

PROJECT MANUAL

FOR

**DEMOLITION OF FORMER OSTERVILLE BAY SCHOOL AND OSTERVILLE
COMMUNITY CENTER GYM**

HYANNIS, MASSACHUSETTS

TOWN OF BARNSTABLE



Technical Specifications

May 5, 2017

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CBI JOB NO.: 16165-A

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DEMOLITION OF FORMER OSTERVILLE

BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER **# OF PAGES**

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TECHNICAL SPECIFICATIONS

SECTION 00 85 10

DRAWING LIST

GENERAL

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C-1.0 SITE DEMOLITION PLAN: BASE BID AND ADD ALTERNATE 1

C-2.0 EROSION AND SEDIMENTATION CONTROL PLAN

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HA-02 ASBESTOS ABATEMENT PLAN FIRST FLOOR

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HA-04 ASBESTOS ABATEMENT PLAN ELEVATIONS

HA-05 ASBESTOS ABATEMENT PLAN GYM: ADD ALTERNATE 1

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ARCHITECTURAL DEMOLITION

D1-01 SCHOOL-BASEMENT DEMOLITION PLAN

D1-02 SCHOOL-FIRST FLOOR DEMOLITION PLAN

D1-03 SCHOOL-ATTIC DEMOLITION PLAN

D1-04 SCHOOL-ROOF DEMOLITION PLAN

D1-05 SCHOOL-BUILDING DEMOLITION ELEVATIONS

D1-06 SCHOOL-EXISTING CONDITION PHOTOS

D2-01 GYM-DEMOLITION FLOOR AND ROOF PLANS: ADD ALTERNATE 1

D2-02 GYM-DEMOLITION ELEVATIONS: ADD ALTERNATE 1

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DRAWING LIST

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REFERENCE DRAWINGS

R1-01	SCHOOL-REFERENCE BASEMENT FLOOR PLAN
R1-02	SCHOOL-REFERENCE FIRST FLOOR PLAN
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R1-04	SCHOOL-REFERENCE BUILDING ELEVATIONS
R1-05	SCHOOL-INTERIOR ELEVATIONS
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R2-03	GYM-REFERENCE ROOF PLAN, SECTION AND DETAILS: ADD ALTERNATE 1
R2-04	GYM-REFERENCE WALL SECTIONS: ADD ALTERNATE 1
R2-04	GYM-REFERENCE DETAILS: ADD ALTERNATE 1
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DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 01 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 DESCRIPTION OF WORK - GENERAL

- A. In general, the Contractor shall supply all material, labor, equipment, insurance, temporary protection, tools and appliances necessary for the proper completion of the work as described in the Plans and Specifications, in accordance with good construction practice, and as required by the materials manufacturers.
- B. Supply all shoring and protection necessary to protect the occupants, building area, building systems, and landscape areas. All means and methods are the responsibility of the contractor. The Contractor is solely responsible for safety on the job site.
- C. In General, the work includes, but is not limited to:
 - 1. **Osterville Bay School Demolition**
 - a. Completely remove and dispose of the entire school building in its entirety, including all hazardous materials including asbestos and lead paint, foundations and all utilities. Site utilities to be cut and capped in advance of the demolition.

SUMMARY OF WORK

- b. The existing flag pole in the front yard, and the existing cast iron boiler in the basement, shall be carefully removed, salvaged, and delivered to the Structures and Grand Division of the Department of Public Works, 800 Pitchers Way, Hyannis, MA. Coordinate delivery time with the Owner's project manager two (2) weeks, prior to scheduled delivery. Clean the cast iron boiler of all demolition debris prior to delivery to the Structures and Grand Division of the Department of Public Works.
- c. Backfill entire site area where building foundation and oil tank have been removed. Finish or rough grade entire site for future tennis courts provided.
- d. Remove and dispose of existing underground tank-storage in its entirety. Note: Tank contains petroleum oil. Refer to Section 02 65 00
- e. Remove and dispose of existing catch basins and asphalt parking Lot A area within the limit of future tennis courts, shown as asphalt Lot A.
- f. Cut and cap sewer line 10'-0" from school building.
- g. Existing septic system, including septic tank, sewer lines and remaining asphalt parking area, catch basin, shed, and guardrails to remain.
- h. Remove and dispose of outdoor recreational equipment, as shown in drawings.
- i. Osterville Bay School Structural Narrative:

The Osterville Bay School is a two-story building originally constructed in the 1920's with an addition added to the rear of the building in the 1950's. Neither the original design drawings nor the design drawings for the addition are available. The general description of the structure is based on observations of the visible condition of the building. Not all structural elements were visible therefore the following narrative should not be considered a complete list of structural elements. The contractor is responsible for verifying all existing conditions prior to beginning work. Both the original building and the addition appear to be of similar construction and consist of (but are not exclusive of) the following general elements:

 - Concrete foundation walls supporting mass brick masonry bearing walls along the full perimeter of the building.

SUMMARY OF WORK

Brick above openings in the exterior walls are supported by steel lintels.

- Interior mass brick masonry bearing walls around stairwells. Brick above openings in the brick walls are supported by steel lintels.
- Concrete slab-on-grade at the basement floor.
- Wood and steel first floor structure consisting of timber joists supported on steel girders and steel pipe columns. Sub-floor consists of diagonal wood tongue-and-groove planks fastened to timber joists.
- Wood framed attic structure consisting of timber joists supported on timber roof trusses and wood stud corridor bearing walls. Portions of the attic framing support tongue-and-groove wood decking.
- Wood framed roof structure consisting of timber rafters supported on timber roof trusses and wood stud stub walls. Roof decking consists of tongue and groove wood planks.

2. **Add Alternate #1: Community Center Gym Demolition**

- a. Completely remove and dispose of the entire Osterville Community Center Gym in its entirety, including all hazardous materials including asbestos and lead paint, and foundations and all utilities. Utilities to be cut and capped in advance of demolition.
- b. Remove and dispose of the entire existing septic system, including all sewer lines, septic tanks and leaching pits, to the extent indicated on the drawings.
- c. Cut and cap, remove and dispose of all underground utilities, to the extent indicated on the drawings.
- d. Remove and dispose of asphalt parking Lot B, catch basins and guardrails.
- e. Remove and dispose of concrete walkway.
- f. Remove and dispose of tree adjacent to Community Building.
- g. Back fill entire site where building foundation and septic tanks had been removed.
- h. Community Building Structural Narrative:
 - The community building is a one-story, slab-on-grade building constructed in the 1980's. The original design drawings for the building are available and are assumed to represent the as-built conditions. Note that the contractor is

responsible for verifying all existing conditions prior to beginning work. The drawings show the following general building structure:

- 3'-0" wide x 12" deep reinforced concrete strip footings along all perimeter walls and below the bearing wall between the gym and the administration area. Footings are shown to be a minimum of 4'-0" below grade, though some areas may be deeper due to the sloping site.
- 12" thick reinforced concrete foundation walls along the full perimeter of the building and below the bearing wall between the gym and the administration area. The top of the concrete wall varies due to the slope at the site. Note that the damproofing on the exterior of the foundation walls has been determined to be asbestos containing material. See the hazardous materials specifications for more information.
- A 4" thick slab-on-grade with welded-wire fabric reinforcing at both the gymnasium and the administration area.
- 10" reinforced concrete thickened slabs below the CMU partition walls in the administration area.
- 12" reinforced CMU bearing walls at all exterior walls and at the wall between the gymnasium and the administration area. Masonry above openings in the masonry bearing walls are supported by steel lintels.
- 30" deep open-web steel roof joists supporting a 1 ½" deep x 22 gauge steel roof deck over the gymnasium.
- 14" deep open-web steel roof joists supporting a 1 ½" deep x 22 gauge steel roof deck over the administration area.
- 16" deep open-web steel roof joists supporting a 1 ½" deep x 22 gauge steel roof deck over the bathroom area.
- 12" deep wide-flange steel beam over the main entrance, supporting a 12" reinforced CMU parapet wall.

