \_\_\_\_\_  
 Description of Work: \_\_\_\_\_

Asbestos Containing Materials \_\_\_\_\_ Asbestos/Type Percentage \_\_\_\_\_  
 \_\_\_\_\_

Task	Personal Monitoring Level			Respirator Worn	Comments
	High	Low	Average		
Prep / Set up	_____	_____	_____	_____	_____
Removal of Surface Trt	_____	_____	_____	_____	_____
Removal of TSI	_____	_____	_____	_____	_____
Removal of Misc Mat.	_____	_____	_____	_____	_____
Bag Out	_____	_____	_____	_____	_____
Clean Up	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____
Experience Level of Work Force	_____				

**Expected Conditions of This Job**

Task	Anticipated Level	Respirator	Comments
Prep / Set up	_____ f/cc	_____	_____
Removal of Surface Trt	_____ f/cc	_____	_____
Removal of TSI	_____ f/cc	_____	_____
Removal of Misc Mat.	_____ f/cc	_____	_____
Bag Out	_____ f/cc	_____	_____
Clean Up	_____ f/cc	_____	_____
Other	_____ f/cc	_____	_____
Experience Level of Work Force	_____		



**SECTION 02 80 46 - DECONTAMINATION UNITS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract**, including General and Supplementary Conditions and other Division-2 Specification sections, apply to work of this section.

**1.2 DESCRIPTION OF WORK:**

- A. Provide separate Personnel and Equipment Decontamination facilities.** Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

**1.3 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Refer to Section "Temporary Facilities"** - Asbestos Abatement for electrical requirements and requirements relative to connection of decontamination facilities to building systems such as water, sewer, and electrical.

**1.4 SUBMITTALS**

- A. Before the Start of Work:** Submit the following to the Designer for review. Do not begin work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
  - 1. Personnel Decontamination Unit: Provide shop drawing showing location and assembly of personnel decontamination units.
  - 2. Equipment Decontamination Unit: Provide shop drawing showing location and assembly of equipment decontamination units.
  - 3. Shower Pan: Provide shop drawing.
  - 4. Shower Walls: Provide product data.
  - 5. Shower Head and Controls: Provide product data.
  - 6. Filters: Provide product data and shop drawing of installation on decontamination unit.
  - 7. Hose Bib: Provide product data.
  - 8. Shower Stall: for Wash Down Station provide product data and shop drawing showing and modifications.
  - 9. Elastomeric membrane: Provide product data.
  - 10. Lumber: Provide product data on fire resistance treatment.
  - 11. Sump Pump: Provide product data.
  - 12. Signs: Submit samples of signs to be used.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick, clear, frosted, or black as indicated.
- B. Polyethylene Sheet:** Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.
- C. Reinforced Polyethylene Sheet:** Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.
- D. Duct Tape:** Provide duct tape in 2 inch or 3 inch (51mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.
- E. Spray Adhesive:** Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- F. Shower Pan:** Provide one-piece waterproof shower pan 4 feet x 8 feet x 6 inches deep (102 mm X 204 mm x 152 mm deep). Fabricate from seamless fiberglass minimum 1/16 inch (1.59 mm) thick reinforced with wood, 18 ga. stainless or galvanized steel with welded seams, copper or lead with soldered seams, or a seamless liner of minimum 60 mil (1.5 mm) thick elastomeric membrane.
- G. Shower Walls:** Provide 8 feet (2.44 m) long by approximately 7 feet (2.13 m) high walls fabricated from rigid, impervious, waterproof material, either corrugated fiberglass roofing or equivalent. Structurally support as necessary for stability.
- H. Shower Head and Controls:** Provide a factory-made shower head producing a spray of water which can be adjusted for spray size and intensity. Feed shower with water mixed from hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid.
- I. Filters:** Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.
1. Primary Filter - Passes particles 20 microns and smaller
  2. Secondary Filter - Passes particles 5 microns and smaller
- J. Hose Bib:** Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4 inch (19.05 mm) National Standard male hose outlet.
- K. Shower Stall:** For Wash Down Station provide leak tight shower enclosure with integrated drain pan fabricated from fiberglass or other durable waterproof material, approximately 3 feet x 3 feet (0.91m x 0.91

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m) square with minimum 6 feet (1.83 m) high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4 feet (1.22 m) above drain pan. Connect drain to a reservoir, pump water from reservoir through filters to a drain or store and use for amended water. Mount filters inside shower stall on back wall beneath hose bib.

- L. **Elastomeric membrane:** Provide uniform flat sheets of flexible sheet roofing material fabricated from EPDM (ethylene propylene diene monomers) or Neoprene (polychloroprene), in a nominal 45 mil (1.14 mm) thickness.
- M. **Lumber:** Provide kiln dried lumber of any grade or species.
- N. **Sump Pump:** Provide totally submersible waterproof sump pump with integral float switch. Provide unit sized to pump 2 times the flow capacity of all showers or hoses supplying water to the sump, through the filters specified herein when they are loaded to the extent that replacement is required. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump. Adjust float switch so that a minimum of 3 inch (76 mm) remains between top of liquid and top of sump pan.

**PART 3 - EXECUTION**

**3.1 PERSONNEL DECONTAMINATION UNIT:**

- A. **Provide a Personnel Decontamination Unit** consisting of a serial arrangement of connected rooms or spaces, Changing Room, Drying Room, Shower Room, Equipment Room. Require all persons without exception to pass through this Decontamination Unit for entry into and exiting from the Work Area for any purpose. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 100 foot candles (1076 lumens / sq meter).
- B. **Changing Room (clean room):** Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.
  - 1. Construct using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness, to provide an airtight seal between the Changing Room and the rest of the building.
  - 2. Locate so that access to Work Area from Changing Room is through Shower Room.
  - 3. Separate Changing Room from the building by a sheet plastic flapped doorway.
  - 4. Require workers to remove all street clothes in this room, dress in clean, disposable coveralls, and don respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require Workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.
  - 5. An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workers may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic as set forth in Section 01526 Temporary Enclosures. Authorization for this must be obtained from the Designer in writing prior to start of construction. Submit written request in accordance with Section 01632 "Substitutions" detailing layout and protective measures proposed.
  - 6. Maintain floor of changing room dry and clean at all times. Do not allow overflow water from shower to wet floor in changing room.
  - 7. Damp wipe all surfaces twice after each shift change with a disinfectant solution.
  - 8. Provide posted information for all emergency phone numbers and procedures.
  - 9. Provide 1 storage locker per employee.
  - 10. Provide all other components indicated on the contract drawings.