1.03 INTENT OF THE PROJECT MANUAL

- A. Whenever "Furnish", "Install", or "Provide" is used in the Contract Documents, it shall mean to erect, install, connect, make operative, and supply all labor and materials, including miscellaneous fittings, hardware, and accessories necessary to complete the installation of the specified item.

SUMMARY OF WORK

- B. The scope of work is indicated in the Project Manual. Areas of required work indicated on the drawings are for illustration and are not to be interpreted as representing quantities, exact locations, and/or the extent of work required. The Owner makes no representation of the exact quantities of work required. It shall be the responsibility of the Contractor to do all work to the complete fulfillment of the requirements of the Project Manual.

1.04 ERRORS, OMISSIONS, AND CONFLICTS IN THE PROJECT MANUAL

- A. In the case of conflicts in the Drawings and the Specifications noticed by the Contractor, the Architect shall be notified immediately in writing of such errors and/or omissions. In no case shall the Contractor proceed without written authorization from the Architect.

1.05 UNFORESEEN FIELD CONDITIONS

- A. In the case of unforeseen field conditions, the Contractor shall notify the Owner and Architect immediately in writing of such conditions. In no case shall the Contractor proceed without written authorization from the Architect. If such unforeseen conditions result in additional expense, the Contractor shall not proceed without the written approval of the Owner.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 20 00

CONDUCT OF THE WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 PROJECT MANAGEMENT

- A. The Contractor's attention is directed to the General Conditions.
- B. The Building will not be occupied during construction. The Contractor will have complete control of the job site and is solely responsible for safety and security on the job site. The Contractor shall take all necessary precautions to ensure the public safety during construction.
- C. The work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient personnel and adequate equipment to complete all the necessary work requirements within a minimum period of time.
- D. Unless specifically authorized by the Awarding Authority, in writing, the work must be conducted between the hours of 8:00 a.m. and 4:00 p.m. on Monday through Friday. No work is to be done on holidays, Saturday's or Sunday's unless approved by the Awarding Authority in advance.
- E. The Contractor is responsible for the security and stability of partially completed

work until the project is accepted by the Awarding Authority.

1.03 SHUTDOWN OF SERVICES

- A. If site utility services to the neighborhood are cut by the contractor, he shall supply all labor, materials or whatever may be required to supply said temporary utility services at no extra cost to the neighborhood and in accordance with the state and local regulations on health and safety, working around the clock, until they are reinstated. The contractor shall also repair the damaged utility immediately at no cost to the Awarding Authority.

1.04 COORDINATION

- A. The Contractor shall submit for approval to the Awarding Authority a detailed operational plan showing the sequence of operations prior to commencement of any work at the site. Any changes to this operational plan must be approved by the Awarding Authority.
- B. The Contractor must retain on the Work during its progress a competent full time representative, satisfactory to the Awarding Authority. This representative shall not be changed, except with the consent of the Awarding Authority. The representative shall be in full charge of the work and all instructions given to this person by the Architect shall be binding.
- C. The Contractor must supply to the Awarding Authority the home telephone number of a responsible person who may be contacted during non-work-hours for emergencies on the Project.

1.05 AWARDING AUTHORITY'S COOPERATION

- A. The Awarding Authority shall assist the Contractor to perform the Work in accordance with the approved operational plan.
- B. The Contractor shall provide:
 - 1. Notification to the Awarding Authority two (2) weeks before any work is scheduled at the site/building.
 - 2. Notification to the Awarding Authority in writing forty-eight (48) hours before work is scheduled in any particular area.
 - 3. An updated schedule monthly with the application for payment. Payments will not be authorized until the updated schedule is received and approved.

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 22 00

UNIT PRICES

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The Unit Prices for items set forth in the Schedule of Unit Prices shall be used to determine adjustments to the Contract Sum when changes in the Work involving said items are made in accordance with Article 8 of the General Conditions and other sections of the Contract Documents.
- B. Unit Prices listed under ADDITIONS have been computed to include net cost plus overhead, profit, and bond and all other charges required to complete the Work item.
- C. Unit Prices net cost includes the cost of all labor, materials, equipment, disposal, and all other costs required to complete the Work item.
- D. Materials, methods of installation, and definitions of terms set forth under the various Unit Price items in the Schedule of Unit Prices shall be as indicated in the Contract Documents.
- E. Unit costs will not be adjusted if the quantities approved in the field by the Architect vary from the base Contract quantities listed in the Project Manual.

1.02 APPLICABILITY OF UNIT PRICES

- A. The payment lines shall be determined in the field by the Architect.
- B. Unit Prices are for more Work or less Work than is included in the base Contract for the various tasks included. Quantities to be included in the base Contract are listed in the Unit Price Schedule.
- C. Prior to commencing removal or placement of materials set forth in the Schedule of Unit Prices, the Contractor shall notify the Architect in sufficient time to permit proper measurements to be taken on behalf of the Owner. Only quantities which have been approved in writing by the Architect will be considered in the determination of adjustments to the Contract Sum. Unit costs shall include the pro-rata share of all costs associated with doing the Work, including staging, insurance, overhead, and profit, as well.
- D. Performance of Work which is not required under the Contract Documents or which is not authorized by Change Order, whether or not such Work item is set forth hereunder as a Unit Price item, shall not be considered cause for extra payment. The Contractor will be held fully responsible for such unauthorized Work, including the performance of all corrective measures required by the Architect.
- E. See attached Unit Price Schedule.

UNIT PRICE SCHEDULE

#	DESCRIPTION OF WORK	UNITS	BASE BID QUANTITY	REFERENCE DETAILS	ADD / DEDUCT PRICE (Insert only one number)
1	Additional excavation required to manage and dispose of petroleum contaminated soil.	CF	0	Technical Section 23 00 00	

- F. All repair locations will be determined and marked in the field by the Engineer. Repairs will be located at small individual locations throughout the entire scope area. Unit Price Work performed without the approval of the Engineer will not be paid for.
- G. The Owner reserves that right to increase or decrease the unit cost quantities without any adjustment in the unit costs.
- H. Unit costs include pro-rata share of Contractor's, general conditions, staging, insurance, bond, overhead, and profit, etc.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 ALTERNATE SCOPE

- A. This Section lists the Alternates which appear in the Contract Documents. Consult the individual sections of the detailed requirements of each Alternate.
- B. Bid prices for each Alternate shall include overhead, profit, and all other expenses incidental to the Work under each Alternate.
- C. The Contractor and Subcontractors shall be responsible for examining the scope of each Alternate generally defined herein and for recognizing modifications to the Work caused by the Alternates and including the cost thereof in the bid price.

1. **Add Alternate #1: Community Center Gym Demolition**

- a. Completely remove and dispose of the entire Osterville Community Center Gym in its entirety, including all hazardous materials including asbestos and lead paint and foundations and all utilities. Utilities to be cut and capped in advance of demolition.

- b. Remove and dispose of the entire existing septic system, including all sewer lines, septic tanks and leaching pits, to the extent indicated on the drawings.
- c. Cut and cap, remove and dispose of all underground utilities, to the extent indicated on the drawings.
- d. Remove and dispose of asphalt parking Lot B, catch basins and guardrails.
- e. Remove and dispose of concrete walkway.
- f. Remove and dispose of tree adjacent to Community Building.
- g. Back fill entire site where building foundation and septic tanks had been removed.
- h. Community Building Structural Narrative:
 - The community building is a one-story, slab-on-grade building constructed in the 1980's. The original design drawings for the building are available and are assumed to represent the as-built conditions. Note that the contractor is responsible for verifying all existing conditions prior to beginning work. The drawings show the following general building structure:
 - 3'-0" wide x 12" deep reinforced concrete strip footings along all perimeter walls and below the bearing wall between the gym and the administration area. Footings are shown to be a minimum of 4'-0" below grade, though some areas may be deeper due to the sloping site.
 - 12" thick reinforced concrete foundation walls along the full perimeter of the building and below the bearing wall between the gym and the administration area. The top of the concrete wall varies due to the slope at the site. Note that the damproofing on the exterior of the foundation walls has been determined to be asbestos containing material. See the hazardous materials specifications for more information.
 - A 4" thick slab-on-grade with welded-wire fabric reinforcing at both the gymnasium and the administration area.

- 10” reinforced concrete thickened slabs below the CMU partition walls in the administration area.
- 12” reinforced CMU bearing walls at all exterior walls and at the wall between the gymnasium and the administration area. Masonry above openings in the masonry bearing walls are supported by steel lintels.
- 30” deep open-web steel roof joists supporting a 1 ½” deep x 22 gauge steel roof deck over the gymnasium.
- 14” deep open-web steel roof joists supporting a 1 ½” deep x 22 gauge steel roof deck over the administration area.
- 16” deep open-web steel roof joists supporting a 1 ½” deep x 22 gauge steel roof deck over the bathroom area.
- 12” deep wide-flange steel beam over the main entrance, supporting a 12” reinforced CMU parapet wall.

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 24 00

SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 BIDDERS EXAMINATION AND INSPECTION OF EXISTING BUILDING AND SITE

- A. All bidders must inspect the existing site and make their own assessment of the work required to achieve the complete, finished conditions specified in the Contract Documents.
- B. Failure to adequately inspect the site and/or correctly assess existing conditions shall not be cause for additional payment.
- C. Every contractor will be bound by the scope of work of the Contract Documents and shall make the inspections necessary to assure that the bid price includes the complete scope.

1.03 HOURS OF WORK

- A. Work may not commence until after September 5, 2017, with written authorization from the Town. Hours of operation work may commence at 8:00 A.M. and continue until 4:00 P.M., Monday through Friday. Interior Hazardous Materials Abatement and Interior Work, in that order, may commence after July 5, 2017.
- B. The contractor shall be completely and fully responsible for the security and safety of the job site at all times.

1.04 CONTRACTOR USE OF THE BUILDINGS, ACCESSIBILITY AND SCHEDULES FOR WORK

- A. The work of the Contractor and all Subcontractors shall be performed during the hours of operation as specified herein and in and around areas of the building and site used while occupied by the Owner and the public. The building will remain occupied during the entire duration of the project. The Contractor shall execute the Work with the least possible disturbance to the use and continuous functioning of the site and building. The Contractor and each Subcontractor take all necessary measures to assure the safety of the staff, visitors, and the general public. The General Contractor is solely responsible for safety on the job site including securing and making safe all construction areas during construction hours as well as during non-construction hours.
- B. Schedule of Work and Site Use
 - 1. The Contractor shall schedule the work of this Contract so as to perform and complete the Work of the Contract according to the following schedule. The Contractor shall within seven (7) days of the Notice of Contract Award, submit a schedule to the Owner and Architect for review.
 - 2. It is expected that the Contractor utilize the time period between the Notice of Award and construction start date to schedule and coordinate the work and work sequence with their own forces and their subcontractors, prepare shop drawings and submittals for approval and order materials. The Owner shall issue a Notice to Proceed.
 - 3. The Contractor shall be responsible for providing any and all measures and/or temporary construction required to control the transmission of dust, particles, and fumes from construction activities.

4. The Contractor shall be responsible on a daily basis for informing the designated Owner's representative of all persons on-site that day associated with the Work. The Contractor shall establish a daily reporting system of all activities which is acceptable to the Owner.
5. The Construction schedule shall indicate the dates for start and completion of each work item or task required with all milestones using a Bar Chart subject to approval by the Architect.
6. The Awarding Authority's review of the project construction schedule shall not extend to the accuracy or other matters dealt with in the schedule, including but not limited to whether work is omitted, whether duration of activity is reasonable, the level of labor, materials or equipment, the Contractor's means, methods, techniques, procedures or sequence of construction, or whether the sequence and timing for work remaining are practical. The accuracy, correctness of all work, sequencing, and schedules shall remain the sole responsibility of the Contractor. Neither the Awarding Authority's review of a schedule nor a statement of resubmittal not required shall relieve the Contractor for the responsibility for complying with the contract schedule, adhering to sequences of work, or from completing any omitted work with the Contract Time.
7. The Contractor shall provide, erect and maintain barricades with any required egress, access doors, lighting, ventilation, guard rails and all other appurtenances required to protect the general public, visitors, staff, and workers while construction is in progress. Safety is the sole responsibility of the Contractor on the job site.

1.05 HOUSEKEEPING AND PROTECTION OF EXISTING CONDITIONS

- A. Maintain the premises in a safe, orderly condition at all times. Protect construction, furnishings, equipment and other items.
- B. Property Protection: The General Contractor shall take all measures necessary to protect the Owner's property.
- C. Security: The General Contractor shall take every possible precaution to maintain the security of the buildings and site. The Contractor shall cooperate with the Owner fully and follow the Owner's directions as issued. The Contractor shall control and restrict access to areas of work to prevent injury to persons and property.

SPECIAL PROJECT PROCEDURES

- D. The Contractor shall properly cover, protect and maintain floor and finished surfaces to prevent damage. Replace protective coverings which become wet, torn or ineffective.
- E. Finished Surfaces Protection:
 - 1. The Contractor shall restrict traffic on finished surfaces to that required to perform the work of this Contract and permit traffic only required to properly complete the Work.
 - 2. Effectively protect surfaces to prevent damages to existing substrates, new finishes, and to finished roofing work. Provide temporary walkways and work platforms as needed.
 - 3. Load distribution: The Contractor and any Subcontractor shall not load or permit any part of the structure to be loaded in any manner that will damage the existing structure or endanger the safety of persons or property. Such loads shall include live and dead loads and all moving, vibratory, temporary, and impact loads.
- F. Correction by the Contractor
 - 1. At no additional cost to the Owner, the General Contractor shall immediately correct all deficiencies, including damages to the building, site and site surfaces, damages to furnishings, damages to equipment or systems, damage to adjacent properties, and all other damage caused by the General Contractor or its Subcontractors during the execution of the Work of this Contract. Any and all damages resulting from inadequate, insufficient or defective temporary protections installed by the Contractor during the work of this Contract, shall be corrected by the General Contractor at no additional cost to the Owner.

1.07 DUST, DIRT, AND FUME CONTROL

- A. The Contractor shall take all necessary precautions and provide all necessary temporary construction to effectively contain dust, dirt and fumes within the areas of work and within the work limits. Temporary construction shall be provided to effectively prevent dust and dirt from entering areas of the buildings or adjacent buildings, satisfying all Municipal, State and Federal laws, codes, and requirements.

1.08 RUBBISH REMOVAL

- A. The Contractor shall remove all rubbish, waste, tools, equipment and appurtenances caused by and used in the execution of the Work; but this shall in no way be construed to relieve the Contractor of his primary responsibility for maintaining the building and Project site clean and free of debris, leaving all work in a clean condition and satisfactory to the Official.
- B. Immediately after unpacking, the Contractor shall collect and remove from the building and Project site all packing materials, case lumber, excelsior, wrapping and other rubbish.
- C. Rubbish removal shall occur so that trash and debris are contained in closed and secured waste containers.

1.09 CLEANING

- A. The Contractor shall at all times keep the building and Project site free from accumulation of waste materials or rubbish.
- B. Immediately prior to final inspection, the entire building and surrounding Project areas shall be thoroughly cleaned by the Contractor including, without limitation:
 - 1. All construction facilities, tools, equipment, surplus materials, debris and rubbish shall be removed from the Project site and the entire Work shall be left broom clean.
 - 2. All finished surfaces shall be left in perfect condition, free of stains, spots, marks, dirt, and other defects. The Contractor shall be responsible for the cleaning of the Work of all trades, whether or not cleaning by such trades is included in their respective Selection of the Specifications.
 - 3. Plenums, duct spaces and furred spaces shall be protected at all times from fumes, particles and other air-borne construction effects. These building spaces shall be left clean of debris and decayable materials.
 - 4. Equipment and building systems located in areas of construction shall be cleaned and tested and made perfectly operational to the satisfaction of the Owner prior to Substantial Completion or partial Substantial Completion of that area of work.