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- C. Airlock:** Provide an airlock between Drying Room and Changing Room. This is a transit area for workers.
1. Separate this room from Drying Room and Changing Room by sheet plastic flapped doorways.
  2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate this room from the Drying and Changing Rooms with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
- D. Drying Room:** Provide a drying room as an airlock and a place for workers to dry after showering.
1. Construct room by providing a pan continuous with or draining to Shower Room pan. Install a freely draining wooden or non-skid metal floor in pan at elevation of top of pan.
  2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate this room from the Changing Room and Shower Room with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  4. Separate from Changing Room by a sheet plastic flapped doorway.
  5. Provide a continuously adequate supply of disposable bath towels.
  6. Provide a rigid, tight-sealing hinged door between Drying Room and Clean Room. Arrange so that there is a sensible movement of air from clean room through breathing zone of worker in Shower and Drying Room toward Equipment Room.
- E. Shower Room:** Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room.
1. Construct room by providing a shower pan and 2 shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining wooden floor in shower pan at elevation of top of pan.
  2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate this room from the Drying Room and Airlock with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  4. Provide splashproof entrances to Drying Room and Airlock with doors arranged in the following configuration:
    - a. At each entrance to the Shower Room construct a door frame out of nominal 2 inch x 4 inch (51 mm X 102 mm) lumber with 1-1/2 inch (39 mm) jambs (sides) and 1-1/2 inch (39 mm) head (top) and sill (bottom). Attach to this door frame two overlapping flaps of elastomeric membrane material, fastened at the head (top) and jambs (sides) (by clamping between a 1-1/2 inch (39 mm) x 3/4 inch (19mm) batten and frame). Overlap the flaps a minimum of 6 inch (152 mm) in a direction that presents a shingle-like configuration to the water stream from the shower. Overlap sill (bottom) by 1-1/2 inch (39 mm) minimum. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.
  5. Provide shower head and controls.
  6. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower.
  7. Provide a soap dish and a continuously adequate supply of soap and maintain in sanitary condition.
  8. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.
  9. Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the Work Area.
  10. Provide flexible hose shower head.

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11. Pump waste water to drain or to storage for use in amended water. If pumped to drain, provide 20 micron and 5 micron waste water filters in line to drain or waste water storage. Change filters daily or more often if necessary. Locate filters inside shower unit so that water lost during filter changes is caught by shower pan.
  12. Provide hose bib.
  13. Provide all other items indicated on contract drawings.
- F. Airlock:** Provide an airlock between Shower Room and Equipment Room. This is a transit area for workers. Separate this room from Equipment Room by a sheet plastic flap doorway.
1. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  2. Separate this room from the Equipment Room and Shower Room with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate from Equipment Room by a sheet plastic flapped doorway.
- G. Equipment Room (contaminated area):** Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.
1. Separate this room from the Work Area by a 6 mil (0.15 mm) polyethylene flapped doorway.
  2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  4. Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.
- H. Airlock:** Provide an airlock between Equipment Room and Work Area. This is a transit area for workers.
1. Separate this room from Equipment Room and Work Area by a sheet plastic flapped doorways.
  2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
  3. Separate this room from the Equipment Room and Work Area with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
- I. Work Area:** Separate Work Area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the Work Area is expected to be high, as in dry removal, add an intermediate cleaning space between the Equipment Room and the Work Area. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil (0.15 mm) polyethylene per shift change and remove contaminated layer after each shift.
- J. Decontamination Sequence:** Require that all workers adhere to the following sequence when entering or leaving the Work Area.
1. Entering Work Area: Worker enters Changing Room and removes street clothing, puts on clean disposable overalls and respirator, and passes through the Shower Room into the Equipment Room.
  2. Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.
  3. Worker proceeds to Work Area.

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**K. Exiting Work Area:**

1. Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet.
2. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment.
3. Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Equipment Room.
4. Disposable coveralls are placed in a bag for disposal with other material.
5. Require that Decontamination procedures be followed by all individuals leaving the Work Area.
6. After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

**3.2 EQUIPMENT DECONTAMINATION UNIT:**

**A. Provide an Equipment Decontamination Unit** consisting of a serial arrangement of rooms, Clean Room, Holding Room, Wash Room for removal of equipment and material from Work Area. Do not allow personnel to enter or exit Work Area through Equipment Decontamination Unit.

**B. Arrange with airlocks** between rooms as required below.

**C. Wash Down Station:** Provide an enclosed Shower Unit located in Work Area just outside Wash Room as an equipment, bag and container cleaning station.

1. Fabricate waterproof floor extending 6 feet (1.83 m) beyond Wash Down station in all directions. Install seamless waterproof membrane over area and extend over curbs on all four sides. Form curbs from 2 inch x 4 inch (51 X 102 mm) lumber laid on the flat.
2. Waterproof membrane is to be fabricated from elastomeric membrane.
3. Do not allow water to collect on waterproof membrane. Remove continuously with a wet vacuum or mops.

**D. Wash Room:** provide wash room for cleaning of bagged or containerized asbestos-containing waste materials passed from the Work Area.

1. Construct wash room of nominal 2 inch x 4 inch (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that packaged materials, after being wiped clean, can be passed to the Holding Room.
2. Separate this room from the Work Area by a single flapped door of 6 mil (0.15 mm) polyethylene sheeting.
3. Provide a drop cloth layer of plastic on floor in the Wash Room for every load-out operation. Roll this drop cloth layer of plastic from Wash Room into Work Area after each load-out. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

**E. Airlock:** Provide an airlock between Wash Room and Holding Room. This is a transit area.

1. Separate this room from adjacent spaces by a sheet plastic flapped doorway.
2. Separate this room from the rest of the building and adjacent spaces with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

**F. Holding Room:** Provide Holding Room as a drop location for bagged asbestos-containing materials passed from the Wash Room. Construct Holding Room of nominal 2 inch x 4 inch (51 X 102 mm ) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that bagged materials cannot be passed from the Wash Room through the Holding Room to the Clean Room.

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1. Separate this room from the adjacent rooms by flap doors fabricated from 6 mil (0.15 mm) sheet plastic.
- G. Airlock:** Provide an airlock between Holding Room and Clean Room. This is a transit area.
1. Separate this room from adjacent spaces by a sheet plastic flap doorway.
  2. Separate this room from the rest of the building and adjacent spaces with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.
- H. Clean Room:** provide Clean Room to isolate the Holding Room from the building exterior. If possible locate to provide direct access to the Holding Room from the building exterior.
1. Erect Critical and Primary Barriers as described in Section "Temporary Enclosures" in an existing space. If no space exists construct Clean Room of 2 x 4 (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness.
  2. Separate this room from the exterior by a single flap door of 6 mil (0.15 mm) polyethylene sheeting.
- I. Load-out Area:** The load-out area is the transfer area from the building to a truck or dumpster. It may be the Clean Room of the Equipment Decontamination unit or a separate room or loading dock area. Erect Critical and Primary barriers as described in Section "Temporary Enclosures" in load-out area.
1. During transfer of material from load-out area erect primary barriers as described in Section "Temporary Enclosures" as necessary to seal path from load-out area to truck or dumpster.
- J. Decontamination Sequence:** Take all equipment or material from the Work Area through the Equipment Decontamination Unit according to the following procedure:
1. At washdown station, thoroughly wet clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.
  2. When passing equipment or containers into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the doorway between the Washdown Station and the Wash Room. Keep all outside personnel clear of the Equipment Decontamination Unit.
  3. Once inside the washroom, wet clean the bags and/or equipment.
  4. When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Holding room and the Clean Room.
  5. Workers from the building exterior enter Holding Area and remove decontaminated equipment and/or containers for disposal.
  6. Require these workers to wear full protective clothing and appropriate respiratory protection.
  7. At no time is a worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

**3.3 CONSTRUCTION OF THE DECONTAMINATION UNITS:**

- A. Walls and Ceiling:** Construct airtight walls and ceiling using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness. Attach to existing building components or a temporary framework.
- B. Floors:** Use 2 layers (minimum) of 6 mil (0.15 mm) polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.
- C. Flap Doors:** Fabricated from three (3) overlapping sheets with openings a minimum of three feet (3') (0.91 meters) wide. Configure so that sheeting overlaps adjacent surfaces. Weights at bottom of sheets as

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required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') (1.22 meters) between entrance and exit of any room. Provide a minimum of three feet (3') (0.91 meters) between doors to airlocks.

- D. If the Decontamination area** is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/4 inch (6.4 mm) hardboard or 1/2 inch (12.7 mm) plywood "ceiling" with polyethylene sheeting, at least 6 mil (0.15 mm) in thickness covering the top of the "ceiling".
- E. Visual Barrier:** Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/4 inch (6.4 mm) thick hardboard or 1/2 inch (12.7 mm) plywood. Where the solid barrier is provided, sheeting need not be opaque.
- F. Alternate methods** of providing Decontamination facilities may be submitted to the Designer for approval. Do not proceed with any such method(s) without written authorization of the Designer.
- G. Electrical:** Provide subpanel at Changing Room to accommodate all removal equipment. Power subpanel directly from a building electrical panel.
  - 1. Connect all electrical branch circuits in Decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.

**3.4 CLEANING OF DECONTAMINATION UNITS:**

- A. Clean debris and residue** from inside of Decontamination Units on a daily basis or as otherwise indicated on Contract Drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.
- B. If the Changing Room** of the Personnel Decontamination Unit becomes contaminated with asbestos-containing debris, abandon the entire Decontamination Unit and erect a new Decontamination Unit. Use the former Changing Room as an inner section of the new Equipment Room.

**3.5 SIGNS:**

- A. Post** an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:
  - 1. Provide signs in both English and Spanish.
  - 2. Legend:  
DANGER  
ASBESTOS  
MAY CAUSE CANCER  
CAUSES DAMAGE TO LUNGS  
AUTHORIZED PERSONNEL ONLY  
WEAR RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING IN THIS AREA
  - 3. Provide spacing between respective lines at least equal to the height of the respective upper line.



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- B.** Post an approximately 10 inch by 14 (254 mm x 356 mm) inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

1. Provide signs in both English and Spanish.

2. **Legend**

**Notation**

NO FOOD, BEVERAGES OR TOBACCO PERMITTED 3/4 in (19 mm) Block

ALL PERSONS SHALL DON PROTECTIVE CLOTHING (COVERINGS) BEFORE ENTERING THE WORK AREA 3/4 in (19 mm) Block

ALL PERSONS SHALL SHOWER IMMEDIATELY AFTER LEAVING WORK AREA AND BEFORE ENTERING THE CHANGING AREA 3/4 in (19 mm) Block

**END OF SECTION – 02 80 46**

**SECTION 02 82 05 - MATERIALS AND EQUIPMENT - ASBESTOS ABATEMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. **Related Sections:** The following Sections contain requirements that relate to this Section:
1. The Contractor's Construction Schedule is included under Section "Coordination - Asbestos Abatement".
  2. The Contractor's Schedule of Submittals is included under Section "Submittals - Asbestos Abatement".
  3. The applicability of industry standards to products specified is included under Section "Reference Standards and Definitions - Asbestos Abatement".
  4. The administrative procedures for handling requests for substitutions made after award of the Contract is included under Section "Substitutions - Asbestos Abatement".

**1.3 DEFINITIONS**

- A. **Definitions** used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  2. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature that is current as of the date of the Contract Documents.
  3. "Foreign Products" as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
  4. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
  5. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
  6. "Equipment" are products that may be either operational or fixed.

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- a. Operational Equipment are products with operating parts, whether motorized or manually operated, that requires temporary or permanent service connections, such as wiring or piping.
- b. Fixed Equipment are products necessary for accomplishing the work that are used as a temporary facility during the work and removed afterward.

**1.4 SUBMITTALS**

**Required submittals:** A general listing of products requiring submittals is included at the end of Section "Submittals." This listing may not be complete. Submittal requirements are found in each specification section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

**A. Product List:** A list of products required is included at the end of this Section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

**B. Product List:** Prepare a list showing products specified in tabular form acceptable to the Owner's representative. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.
2. Form: Prepare product list with information on each item tabulated under the following column headings:
  - a. Related Specification Section number.
  - b. Generic name used in Contract Documents.
  - c. Proprietary name, model number, and similar designations.
  - d. Manufacturer's name and address.
  - e. Supplier's name and address.
  - f. Installer's name and address.
  - g. Projected delivery date or time span of delivery period.
3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
  - a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.
4. Completed List: Within 10 days after date of commencement of the Work, submit 3 copies of the completed product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
5. Designer's Action: The Designer will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Owner's representative's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

## 1.5 QUALITY ASSURANCE

- A.** Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Owner's representative to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.
- B.** Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
1. The contractor is responsible for providing products and construction methods that are compatible with products and construction methods to be installed after completion of the work of this contract.
  2. If a dispute arises between contractors over concurrently selectable, but incompatible products, the Designer will determine which products shall be retained and which are incompatible and must be replaced.
- C.** Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
1. No available domestic product complies with the Contract Documents.
  2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.
- D.** Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
  2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
    - a. Name of product and manufacturer.
    - b. Model and serial number.
    - c. Capacity.
    - d. Speed.
    - e. Ratings.