- C. In cleaning items having manufacturer's finish, or items previously finished by a Subcontractor, care shall be taken not to damage such finish. In cleaning glass and finish surfaces, care shall be taken not to use cleaning agents which may stain or damage any finish materials. Any damage to finishes caused by cleaning operations shall be corrected and repaired by the Contractor at no increase in Contract Price.

1.10 OR-EQUAL

- A. Where materials, equipment, apparatus, or other products are specified by Manufacturer, brand name, type or catalog number, such designation is to establish standards or performance, quality, type and style.
- B. If the General or Subcontractor wishes to use materials or equipment other than these specifically designated herein, as being equal to those so specifically designated, he shall submit the proposed substitution before purchasing and/or fabrication in accordance with the requirement of the General Conditions for approval.
- C. It is the responsibility of the Contractor to submit all back-up material and data needed to prove that the proposed product is an "or-equal". The Architect will not review an alternative product without proper documentation. Alternative products and assemblies will be rejected immediately without proper documentation.
- D. The schedule of the project is not subject to the availability of products submitted as "or approved equal" or the review needed to certify an "or approved equal" product.

1.11 PERMITS AND POLICE DETAILS

- A. The contractor is responsible for procuring and paying for all applicable permits and police details throughout the entire project.
- B. The Contractor is responsible for all Town permit fees. Please note that the Town will NOT waive permit fees for this project.

1.12 COORDINATION

- A. The Contractor shall coordinate locations of all items to be installed with the Architect. If an item is not dimensioned, for height or location, contact the Architect for the installation information. Installation of items without the proper dimensional information may result in reinstallation at no additional charge by the contractor.

1.13 GENERAL NOTES

- A. CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING AND COORDINATING ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. IN CASE OF CONFLICT, THE ARCHITECT SHALL BE NOTIFIED AND SHALL RESOLVE THE CONFLICT.
- B. IN ANY CASE OF CONFLICT BETWEEN OR WITHIN THE DRAWINGS AND THE PROJECT SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
- C. THE CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT PRIOR REVIEW BY THE ARCHITECT.
- D. WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES SHALL BE REPEATED.
- E. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND LOCAL LAWS AND REGULATIONS.
- F. GENERAL CONTRACTOR SHALL COORDINATE LOCATIONS OF OPENINGS, PITS, BOXES, SUMPS, TRENCHES, SLEEVES, DEPRESSIONS, GROOVES, AND CHAMFERS, WITH MECHANICAL, ELECTRICAL AND PLUMBING TRADES.
- G. THE STRUCTURAL DESIGN OF THE BUILDING IS BASED ON THE FULL INTERACTION OF ALL ITS COMPONENT PARTS. NO PROVISIONS HAVE BEEN MADE FOR CONDITIONS OCCURRING DURING CONSTRUCTION. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO MAKE PROPER AND ADEQUATE PROVISIONS FOR STABILITY OF, AND ALL STRESSES TO THE STRUCTURE DUE TO ANY CAUSE DURING CONSTRUCTION.
- H. CONTRACTOR SHALL NOT SCALE DRAWINGS. CONTRACTOR SHALL REQUEST ALL DIMENSIONS OR INFORMATION REQUIRED TO PERFORM THE WORK FROM THE ARCHITECT. WORK COMPLETED BY THE CONTRACTOR WITHOUT DIMENSIONS OR INFORMATION SHALL BE DONE AT THEIR OWN RISK AND, IF DEEMED INCORRECT BY THE ARCHITECT, SHALL BE REMOVED AND REINSTALLED TO THE SPECIFICATIONS OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.

DEMOLITION OF FORMER OSTERVILLE
BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER GYM
HYANNIS, MASSACHUSETTS
CBI JOB NO.: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

- I. CODES: THE PROJECT IS BASED ON THE REQUIREMENTS OF THE MASSACHUSETTS STATE BUILDING CODE - EIGHTH EDITION.
- J. THE PLANS WERE COMPILED FROM VARIOUS SOURCES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS AND DIMENSIONS.

1.19 INSURANCE

- A. Barnstable Public Schools, The Town of Barnstable, and CBI Consulting Inc. shall be listed as Additional Insured with a Waiver of Subrogation on the insurance policies (overall liability, umbrella, and automobile) for this project.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 25 00

COORDINATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 COORDINATION WITH THE BARNSTABLE HIGH SCHOOL BUILDING AND SCHOOL BUILDING PROCEDURES

- A. The safety and welfare of the employees and guests are the utmost concern of the project. All work by the Contractor, his Sub-Contractors, Sub-Bidders, suppliers, and employees shall be performed in a way that will safeguard this concern. Safety is the sole responsibility of the Contractor on the jobsite. Extraordinary care must be taken throughout the project to coordinate work activities with the School Department schedules, procedures, and activities.
- B. All construction activities, including, but not exclusive of scheduling and deliveries to the school are to be coordinated with the Owner's Project Manager.
- C. Pre-construction meetings shall be held with the Owner's Project Manager, the Contractor and Architect, to coordinate locations for dumpsters and chutes, deliveries, worker parking, material storage, as well as to discuss safety, and scheduling, procedures.

- D. Contractor shall restrict hazardous items and activities to locations that will have the least impact on the daily operations of the school activities. All material storage, locations of cranes, dumpsters, workers access, etc. will be only in areas approved by the Barnstable Public Schools.
- E. Install, at a minimum, when work is performed overhead, covered walkway protection at all entrance and exit doors, at areas of construction, to the facility during construction activities, (10'-0") minimum length, of pipe scaffolding, plywood, planking, orange plastic fencing, and yellow safety tape. Safety is the sole responsibility of the contractor, regardless of the information in this specification.
- F. Contractor shall cover all interior spaces where work will occur, with minimum 6-mil poly tarps before operations commence above to protect interior surfaces and equipment from debris and dust. All protections shall be removed immediately upon completion of the work. Dust and debris not contained by the tarps shall be immediately vacuumed to the satisfaction of the Owner's Project Manager. Damage as a result of the work will be repaired to the satisfaction of and at no additional cost to the owner.
- G. Contractor shall provide signage and other safety barriers at the site adequate to support their safety program and to properly identify building entrances and exits.
- H. Contractor shall update the Construction schedule monthly. Requisitions for payment must be accompanied by an updated schedule. The on-site superintendent shall meet with the Owner's Project Manager daily at to inform them of the daily progress and review the schedule for the next three (3) days.

1.03 SCHEDULING

- A. Time is of the essence in this project.
- B. Temperature is a critical factor in the construction work. Adhere to manufacturer's specifications.
- C. Within five (5) days after the Contractor has received the Owner's Notice to Proceed, and before the commencement of any work, the Contractor shall transmit the proposed construction schedule to the Owner and Architect for review. If any change in the work will alter agreed upon schedules, the Contractor shall immediately notify the Owner and Architect in writing.
- D. The Contractor shall confine his/her apparatus, storage of materials, and operation of his/her workmen to limits as required by the Owner, and shall not unreasonably encumber the premises with these materials. He/she shall keep all access roads and walks clear of construction equipment, materials, and debris of any kind.

He/she shall repair any and all damage to access roads, walks, the building facade and roof caused by construction operations, and leave them in at least as good condition as originally found. All operations shall be confined within the property. All delivery and construction operations shall be conducted so as to avoid all possible obstruction of the work and building operations. The Contractor shall meet regularly with the Owner to coordinate the use of the Site.

- E. The Contractor must request approval from the Barnstable Public Schools to work after hours, or on Saturdays or Sundays with paid Barnstable Public Schools staff, at no additional expense to the Owner.

1.04 SUBCONTRACTORS

- A. Subcontractors are subject to approval by the Owner.