## 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A.** Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

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1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

**PART 2 - PRODUCTS**

**2.1 PRODUCT SELECTION**

- A. General Product Requirements:** Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
  2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures:** The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:
1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.
  2. Semi-proprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.
    - a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
  3. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
  4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

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5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.
  - a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
7. Visual Matching: Where Specifications require matching an established Sample, the Designer's decision will be final on whether a proposed product matches satisfactorily.
  - a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category.
8. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Designer will select the color, pattern, and texture from the product line selected.
9. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

**PART 3 - EXECUTION**

**3.1 INSTALLATION OF PRODUCTS**

- A. **Comply with manufacturer's instructions and recommendations** for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
  1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

**END OF SECTION 02 82 05**

**SECTION 02 82 06 - SUBSTITUTIONS - ASBESTOS ABATEMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. **This Section includes** administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. **Related Sections:** The following Sections contain requirements that relate to the Section:
1. **Section “Reference Standards and Definitions - Asbestos Abatement”** specifies the applicability of industry standards to products specified.
  2. **Section “Coordination - Asbestos Abatement”** specifies requirements for submitting the Contractor’s Construction Schedule.
  3. **Section “Submittals - Asbestos Abatement”** specifies requirements for submitting the Submittal Schedule.
  4. **Section “Materials and Equipment - Asbestos Abatement”** specifies requirements governing the Contractor’s selection of products and product options.

**1.3 DEFINITIONS**

- A. **Definitions** in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. **Substitutions:** Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
  2. Revisions to the Contract Documents requested by the Owner or Designer.
  3. Specified options of products and construction methods included in the Contract Documents.
  4. The Contractor’s determination of and compliance with governing regulations and orders issued by governing authorities.

**1.4 SUBMITTALS**

- A. **Substitution Request Submittal:** The Designer will consider requests for substitution if received within 10 days after commencement of the Work. Requests received more than 10 days after commencement of the

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Work may be considered or rejected at the discretion of the Designer.

1. Submit electronic copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
  - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate the proposed substitution.
  - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
  - c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
  - d. Samples, where applicable or requested.
  - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
  - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
  - g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
  - h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
4. Designer's Action: If necessary, the Designer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Designer will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.
  - a. Use the product specified if the Designer cannot make a decision on the use of a proposed substitute within the time allocated.

**PART 2 - PRODUCTS**

**2.1 SUBSTITUTIONS**

- A. Conditions:** The Designer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Designer. If the following conditions are not satisfied, the Designer will return the requests without action except to record noncompliance with these



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requirements.

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The request is timely, fully documented, and properly submitted.
4. The specified product or method of construction cannot be provided within the Contract Time.
5. The Designer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
6. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.
7. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Designer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
8. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
9. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
10. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
11. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

- B. The Contractor's submittal** and the Designer's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

**PART 3 - EXECUTION** (Not Applicable)

**END OF SECTION 02 82 06**

**SECTION 02 82 08 - PROJECT DECONTAMINATION**

**PART 1 - GENERAL**

**1.1 SUMMARY:**

- A. Work of This Section** includes the decontamination of air in the Work Area which has been, or may have been, contaminated by the elevated airborne asbestos fiber levels generated during abatement activities, or which may previously have had elevated fiber levels due to friable asbestos-containing materials (ACM) in the space.
- B. Work of This Section** includes the cleaning, decontamination, and removal of temporary facilities installed prior to abatement work, including:
  - 1. Primary and Critical Barriers
  - 2. Decontamination Unit
  - 3. Pressure Differential System
- C. Work of This Section** includes the cleaning, and decontamination of all surfaces (ceiling, walls, floor) of the Work Area, and all furniture or equipment in the Work Area.

**1.2 RELATED DOCUMENTS:**

- A. Drawings and general provisions of the Contract**, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

**1.3 DESCRIPTION OF REQUIREMENTS:**

- A. General: Decontamination** of the Work Area following asbestos abatement.
- B. If the asbestos abatement work is on damaged or friable materials** the work is a four step procedure with two cleanings of the Primary Barrier plastic prior to its removal and two cleanings of the room surfaces to remove any new or existing contamination. Unless specifically indicated otherwise all materials are considered damaged or friable for purposes of this section.
- C. If the asbestos abatement work is on undamaged and non-friable materials** the decontamination procedure is a two step procedure with two cleanings of the Primary Barrier plastic to remove contamination, thus preventing contamination of the building when the Work Area isolation barriers are removed.
- D. In both cases** operation of the pressure differential system is used to remove airborne fibers generated by the abatement work.

**1.4 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Removal of Gross Debris** is integral with the performance of abatement work and as such is specified in Section "Resilient Flooring Removal – Aggressive Asbestos Abatement".

**1.5 CLEARANCE AIR SAMPLING BY THE OWNER:**

- A. To determine** if the elevated airborne asbestos structure concentration encountered during abatement operations has been reduced to the specified level, the Owner will secure samples and analyze them.

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according to the following procedures.

1. Aggressive sampling procedures as described below will be followed.
2. TEM samples will be secured and analyzed as indicated below.
3. Work Area Clearance: upon meeting the TEM Clearance requirements the work of Section Project Decontamination can continue.

**1.6 AGGRESSIVE SAMPLING BY THE OWNER:**

**A. All Air Samples** will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower (746 watts) electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10,000 (283 cubic meters) cubic feet of room volume.
2. One 20 inch (508 mm) diameter fan per 10,000 cubic feet (283 cubic meters) of room volume will be mounted in a central location at approximately 6 feet-6 inches (2 meters) above floor, directed toward ceiling and operated at low speed for the entire period of sample collection. Contractor shall provide leaf blower, fans, and electrical cords required for aggressive sampling.
3. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors or vents.
4. After air sampling pumps have been shut off, fans will be shut off.
5. In work areas where a dirt floor or exposed fibrous glass insulation is in the space, but outside the work area, maintain a critical barrier to prevent disturbance of these surfaces during aggressive sampling.

**NOTE:** The Contractor shall provide all fans, leaf blowers, and extension cords necessary to complete aggressive sampling.

**1.7 SCHEDULE OF CLEARANCE AIR SAMPLES BY OWNER:**

**A. Sample cassettes:** Samples will be collected on 25 mm. cassettes as follows:

1. **TEM:** 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

**B. Number and Volume of Samples:** The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner may vary depending upon job conditions. Contractor shall make all efforts to construct work area enclosures in such a manner that minimizes the number of work area containments required for clearance while including all building work areas where clearance sampling is required.

**C. Sampling sensitivity:**

1. **TEM:** Analytical Sensitivity as set forth in the analytical method used or the AHERA regulation.