1.05 CONSTRUCTION REVIEW

- A. All materials and workmanship shall be subject to review by the Architect and all designated representatives of the Owner. Such review may take place at any time during the construction, and wherever work relating to this project is underway. The Contractor shall notify the Architect of any approaching stage of the work likely to require his/her attention, and the Architect shall have the right to reject all defective or non-conforming workmanship and material, and to require its replacement.
- B. If any un-reviewed work is covered up without approval, the Contractor shall bear the costs of uncovering it upon request.

1.06 CODES

- A. Codes, standards, and publications of private and public bodies mentioned in these specifications, and other such standards and specifications, refer to the latest edition thereof at the time of taking bids unless a specific edition is designated, and shall be considered and integral part of the Contract Documents.

1.07 COORDINATION OF WORK

- A. Contractor shall coordinate all construction work with David Kanyock, Director of Facilities for the Barnstable Public Schools.
- B. Contractor is responsible for all building and sidewalk permits, police details as required as well as any other requirements that may be imposed by the Town of Barnstable.

- C. The Contractor shall be responsible for maintaining required building egress at all existing building egress locations simultaneously during the work.

1.08 SPECIFICATION DISTRIBUTION TO WORKMEN

- A. A complete copy of the Project Manual, including Plans and Specifications shall be kept at the construction site at all times.
- B. At the direction of the Architect, the Contractor shall photocopy various parts of pertinent Sections of the Project Manual to be handed out to each tradesman.

1.09 DELIVERY AND STORAGE

- A. Materials shall be delivered dry, in their original, unopened containers, clearly labeled with manufacturer's name, brand name, and such identifying numbers as are appropriate. Materials shall be stored as required by the Manufacturer's specifications.
 - 1. All materials shall be stored flat, or in the case of rolls, standing on end, elevated from the ground or deck, and protected with approved waterproof covers to keep the materials dry and protected from sunlight and moisture, and ventilated to prevent excessive temperature.
 - 2. Flammable materials shall be stored in a cool, dry area away from sparks and open flames.
 - 3. Damaged or deteriorated materials shall not be used and shall be removed from the job site.
 - 4. All cardboard containers shall be stored in dry areas or on pallets. Packing materials shall be collected so as not to blow around the site.
 - 5. All materials shall be stored in temperatures specified by the manufacturer. Submit proposed storage arrangements regarding temperature to the Architect and the materials manufacturer for review.
 - 6. All fire stopping shall be performed by each respective trade.

1.10 JOB CONDITIONS

- A. Do not deliver to site or install any material or system that has not been approved. Materials installed without approval may be required to be removed and replaced at no additional cost to the Owner.

- B. Materials which have a temperature other than the application temperature of the manufacturer shall not be applied.
- C. All materials shall be installed according to manufacturer's specifications and shall be compatible with the existing materials used on site.

1.11 FIELD MEASUREMENTS

- A. Before ordering any materials or performing any work, the Contractor or his/her subcontractors shall inspect all existing conditions and perform all measurements at the building. No extra charge or compensation will be allowed because of differences between the drawings and the actual dimensions. Any differences between the Project Manual and the actual conditions found shall be submitted to the Architect for his/her decision before proceeding with the work.

1.12 CONDITIONS, DIMENSIONS AND QUANTITIES

- A. All conditions, dimensions and quantities shall be determined or verified by the Contractor. The Plans and details have been compiled from various sources and may not reflect the actual condition at the moment of construction. The Contractor is cautioned to take all precautions and make all investigations necessary to install the proposed work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

1.13 CUTTING AND PATCHING

- A. The work to be performed under this Contract shall include all cutting and patching necessary to accommodate new work.

1.14 PERMITS

- A. All fees and procurement of building permits shall be the responsibility of the Contractor. Requests for inspections by the Building Inspector and the obtaining of required signatures by Inspection on permits, is the responsibility of the Contractor. Permit fees will not be waived.

1.15 DUMPING

- A. The contractor shall submit an affidavit certifying legal and proper dumping and disposal (including locations) of all materials from the project.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

COORDINATION

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DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 30 00

SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1- GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be provided complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually provided in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated into the work shall be new and of the best grade of their respective kinds.
- E. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

1.02 GENERAL PROCEDURES FOR SUBMITTALS

- A. Timeliness - The Contractor shall transmit each submittal to the Designer sufficiently in advance of performing related Work or other applicable activities so that the installation is not delayed by processing times, including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect in advance of the Work.
- B. Sequence - The Contractor shall transmit each submittal in a sequence which will not result in the Architect's approval having to be later modified or rescinded by

reason of subsequent submittals which should have been processed earlier or concurrently for coordination.

- C. The Contractor's Review - Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review by the Architect. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To", "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section, or Drawing No. to which the submittal refers, purpose (first submittal, resubmittal), description, remarks, distribution record, and signature of transmitter.
- D. Architect's Action - The Architect will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:
1. Final Unrestricted Release: Where marked "Approved" the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.
 2. Final-But-Restricted Release: When marked "Approved as Noted" the Work may proceed provided it complies with the Architect's notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend on these compliances.
 3. Returned for Resubmittal: When marked "Revise and Resubmit" or "Disapproved" the Work covered by the submittal (such as purchasing, fabrication, delivery, or other activity) should not proceed. The submittal should be revised or a new submittal resubmitted without delay (no limit to number of resubmissions), in accordance with the Designer's notations stating the reasons for returning the submittal.
- E. Processing - All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

1.03 OR EQUALS

- A. Definition - Whenever a specification section names one or more brands for a given item, and the Contractor wishes to submit, for consideration, another brand, the submission shall be considered an "or-equal" or a "material substitution". For the purposes of this Contract, the terms "or-equal" and "material substitution" shall be considered synonymous.

- B. In no case may an item be provided on the Work other than the item named or described, unless the Architect, with the Owner's written concurrence, shall consider the item equal to the item so named or described, as provided by M.G.L. c.149.
- C. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Architect, including all research and full documentation, at the expense of the Contractor submitting the substitution.
- D. The Designer and/or the Owner may require that full size samples of both the specified and proposed products be submitted for review and evaluation. The Contractor shall bear full cost for providing, delivering, and disposal of all such samples.
- E. The Contractor shall assume full responsibility for the performance of any item submitted as an "Or-Equal" and assume the costs of any changes in any Work which may be caused by such substitution.
- F. Or Equal Approval Process - On the transmittal or on a separate sheet attached to the submission, the Contractor shall direct attention to any deviations, including minor limitations and variations, from the Contract Documents.
 - 1. The Contractor shall submit to the Architect for consideration of any or-equal substitution a written point-by-point comparison containing the name and full particulars of the proposed product and the product named or described in the Contract Documents.
 - 2. Such submittal shall in no event be made later than ten (10) calendar days prior to the incorporation of the item into the Work. In any case in which the time period specified in the Contract Documents from the Notice to Proceed to Substantial Completion is less than 30 days, this requirement can be waived by the Architect.
 - 3. Upon receipt of a written request for approval of an or-equal substitution, the Architect shall investigate whether the proposed item shall be considered equal to the item named or described in the Contract Documents. Upon conclusion of the investigation, the Architect shall promptly advise the Contractor that the item is, or is not, considered acceptable as on Or-Equal substitution. Such written notice must have the concurrence of the Owner.

1.04 SUBMISSION OF SHOP DRAWINGS

- A. Shop Drawings shall be complete, giving all information necessary or requested in the individual section of the specifications. They shall also show all adjoining

Work, other work affected, and details of connection thereto, including hardware, flashing, waterproofing, and all utilities.

- B. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.
- C. The Architect reserves the right to review and approve shop drawings only after approval of related product data and samples.
- D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Architect's stamp.
- E. The Contractor shall submit to the Architect seven (7) black line prints of each shop drawing. Transparency and prints shall be mailed or delivered in roll form. Each submittal shall be accompanied by a transmittal notice.
- F. When the transparency is returned by the Architect with the stamp "Revise and Resubmit" or "Disapproved", the Contractor shall correct the original drawing or prepare a new drawing and resubmit seven (7) prints thereof to the Architect for approval. This procedure shall be repeated until the Architect's approval is obtained. No limit.
- G. The Contractor shall maintain one full set of approved shop drawings at the site.
- H. Photo copies of the bid documents are not acceptable as shop drawings.
- I. Provide shop drawings for every item to be installed or repaired in the entire project, whether or not indicated in the spec section.