**1.8 TRANSMISSION ELECTRON MICROSCOPY:**

- A. In each Work Area** after completion of all cleaning work, a minimum of 7 samples will be taken and analyzed as follows:

Location Sampled	Number of Samples	Analytical Sensitivity Struct/cc	Approx. Volume (L)	Approx. Flow (LPM)
Each Work Area	5	0.005	1,300-1,800	1-15
Work Area Blank	1	0.005	0	Open for 30 Seconds
Laboratory Blank	1	0.005	0	Do Not Open

- B. Analysis** will be performed using the analysis method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.
- C. Asbestos Structures** referred to in this Section include asbestos fibers, bundles, clusters or matrices, as defined by method of analysis.
- D. Release Criteria:** Asbestos Decontamination of the work site is complete if the following conditions are met:
- 1. Work Area Samples are below filter background levels**
    - a. All Work Area sample volumes are greater than 1,199 liters for a 25 mm. sampling cassette.
    - b. The average concentration of asbestos of the five Work Area Samples does not exceed the filter background level of 70 structures per square millimeter of filter area.
- E. If these conditions are not met** then the decontamination is incomplete, repeat the cleaning procedures of this section. If work area release criteria are not met, the Contractor shall be responsible for the cost of any failed clearance tests (including analytical costs and air monitoring fees).
- F. Termination of Analysis:** if the arithmetic mean (average) asbestos concentration on the blank filters exceeds 70 structures per square millimeter of filter area the analysis will cease and new samples collected.
- G. Termination of Analysis:** if the sample media are overloaded, the analysis will cease and new samples shall be collected.

**1.9 LABORATORY TESTING BY THE OWNER:**

- A. Transmission Electron Microscopy by the Owner:**
- 1. Samples will be sent by overnight courier as required** for analysis by Transmission Electron Microscopy. Samples will not be carried on weekends, so that samples shipped on Friday will arrive on the following Monday. Verbal results will normally be available during the 5th working day after receipt of samples by the laboratory. The laboratory is capable of analyzing a maximum of 13 such samples from this project at any one time. All Transmission Electron Microscopy results will be

available to the Contractor.

2. **Submit with bid unit cost** for each day of waiting beyond that set forth in the paragraph above.

**1.10 SUBMITTALS:**

- A. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal is returned for "Unrestricted Use" or "Final but Restricted Use."
  1. Submit test report from an independent testing laboratory on the fire resistance rating of the assembly of the spray back fireproofing on the lock-back sealer used.
- B. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been "Received - Not Reviewed."
  1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
    - a. "Lock-Back," sealer.

**PART 2 - PRODUCTS (NOT APPLICABLE)**

**PART 3 - EXECUTION**

**3.1 START OF WORK:**

- A. **Previous Work:** During completion of the asbestos abatement work specified in other sections, the Secondary Barrier of polyethylene sheeting will have been removed and disposed of along with any gross debris generated by the asbestos abatement work.
- B. **Visual inspection:** Perform visual inspections of the work area along with the Project Administrator at each step of the decontamination process.
  1. Follow inspection procedures in the American Society for Testing and Material (ASTM) standard for visual inspections, ASTM E1368.
- C. **Start of Work:** Work of this section begins with the cleaning of the Primary Barrier. At start of work the following will be in place:
  1. Primary Barrier: Two layers of polyethylene sheeting on floor and one layer on walls.
  2. Critical Barrier: An airtight barrier between the Work Area and other portions of the building or the outside.
  3. Critical Barrier Sheeting: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers and other openings.
  4. Decontamination Units: For personnel and equipment in operating condition.
  5. Pressure Differential System: In operation.

**3.2 FIRST CLEANING:**

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- A. First Cleaning:** Carry out a first cleaning of all surfaces of the work area including items of remaining sheeting, tools, scaffolding and/or staging by use of damp-cleaning and mopping, and/or a High Efficiency Particulate Air (HEPA) filtered vacuum. (Note: A HEPA vacuum may fail if used with wet material.) Do not perform dry dusting or dry sweeping. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.
1. Remove All Filters in Air Handling System(s) and dispose of as asbestos-containing waste in accordance with requirements of Section "Disposal of Regulated Asbestos-Containing Material".
  2. After the surfaces have passed a visual inspection verifying that all debris and residue has been removed from the sheet plastic, allow a waiting period that is long enough for the HEPA-filtered fan units operating in the work area to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain Pressure Differential System in operation.

### 3.3 SECOND CLEANING:

- A. Second Cleaning:** Carry out a second cleaning of all surfaces in the work area in the same manner as the first cleaning.
- B. Visual inspection:** Before the application of any sealer to abated surfaces as a lock-back, perform a visual inspection to determine if all ACM including debris and residue has been removed. Perform visual inspections along with Project Administrator. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Administrator. After this visual inspection is passed, lock-back sealants can be applied and the work area decontamination process can be initiated.
- C. Sealing of substrate:** Perform sealing of substrate or installation of spray-applied finishes or fireproofing, where required, at this time. Maintain Pressure Differential System in operation during encapsulation work. Perform work only after meeting the following requirements:
1. Surfaces to be covered with sealer have met the requirements for a visual inspection in this section.
  2. Airborne fiber counts in the Work Area are at or below 0.01 fibers per cubic centimeter as measured by phase contrast microscopy.
- D. Removal of Primary Barriers:**
1. Immediately following the second cleaning of the Primary plastic, remove all Primary Barrier sheeting and Material Decontamination Unit, if there is one, leaving only:
    - a. Critical Barrier: Which forms the sole barrier between the Work Area and other portions of the building or the outside.
    - b. Critical Barrier Sheeting: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers, and other openings.
    - c. Decontamination Unit: For personnel, in operating condition.
    - d. Pressure Differential System: Maintain in continuous operation.

### 3.4 THIRD CLEANING:

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- A. Third cleaning:** Carry out a third cleaning of all surfaces in the work area in the same manner as the first cleaning immediately after removal of Primary plastic. This cleaning is now being applied to existing room surfaces. Take care to avoid water marks or other damage to surfaces.
- B. Contractor's Testing:** At the completion of the above cleaning visually inspect all surfaces. Reclean if any dust, debris, etc. is found. At completion of this inspection sweep entire Work Area including walls, ceilings, ledges, floors and other surfaces in the Work Area with exhaust from forced-air equipment (leaf blower with approximately 1 horsepower (745.7 watts ) electric motor or equivalent). Do not direct forced-air equipment at any seal in any Critical Barrier. If any debris or dust is found repeat the cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced-air equipment.
1. Cover carpeting in the work area with 6 mil (0.15 mm) polyethylene during Contractor's testing procedures. Seal plastic to baseboards with duct tape.
- C. Cleaning Carpeting:** At the completion of cleaning of all surfaces except carpeting, HEPA vacuum carpeting designated to remain in Work Areas using a floor cleaning attachment adjusted so that rubber skirting is in contact with carpet surface. Use a passive (non-power brush type) floor attachment with rubber floor seals and adjustable above-floor height. Completely clean carpeting in one direction with each pass of the floor attachment overlapping the previous pass by one-half the attachment width. At the completion of one such cleaning, vacuum clean in the same manner in a direction at right angles to the initial cleaning. Perform a visual inspection of the carpet at the completion of cleaning, in accordance with inspection standards of the American Society for Testing and Material (ASTM) standard for visual inspections, ASTM E1368.
- D. After a visual inspection,** again wait for a period of time long enough for the HEPA-filtered fan units operating in the work area to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain pressure differential system in operation.