1.05 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES (SUBMITTALS AND DISTRIBUTION)

- A. The General Contractor, within ten (10) working days after the commencement of work shall prepare and submit for the Architect's approval a schedule of Shop Drawings, Product Data and Samples required to be submitted for the work. The schedule shall indicate by trade the date by which final approval of each item must be obtained, and shall be revised as required by conditions of the work, subject to Architect's approval. The schedule of Shop Drawings shall correspond to the Construction Schedule so that the submissions relate to the time when the products and/or systems will be required on the site. The Architect will not approve a Schedule which calls for out of sequence submittals.

- B. General Contractor shall submit Shop Drawing, product data and samples accompanied by the General Contractor's Shop Drawing, Product Data and Sample Transmittals form.
- C. Preparation of Submittal Form: Fill out transmittal form in the following manner using a typewriter or word processor, and retain one copy – General Contractor's first file:
- | | | |
|-----|---------------------------|---|
| 1. | General Contr.
Job No. | General Contractor's name and job number. |
| 2. | Spec. Section | The Specification Section number where item is specified – do not submit items from more than one Specification Section on the same form. |
| 3. | Submitted by | Name of General Contractor's employee responsible for the General Contractor's review. |
| 4. | Project/No. | Project name and Architect's project number. |
| 5. | Transmittal No. | Transmittal numbers shall be consecutive for the project. |
| 6. | Date Submitted | Date leaving General Contractor's office. |
| 7. | Subcontractor | Name of firm preparing original documents (shop drawings or sample). |
| 8. | Submission No. | 1 st , 2 nd , 3 rd , etc. depending on previous submission for same item (see Resubmittal procedure). |
| 9. | Spec. Sec. Para. | Specific paragraph number which item as Specified. |
| 10. | Copies & Type | Number of copies submitted and type of material submitted (sepia, print, brochure or sample, etc.). |
| 11. | Contr.'s Remarks | Note exceptions or deviations from the Contract Documents and reasons for them. |
- D. Resubmissions: Resubmittal shall follow the same procedures as the initial submittal with the following exceptions:

1. Transmittal shall contain the same information as the first transmittal except that transmittal numbers shall run consecutively and the submission number shall indicate 2nd, 3rd, etc. submission. The drawing number/description shall be identical to the initial submission and the date shall be the revised date for that submission.
2. Unless otherwise approved by the A, no new material shall be included on the same transmittal for a resubmission.
3. Where Resubmittal has not been required by the Architect, but corrections have been noted on a shop drawing, seven (7) prints of the drawings after the noted corrections have been made shall be submitted to the Architect for record purposes but not for action. Shop Drawings reviewed by the Designer's Architects will have three prints returned.

E. Submittal Procedures by General Contractor for Approval

1. General: All submittals shall be made to Architect's office.
2. Shop Drawings: Seven (7) black line prints (maximum sheet size shall be 30 x 42).

F. Architect's Review Procedures:

1. The Architect's review, including Architect's review period will not exceed fourteen (14) calendar days from the established date of each submission indicated on the Schedule of Shop Drawings, Product Data, and Samples plus the additional time, if any, for distribution by the General Contractor and receipt of submissions by the Architect. The General Contractor is required to strictly adhere to the established Schedule dates.
2. The Architect will process the submission and indicate the appropriate action on the submission and the transmittal. Incomplete or erroneous transmittals will be returned without action.
3. The Architect will fill out transmittal in the following sequence:
 - a. Date Received Date arriving in the Architect's office.
 - b. Date Return Date leaving the Architect's office to the General Contractor.
 - c. To/Date Name of architect to whom submission is sent for review and date leaving the Architect's office.

- | | | |
|----|---------------------|--|
| d. | From/Date | Name of architect reviewing submission and date arriving in the Architect's office. |
| e. | Action | Indicate action taken on submission. |
| f. | Distribution | Number of copies distributed and type of material distributed (sepia, print, brochure or samples, etc.). |
| g. | Architect's Remarks | Note major deviations from the Contract Documents. |
4. The Architect will return two (2) of Shop Drawings, one Sample or two brochures with copies of transmittal forms to the General Contractor.
5. The Architect will keep a copy and send one copy to the Owner.

1.06 SUBMISSION OF PRODUCT DATA

- A. The Contractor shall submit seven (7) copies of Product Data to the Architect. All such data shall be specific and identification of material or equipment submitted shall be clearly marked in ink. Data of general nature will not be accepted.
- B. Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not impair legibility.
- C. Product Data returned by the Designer as "Disapproved" shall be resubmitted in seven (7) days until the Architect's approval is obtained.
- D. When the Product Data are acceptable, the Architect will stamp them "Approved" or "Approved as Corrected", distribute to the team 3 copies, and return two (2) copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.
- E. The Contractor shall maintain one full set of approved, original, Product Data at the site.
- F. Provide product data for all items to be installed whether or not noted in the specification section.

1.07 SUBMISSION OF SAMPLES

- A. Unless otherwise specified in the individual section, the Contractor shall submit three specimens of each sample.
- B. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.
- C. Samples of items of interior finishes shall be submitted all at once to permit a coordinated selection of colors and finishes.
- D. Samples which can be conveniently mailed shall be sent directly to the Designer, accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.
- E. All other samples shall be delivered at the field office of the Project Representative with sample identification tag attached and properly filled in. Transmittal notice of samples so delivered with the Contractor's stamp of approval shall be mailed to the Architect.
- F. If a sample is rejected by the Architect, a new sample shall be resubmitted in the manner specified hereinabove. This procedure shall be repeated until the sample is approved by the Architect.
- G. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention is made in the specifications, at no additional cost to DCAM.
- H. Samples shall not be installed as part of the work.
- I. Provide color and finish samples of every item to be installed.

1.08 CONSTRUCTION SCHEDULE

- A. The Proposed Construction Schedule shall be based on an orderly progression of the work, allowing adequate time for each operation, and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The Proposed Construction Schedule will be reviewed by the Owner/Architect for compliance with the requirements of this Article and will be accepted or returned to the Contractor for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the Proposed Construction Schedule has been approved by the Owner/Architect.

- B. The Proposed Construction Schedule in **critical path method form** which shall include the following with such other details as Owner/Architect may require:
1. Indicate complete sequence of construction by activity, with dates for beginning and completion of each element and stage of construction.
 2. Identify each item by major Specification Section number.
 3. Submittal and Approval Dates for all Shop Drawings and Samples.
 4. A chart showing Critical Delivery Dates for Material and Equipment to be incorporated into the Work.
 5. Provide sub-schedules to define critical portions of entire Schedule.
 6. Coordinate content with Schedule of Values and provide the cost of each activity as identified in the Construction Schedule.
- B. During the progress of the Work, any changes in the original schedule desired by the General Contractor which affect Contract completion dates shall be approved by the Owner before being put into effect.
- C. When changes in the Work are required, the original Proposed Construction Schedule shall be revised without delay to incorporate such changes or new work and indicate the effect hereof on the Project as a whole.
- D. Provide updated critical path method (CPM) chart each month. Submit chart for review with Contractor's Application for Payment.

1.09 SCHEDULE OF VALUES

- A. Prior to the first request for payment, the General Contractor shall submit to the Architect and Owner, a Schedule of Values of the various portions of the work in sufficient detail to reflect various major components of each trade, including quantities when requested, aggregating the total contract sum, and divided so as to facilitate payments for work under each Section in accordance with Article VII of the Contract Form. The Schedule shall be prepared in such form as specified or as the Architect or Owner may approve, and it shall include data to substantial its accuracy. Each item in the Schedule of Values shall include its proper share of overhead and profit in this schedule, including breakdown of values, requires the approval of the Architect and Owner and shall be used only as a basis for the Contractor's request for payment.