**3.5 FINAL CLEANING:**

- A. Final Cleaning:** Carry out a final cleaning of all surfaces in the Work Area in the same manner as the previous cleaning.
- B. Contractor's Testing:** At the completion of the above cleaning visually inspect all surfaces. Reclean if any dust, debris, etc. is found. At completion of this inspection sweep entire Work Area including walls, ceilings, ledges, floors and other surfaces in the Work Area with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). Do not direct forced air equipment at any seal in any critical barrier. If any debris or dust is found repeat the final cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced air equipment.
- C. After a visual inspection,** again wait for a period of time long enough for the HEPA-filtered fan units operating in the work area to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain pressure differential system in operation.

**3.6 VISUAL INSPECTION:**

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- A. After Final Cleaning Perform a Complete Visual Inspection** of the entire Work Area including: all surfaces, ceiling, walls, floor, decontamination unit, all plastic sheeting, seals over ventilation openings, doorways, windows, and other openings; look for debris from any source, residue on surfaces, dust or other matter. During visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Administrator.
- B. Temporary lighting:** Provide a minimum of 100 foot candles (1075 Lumens / sq meter) of lighting on all surfaces in the areas to be subjected to visual inspection. Provide hand held lights providing 150 foot candles (1600 lumens / sq meter ) at 4 feet ( 1.25 meters) capable of reaching all locations in work area.
- C. Lifts:** Provide ladders, scaffolding, and lifts as required to provide access to all surfaces in the area to be subjected to visual inspection. Access is to allow touching of all surfaces.

**3.7 CLEARANCE AIR SAMPLING BY OWNER (TEM):**

- A. Transmission Electron Microscopy (TEM):** After the work area is found to be visually clean by Contractor's inspection and testing, TEM air samples will be collected and analyzed by the Owner in accordance with the procedure for Transmission Electron Microscopy set forth in Part 1 of this section. Contractor shall contact Designer 48 hours prior to requesting TEM clearance air sampling.
  - 1. If Release Criteria are not met, repeat Final Cleaning and continue Decontamination procedure from that point.
  - 2. If Release Criteria are met, remove work area isolation in accordance with requirements of this section.
- B.**
  - 1. If Release Criteria are not met, repeat Final Cleaning and continue Decontamination procedure from that point.
  - 2. If Release Criteria are met, remove work area isolation in accordance with requirements of this section.

**NOTE:** The Contractor shall compensate the Owner for the costs of failed clearance sampling and associated fees, including but not limited to: laboratory analytical fees, shipping fees, air monitoring technician mileage, air monitoring technician time on site related to air monitoring, air monitoring technician travel time, air monitoring cassettes, per diem, lodging, and pump rental.

**3.8 LOCK-BACK:**

- A. Encapsulation of substrate:** Perform encapsulation of substrate or installation of spray-applied finishes or fireproofing, where required, before Removal of Work Area Isolation as specified below. Maintain Pressure Differential System in operation during encapsulation work.

**3.9 REMOVAL OF WORK AREA ISOLATION:**

- A. After all requirements of this section** have been met:

- 1. Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA



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vacuums and similar equipment with 6 mil (0.15 mm) polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

2. Remove Personnel Decontamination Unit.
3. Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Designer, are found then the entire area affected shall be decontaminated as specified in Cleaning and Decontamination Procedures.
4. Remove all equipment, materials, debris from the work site.
5. Dispose of all asbestos-containing waste material as specified in Section "Disposal of Regulated Asbestos Containing Material".

**4.0 SUBSTANTIAL COMPLETION OF ABATEMENT WORK:**

**A. Abatement Work is Substantially Complete** upon meeting the requirements of this section including submission of:

1. Certificate of Visual Inspection.
2. Receipts Documenting proper disposal as required by Section "Disposal of Regulated Asbestos-Containing Material".
3. Punch list detailing repairs to be made and incomplete items.

**4.1 CERTIFICATE OF VISUAL INSPECTION:**

**A. Following this section is a "Certificate of Visual Inspection".** This certification is to be completed by the Contractor and certified by the Project Administrator. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

**END OF SECTION - 02 82 08**

**CERTIFICATION OF VISUAL INSPECTION**

In accordance with Section "Project Decontamination" the Contractor hereby certifies that he has visually inspected the Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, Decontamination Unit, sheet plastic, etc.) and has found no dust, debris or residue.

by: (Signature)\_\_\_\_\_ Date\_\_\_\_\_

(Print Name)\_\_\_\_\_

(Print Title)\_\_\_\_\_

**PROJECT ADMINISTRATOR CERTIFICATION**

The Project Administrator hereby certifies that he has accompanied the Contractor on the Contractor's visual inspection and verifies that this inspection has been thorough and to the best of their knowledge and belief, the Contractor's Certification above is a true and honest one.

by: (Signature)\_\_\_\_\_ Date\_\_\_\_\_

(Print Name)\_\_\_\_\_

(Print Title)\_\_\_\_\_

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**SECTION 02 82 33 - REMOVAL OF ASBESTOS-CONTAINING MATERIALS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract**, including General and Supplementary Conditions and Division - 02 Specification Sections, apply to work of this section.

**1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Worker Protection** requirements are set forth in Section - Worker Protection - Asbestos abatement.
- B. Installation of Critical and Primary Barriers**, and Work Area Isolation Procedures are set forth in Section - Temporary Enclosures.
- C. Project Decontamination** procedures after removal of the Secondary Barrier are specified in Section - Project Decontamination.
- D. Disposal of asbestos-containing waste** is specified in Section - Disposal of Regulated Asbestos-Containing Material.

**1.3 SUBMITTALS:**

- A. Before Start of Work:** Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use.
- 1. Surfactant:** Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.
  - 2. Removal Encapsulant:** Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.
  - 3. NESHAP Certification:** Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet Asbestos-Containing Materials (ACM) to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).
- B. Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been "Received - Not Reviewed."
- 1. Material Safety Data Sheet:** Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
    - a. Surfactants.
    - b. Encapsulants.

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- c. Solvents.