1.10 MANUFACTURER'S INSTRUCTIONS

- A. Submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for all products.

1.11 CERTIFICATES OF COMPLIANCE

- A. Submit certificates of compliance together with the associated Shop Drawings, Product Data and Samples required for the Product.
- B. Submit on 8-1/2 in. x 11 in. white paper.
- C. Submit one (1) copy.
- D. The Architect will retain the certificates of compliance; no approval reply is intended.

1.12 PATTERNS AND COLORS

- A. Submit accurate color charts and pattern charts to the Architect for his/her review and selection whenever a choice of color or pattern is available in a specified product, unless the exact color and pattern of a product are indicated in the Contract Documents. Submit actual cured samples of all materials for color approval.

1.13 RECORD DRAWINGS

- A. At the completion of the project, the Contractor shall prepare a complete set of reproducible record drawings and AutoCAD Files, latest version on compact discs showing all systems as actually installed, and PDF files submitted on a CD.

1.14 SUBMITTAL TRANSMITTAL FORM

- A. All submittals shall be presented with the submittal transmittal form attached, completely filled out. Submittals without the attached form will be returned without review.

END OF SECTION

SUBMITTAL TRANSMITTAL

From:

(Contractor's Company Information)

To: CBI Consulting Inc.
250 Dorchester Ave.
Boston, MA 02127

Project: _____

Contractor's Project #: _____

Architect's Project #: _____

C.C.: _____

Date: _____

Submittal Number: _____

We are sending for your Approval Review the following items:

Specification Number: 00 00 00.00

Specification Title: _____

Subcontractor/Supplier: _____

	Copies:	Date:	Description	Size:
Product Data Sheet				
MSDS Sheets				
Shop Drawings				
Warranties				
Qualifications				
Samples				

Deviations from Contract Documents: _____

Designer's Stamp

Contractor's Stamp

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 40 00

QUALITY CONTROL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 INSPECTION AND TESTING

- A. An independent inspector and/or testing laboratory may be engaged and paid for by the Owner to perform the inspection and testing of the new work.
- B. The Contractor shall cooperate with the inspector and/or testing laboratory, furnish materials and labor as may be required and provide for convenient access to all parts of the work for purposes of inspection and testing.
- C. The Contractor shall accept as final the results of all such inspection and testing.
- D. The inspector shall have the authority to delay the commencement of work, or to stop the work at any time, for any reason which he deems necessary.
- E. The inspector and/or testing laboratory reserves the right to require the Contractor to perform removal of materials installed by the Contractor. Make all cuts in accordance with the recognized standard practices. Remove materials only in the presence of the inspector.

1. Immediately after removing each material sample identify each by number and exact location by gummed label attached to a smooth surface of the cut sample.
 2. Submit the cut samples directly to the inspector after applying identification.
 3. Replace the cut with new materials, matching those removed, immediately after each removal, and insure that the replacement is completely watertight.
- F. The removal cuts shall be subjected to various tests, including moisture content, density, thickness, compressive strength, composition, conformance with ASTM specifications where applicable, conformance with the recommendations of the manufacturers whose materials were used.
- G. Bear all costs for tests where materials or systems have been found unacceptable and all costs for replacement required due to such unacceptability.
- H. If any replacement work is required, such work will also be subject to the terms of this SPECIFICATION.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 42 16

DEFINITIONS & STANDARDS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 DELIVERY AND STORAGE

- A. Materials shall be delivered dry, in their original, unopened containers, clearly labeled with manufacturer's name, brand name, and such identifying numbers as are appropriate. Materials shall be stored as required by the Manufacturer's specifications.
 - 1. All materials shall be stored flat, or in the case of rolls, standing on end, elevated from the ground or deck, and protected with approved waterproof covers to keep the materials dry and protected from sunlight and moisture, and ventilated to prevent excessive temperature.
 - 2. Flammable materials shall be stored in a cool, dry area away from sparks and open flames.
 - 3. Damaged or deteriorated materials shall not be used and shall be removed from the job site.
 - 4. All cardboard containers shall be stored in dry areas or on pallets. Packing materials shall be collected so as not to blow around the site.

DEFINITIONS & STANDARDS

5. All materials shall be stored in temperatures specified by the manufacturer. Submit proposed storage arrangements regarding temperature to the Architect and the materials manufacturer for review.

1.03 JOB CONDITIONS

- A. Do not deliver to site or install any material or system that has not been approved. Materials installed without approval may be required to be removed and replaced at no additional cost to the owner.
- B. Materials which have a temperature other than the application temperature of the manufacturer shall not be applied.
- C. All materials shall be installed according to manufacturer's specifications and shall be compatible with the existing materials used on site.
- D. Remove only as much existing roofing as can be replaced and made weathertight each day, including all flashing work.
- E. All surfaces to receive the new materials shall be thoroughly dry. Should surface moisture such as dew exist, the Contractor shall provide the necessary equipment to dry the surface prior to application.

1.04 CONDITIONS, DIMENSIONS AND QUANTITIES

- A. All conditions, dimensions and quantities shall be determined or verified by the Contractor. The Plans and details have been compiled from various sources and may not reflect the actual condition at the moment of construction. The Contractor is cautioned to take all precautions and make all investigations necessary to install the proposed work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

1.05 DEFINITION OF "ARCHITECT"

- A. Any reference to "Architect," "Engineer" or "Designer" in this Project Manual, Specification or on the drawings shall refer to CBI Consulting Inc., 250 Dorchester Avenue., Boston, Massachusetts 02127, (617) 268-8977, Steven Watchorn, Project Manager.

1.06 DEFINITION OF "OWNER"

- A. Any reference to the Owner shall be Town of Barnstable. Contact shall be Mark Marinaccio, Town Architect.

1.07 MINIMUM REQUIREMENTS

DEFINITIONS & STANDARDS

DEMOLITION OF FORMER OSTERVILLE
BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER GYM
HYANNIS, MASSACHUSETTS
CBI JOB NO.: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

- A. It is the intent of these contract documents to, in some cases, exceed the minimum requirements of the manufacturer. The new work shall be bid and installed as detailed.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 50 00

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 GENERAL

- A. The Contractor shall be responsible for providing and maintaining all temporary facilities until Substantial Completion. Removal of such prior to Substantial Completion must be with the concurrence of the Architect. The Contractor bears full responsibility for providing any facility removed prior to Substantial Completion
- B. Removal of all temporary facilities shall be a condition precedent to Substantial Completion unless directed otherwise by the Architect or specifically noted in the specifications.
- C. The Contractor must comply with all safety laws and regulations of the Commonwealth of Massachusetts, the United States Government, and local government agencies applicable to Work under this contract. The Contractor's attention is directed to the Commonwealth of Massachusetts, Department of Labor and Industries Regulation 454 CMR.

TEMPORARY FACILITIES

- D. Safety is the sole responsibility of the contractor on the job site. Contractor is notified that the building will be occupied during construction. The Architect does not have control of the job site in any way.

1.03 UTILITIES

- A. The contractor will be able to use without charge, electrical power and water. It is the responsibility of the Contractor to make provisions to extend the utility from the nearest service outlet designated by the Owner to the point of use. Any misuse will be cause for discontinuance of the utility whereupon the Contractor shall provide the service at his/her own expense. Electrical energy shall not be used for temporary heating purposes. Do not include any cost for use of electric power or water that may be supplied by the Owner in the Basic Construction Proposal.
1. Where heavy duty electric equipment drawing current in excess of fifteen (15) amperes is involved, the Contractor shall provide temporary service to supply the power.
 2. The temporary electric service shall include, but not be limited to labor, materials, and equipment necessary to supply temporary power of adequate capacity for the project.
 3. Transformers and meters, when required by the power company, will be furnished by the power company and the contractor shall pay the costs thereof.
- B. Temporary electrical Work shall be performed under the direct supervision of at least one master electrician, who will be present on the project at all times when such work is being performed.
- C. The Contractor shall furnish, install, and maintain lamps in operating condition. The Contractor, and each Subcontractor, shall furnish their own extension cords and additional lamps as may be required for their work. Temporary work of a special nature, not otherwise specified hereunder, shall be provided, maintained, and paid for the trade requiring same.
- D. All lamps installed in permanent lighting fixtures and used as temporary lights during the construction period shall be removed and replaced shortly before Substantial Completion by the set of lamps required to be provided under the Electrical section of the specifications.
- E. All temporary work shall be provided in conformity with the National Electric Code, State laws, and requirements of the power company. Particular attention is called to Commonwealth of Massachusetts, Department of Labor and Industries Regulation, 454 CMR.