**PART 2 - PRODUCTS:**

**2.1 MATERIALS**

- A. Wetting Materials:** For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:
- B. Amended Water:** Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.
- C. Removal Encapsulant:** Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether in five gallons (19 liters) of water.
- D. Polyethylene Sheet:** A single polyethylene film in the largest sheet size practicable to minimize seams, 6.0 mil (0.15 mm) thick clear, frosted, or black as indicated.
- E. Polyethylene Sheet:** Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated.
- F. Duct Tape:** Provide duct tape in 2 inch or 3 inch (50mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.
- G. Spray Cement:** Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- H. Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled as required by Section - Disposal of Regulated Asbestos Containing Material.
- I. Fiberboard Drums:** Provide heavy duty leak tight fiberboard drums with tight sealing locking metal tops.
- J. Paper board Boxes:** Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.
- K. Felt:** Standard felt approximately 1/16 inch (1.6 mm) thick and 36 inches (900 mm) to 72 inches (1800 mm) in width.

**PART 3 - EXECUTION**

**3.1 SECONDARY BARRIER:**

- A. Secondary Barrier:** Over the Primary Barrier, install as a drop cloth a clear 6 mil (0.15 mm) sheet plastic in all areas where asbestos removal work is to be carried out, except work areas where floor tile/mastic and/or carpet removal is required. Completely cover floor with sheet plastic. Where the work is within 10 feet (3 m) of a wall extend the Secondary Barrier up wall to ceiling. Support sheet plastic on wall with duct tape, seal top of Secondary plastic to Primary Barrier with duct tape so that debris is unable to get behind it. Provide cross strips of duct tape at wall support as necessary to support sheet plastic and prevent its falling during removal operations.
1. **Install Secondary Barrier** at the beginning of each work shift. Install only sufficient plastic for work of that shift.
  2. **Remove Secondary Barrier** at end of each work shift or as work in an area is completed. Fold plastic toward center of sheet and pack in disposal bags. Keep material on sheet continuously wet until bagged.
  3. **Install Walkways** of black 6 mil (0.15 mm) plastic between active removal areas and decontamination units to protect Primary Layer from tracked material. Install walkways at the beginning of, and remove at the end of, each work shift.

**3.2 WORKER PROTECTION:**

- A. Before beginning work** with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

**3.3 WET REMOVAL:**

- A. Thoroughly wet** to satisfaction of Designer ACM to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water or removal encapsulant to penetrate material thoroughly. If amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions. Perforate outer covering of any installation which has been painted and/or jacketed in order to allow penetration of amended water or removal encapsulant, or use injection equipment to wet material under the covering. Where necessary, carefully strip away while simultaneously spraying amended water or removal encapsulant on the installation to minimize dispersal of asbestos fibers into the air.
1. **Mist work area continuously** with amended water whenever necessary to reduce airborne fiber levels.
  2. **Remove saturated ACM** in small sections from all areas. Do not allow material to dry out. As it is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend

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over and seal with minimum three wraps of duct tape. Clean outside and move to Wash Down Station adjacent to Material Decontamination Unit.

3. **Evacuate air from disposal bags** with a HEPA filtered vacuum cleaner before sealing.
- B. Not Used.**
- C. Not Used.**
- D. Pipe Insulation:** Spray with a mist of amended water or removal encapsulant. Allow amended water or removal encapsulant to saturate material to substrate. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cut bands holding preformed pipe insulation, slit jackets at seams, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks and hand place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with stiff bristle nylon hand brush. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6" (150 mm) from the point where it contacts the asbestos-containing insulation.

**3.4 NOT USED.**

**3.5 LOCALIZED CONTROL OF MATERIAL RELEASE:**

- A. Pipe Insulation:** HEPA vacuum surface of pipe insulation. Cut bands holding preformed pipe insulation, slit jackets at seams while holding HEPA vacuum under cut, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks, using nozzle of HEPA vacuum to collect debris generated, and hand-place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with wire brush. Brushing toward the nozzle of a HEPA vacuum. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6 inches (150 mm) from the point where it contacts the asbestos-containing insulation. Use a two worker crew for work, with one worker removing material and one worker holding the nozzle of a HEPA vacuum in the location of disturbance.

**3.6 NOT USED.**

**3.7 NOT USED.**

**END OF SECTION 02 82 33**

**SECTION 02 82 35 - DISPOSAL OF REGULATED ASBESTOS-CONTAINING MATERIAL**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract**, including General and Supplementary Conditions and Division-2 Specification Sections, apply to work of this section.

**1.2 RELATED WORK SPECIFIED ELSEWHERE:**

- A. Worker protection requirements** are set forth in Section Worker Protection - Asbestos abatement
- B. Section Codes, Regulations and Standards - Asbestos Abatement** describes applicable federal, state and local regulations.

**1.3 DESCRIPTION OF THE WORK:**

- A. This section describes the disposal of Regulated Asbestos-Containing Materials (RACM).** Disposal includes packaging of Regulated Asbestos-Containing Materials. Disposal may be accomplished either by land filling or converting Regulated Asbestos Containing Materials to non Asbestos waste.

**1.4 SUBMITTALS:**

- A. Before Start of Work:** Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use.
  - 1. Copy of state or local license** for waste hauler.
  - 2. Name and address of landfill** where Regulated Asbestos Containing Materials are to be buried. Include contact person and telephone number.
  - 3. Name and address of processor** where Regulated Asbestos-Containing Materials are to be processed into non-asbestos waste if conversion of waste is the disposal method used. Include contact person and telephone number. Also provide the following information about the process and operation used by the processor:
    - a. Results of start-up performance testing and performance testing for last 90 days including operating parameters, feed characteristics, and analysis of output materials.
    - b. Results of composite analysis required during initial 90 days of operation and results of composite analysis of monthly product composite samples for last 90 days.
    - c. Results of continuous monitoring and logs of process operating parameters for the initial 90 days and last 90 days of operation.
    - d. A description of any deviation from the operating parameters established during performance testing, the duration of the deviation, and steps taken to correct the deviation.
    - e. Product data on process to be used
  - 4. Chain of Custody form** and form of waste manifest proposed
  - 5. Sample of disposal bag** and any added labels to be used.

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- B. On a weekly basis** submit copies of all manifests and disposal site receipts to Designer.
- C. Waste Shipment Record:** Maintain a waste shipment record as required by the NESHAP regulation which indicates the waste generator, transporter, and disposal site, and which describes the nature, size, type of container, and form of asbestos waste. Submit to Designer within 35 days of departure from building.

**PART 2 - PRODUCTS:**

**2.1 MATERIALS**

- A. Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled with three labels with text as follows:
  - 1. First Label:** Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:

DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD  
BREATHING AIRBORNE FIBERS IS  
HAZARDOUS TO YOUR HEALTH

- 2. Second Label:** Provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances  
RQ-ASBESTOS WASTE  
CLASS 9  
NA2212-PG III
  - 3. Third Label:** Provide the name of the waste generator (Owner's name), the location from which the waste was generated and the names and addresses of the contractor and transporter. This label must be durable, able to repel dirt and moisture (e.g., permanent marker). Label must be placed directly on disposal bag(s) in a legible format. **Peel and stick type labels are expressly prohibited.**

**2.2 VITRIFICATION:**

- A. If conversion is used, convert Regulated Asbestos-Containing Materials to non-asbestos waste** by thermal conversion in a process including the following principal elements. Comply with all EPA and DOT requirements for asbestos waste until the waste is converted:
  - 1. Receiving and storage:** areas that are maintained as contained controlled areas isolated by physical barriers and a pressure differential
  - 2. Melting:** process that is intrinsically safe in that it will not allow unconverted asbestos to appear in the final product under any circumstances
- B. Processor:** Use a processor that meets all the requirements of the EPA NESHAP regulation for an operation that converts regulated asbestos-containing material and asbestos-containing waste material into non-asbestos (asbestos-free) material as set forth in 40 CFR 61 Sub-part A and M section 61.155
- C. Available Processors:** Subject to compliance with requirements, providers of processes include, but are



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not limited to, the following:

- D. Processors:** Subject to compliance with requirements, utilize process provided by one of the Following:
1. GTS Duratek  
8955 Guilford Rd, Suite 200  
Columbia, MD 21045  
(800) 638-3838
  2. Penberthy Electromelt  
631 So. 96th Street  
Seattle, WA 98108

**PART 3 - EXECUTION**

**3.1 SEQUENCE**

- A. Comply with the following sections** during all phases of this work:
1. Section Worker Protection - Asbestos Abatement
  2. Section Respiratory Protection

**3.2 GENERAL:**

- A. All waste** is to be hauled by a waste hauler with all required licenses from all state and local authority with jurisdiction.
- B. Liquid waste:** Mix all liquid asbestos-containing waste or asbestos contaminated waste with a bladeable material so that it forms a bladeable (non-liquid) form, and have the concurrence of the landfill operator prior to disposal.
- C. Load all adequately wetted Regulated Asbestos-Containing Material** in disposal bags or leak-tight containers. All materials are to be contained in one of the following:
1. **Two 6 mil (0.15 mm) disposal bags** or
  2. **Two 6 mil (0.15 mm) disposal bags and a fiberboard drum** or
  3. **Sealed steel drum** with no bag
- D. Protect interior of truck** or dumpster with Critical and Primary Barriers as described in Section "Temporary Enclosures".
- E. Carefully load containerized waste** in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.
- F. Warning Signs:** During loading and unloading mark dumpsters, receptacles and vehicles with a sign complying with requirements of the EPA NESHAP regulation (40 CFR Part 61), in a manner and location that a person can read the following legend :

DANGER  
ASBESTOS DUST HAZARD  
CANCER AND LUNG DISEASE HAZARD  
Authorized Personnel Only

- G. Do not store containerized materials outside of the Work Area.** Take containers from the Work Area directly to a sealed truck or dumpster.
- H. Do not transport disposal bagged materials on open trucks.** Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as Regulated Asbestos-Containing Material and dispose of in accordance with this specification.
- I. Advise the landfill operator or processor, at least ten days in advance of transport, of the quantity of material to be delivered.**
- J. At disposal site** unload containerized waste:
- 1. At a disposal site,** sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for rebagging. Clean entire truck and contents using procedures set forth in section Project Decontamination.
  - 2. At a processing site** truck and loading dock are arranged as a controlled work area and containerized waste is transferred to storage area by site personnel. All bags including broken ones will be transferred. Clean truck, using procedures set forth in section Project Decontamination.
- K. Retain receipts from landfill or processor** for materials disposed of.
- L. At completion of hauling** and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Designer.

**END OF SECTION - 02 82 35**

**SECTION 02 82 70 - CONTRACT CLOSEOUT - ASBESTOS ABATEMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 2 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. **This Section includes** administrative and procedural requirements for contract closeout including, but not limited to, the following:
1. Inspection procedures.
  2. Project record document submittal.
  3. Submittal of warranties.
  4. Final cleaning.

**1.3 SUBSTANTIAL COMPLETION**

- A. **Preliminary Procedures:** Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
5. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
    - a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
  6. Advise the Owner of pending insurance changeover requirements.
  7. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
  8. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  9. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
  10. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
  11. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
  12. Complete final cleanup requirements, including touch up painting.

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13. Touch up and otherwise repair and restore marred, exposed finishes.

**B. Inspection Procedures:** On receipt of a request for inspection, the Designer will either proceed with inspection or advise the Contractor of unfilled requirements. The Designer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Designer will repeat inspection when requested and assured that the Work is substantially complete.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

#### 1.4 FINAL ACCEPTANCE

**A. Preliminary Procedures:** Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Designer's final inspection list of items to be completed or corrected, endorsed and dated by the Designer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Designer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit a final liquidated damages settlement statement.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

**B. Reinspection Procedure:** The Designer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Designer.

1. Upon completion of reinspection, the Designer will prepare a certificate of final acceptance. If the Work is incomplete, the Designer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

#### 1.5 RECORD DOCUMENT SUBMITTALS

**A. General:** Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Designer's reference during normal working hours.

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- B. Record Drawings:** Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
  2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
  3. Note related change-order numbers where applicable.
  4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
- C. Record Specifications:** Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
  2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
  3. Note related record drawing information and Product Data.
  4. Upon completion of the Work, submit record Specifications to the Designer for the Owner's records.
- D. Record Product Data:** Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
  2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
  3. Upon completion of markup, submit complete set of record Product Data to the Designer for the Owner's records.
- E. Miscellaneous Record Submittals:** Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Designer for the Owner's records.

All submittals required for project closeout shall be electronic format, latest version of Microsoft Word, Microsoft Excel, or Adobe Acrobat, and transmitted electronically (via email or CD-ROM).

**PART 2 - PRODUCTS** (Not Applicable)

**PART 3 - EXECUTION**

**3.1 FINAL CLEANING**

- A. General:** The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls." The cleaning in this Section is in addition to cleaning which is part of decontamination work. This section is intended to return the facility to the Owner in presentable condition.
- B. Cleaning:** Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
    - a. Remove labels that are not permanent labels.
    - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials.
    - c. Replace chipped or broken glass and other damaged transparent materials.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
    - e. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
    - f. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
- C. Removal of Protection:** Remove temporary protection and facilities installed for protection of the Work during construction.
- D. Compliance:** Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

**END OF SECTION 02 82 70**