TEMPORARY FACILITIES

1.04 SANITARY FACILITIES

- A. The Contractor shall NOT have use of sanitary toilet facilities within the building and must provide portable sanitary toilets for the use of their forces for the entire duration of the work. Toilets shall be cleaned and emptied twice weekly (minimum) and as directed by the Owner.
- B. Portable, temporary toilets shall be provided by the Contractor and shall be located as directed by the Owner.
- C. The Contractor:
 - 1. Assumes full responsibility for the use of the temporary toilets
 - 2. Pays all costs for operation, maintenance and cleaning.

1.05 TEMPORARY STRUCTURES AND MATERIAL HANDLING

- A. The Contractor shall provide such secure storage sheds, temporary buildings, or trailers as required for the performance of the Contract.
- B. Materials shall be handled, stored, installed, cleaned, and protected in accordance with the best practice in the industry and, except where otherwise specified in the Contract Documents, in accordance with manufacturer's specifications and directions.
- C. The Contractor must obtain the permission of the Owner for the placement of any storage facilities on site, and the Owner assumes no responsibility for articles stored.

1.06 TEMPORARY STAGING, STAIRS, CHUTES

- A. Except as otherwise specified, the Contractor shall furnish, install, maintain in safe condition, and remove all scaffolds, staging, and planking over 8 ft. in height, required for the use of all trades for proper execution of the Work, except as noted.
- B. The Contractor shall furnish, install, maintain in safe condition, and remove all temporary ramps, stairs, ladders, and similar items as required for the use of all trades for the proper execution of the Work.
- C. The Contractor shall furnish, install, maintain, and remove covered chutes from the work area. Such shall be in convenient locations and permit disposal of rubbish directly into trucks or disposal units.

- D. Debris shall not be allowed to fall freely from upper levels of the building. Materials shall not be thrown or dropped from open windows or the roof.
- E. The General Bidder is responsible for erecting and maintaining, in safe condition, all scaffolding or staging required on the job, as well as all hoisting, to perform all the work in their scope, for the use of all Sub-Contractors, and for use by the Architect who will need to review the work or mark or verify quantities on the project. Any scaffolding shall include a protective screen securely attached to the scaffold for the entire height of the scaffold.
- F. Provide any and all additional protection required to keep the building from being damaged by the staging, hoisting, or any construction work. Protect parapets and roof edges with plywood at all swing staging. Protect landscaping from mechanical lifts, scaffolding, and all construction activities.

1.07 HOISTING FACILITIES

- A. Except as otherwise specified, the Contractor shall provide, operate, and remove material hoists, cranes, and other hoisting as required for the performance of the Work by all trades. All such hoisting service shall be without cost to the Subcontractors and Sub-Bidders.

1.08 WEATHER PROTECTION

- A. The Contractor shall provide temporary enclosures and heat to permit work to be carried on during the months of November through March in compliance with MGL c.149 §44G (d). Without limitation this includes such items as excavation, pile driving, steel erection, erection of certain exterior wall panels, masonry, sealants, waterproofing, sheet metal work, roofing, and similar operations.
- B. "Weather Protection" means the temporary protection of that Work adversely affected by moisture, wind, and cold by covering, enclosing, and/or heating. This protection shall provide adequate working areas during the months of November through March as determined by the Owner and consistent with the construction schedule to permit the continuous progress of all Work necessary to maintain an orderly and efficient sequence of construction operations. The Contractor shall furnish and install "Weather Protection" material and be responsible for all costs, including heating required to maintain a minimum of 40 degrees F. at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials, or the applicable conditions set forth in the Contract Documents with added regard to performance obligations of the Contractor.
- C. Within thirty (30) calendar days after award of the Contract, the Contractor shall submit in writing, to the Architect for approval, three (3) copies of the proposed methods for "Weather Protection".

TEMPORARY FACILITIES

- D. The Contractor shall assume the entire responsibility for weather protection during construction (until Substantial Completion), and shall be liable for any damage to any Work caused by failure to supply proper weather protection and proper ventilation.
- E. Work damaged by frost shall be removed and replaced by and at the Contractor's expense and as directed by the Architect.
- F. It is to be specifically understood that the Contractor shall do no work under any conditions deemed unsuitable by the Contractor to the execution of the Work. This provision shall not constitute any waiver, release, or lessening of the Contractor's obligation to bring the Work to Substantial Completion within the period of time set forth in the Contract Documents.

1.09 PROTECTION

- A. Weather protection shall be provided for; weather conditions occurring or anticipated, the extent of the existing structure exposed, or any other possible hazard.
- B. Dust control, pedestrian protection, and traffic control measures shall be provided during the course of the work.
- C. Schedule and execute all work without exposing the sensitive building areas to the affects of inclement weather. Protect the existing structure and its contents against all risks, and repair or replace all damage to the Owner's satisfaction. Protect all exterior building surfaces, roofing, lighting, landscape areas, and pavement from damage.
- D. All new and temporary construction, including equipment and accessories, shall be secured from wind damage or blow-off.
- E. The Contractor shall provide all necessary temporary protection and barriers to segregate the work area and to prevent damage to adjacent areas. Also provide plywood protection for roofing adjacent to construction. Areas damaged because of inadequate protection will be repaired at no additional cost to the owner, as per these specifications and the recommendations of the Architect.
- F. Provide temporary barricades and other forms of protection as required to protect Owner's personnel, students, and general public from injury due to the work.
- G. Any deteriorated substrate which is discovered shall be promptly reported to the Architect.
- H. Safety on the job site is the sole responsibility of the contractor. The Contractor shall ensure that all Local, State, Federal, OSHA or other applicable safety

TEMPORARY FACILITIES

requirements are strictly accorded to. All OSHA safety requirements regarding items such as scaffolding, temporary protections, lift trucks, cranes, removal of debris, dust control, cleaning solvents, and high pressure water washing, sandblasting and equipment shall be ensured by the Contractor.

1.10 DEBRIS

- A. The Contractor will be responsible for the removal of all construction debris from the job site.
- B. Upon completion of each day and each phase of the work the Contractor shall leave the premises free of all debris and waste, in broom-clean condition. Overnight storage of material on site will be as approved by the Owner. The Contractor shall be responsible for keeping the site free of rubbish and debris, and in a neat and orderly condition at all times. The Contractor shall clean up and remove all accumulated rubbish and debris daily.
- C. The Owner's representative shall inspect the site daily. If it is determined that the site has not been cleaned of construction debris on a particular day the Contractor may be assessed \$100.00 for that day to be used to have the site cleaned by in house personnel. This shall be prepared by the Architect as a deduct change order to the contract.
- D. Debris resulting from the new work shall be placed in covered containers provided by the Contractor and legally disposed of. Burning will not be permitted on site. Dumpster locations shall be approved by the Owner.

1.11 TEMPORARY NOISE AND POLLUTION CONTROL

- A. All work performed under the Contract shall conform to the requirements of Chapter 111, Sections 31C and 142D of the General Laws, Commonwealth of Massachusetts and Department of Public Health.

1.12 CONSTRUCTION PARKING CONTROL

- A. The Contractor shall control trucks and worker's vehicles to prevent unnecessary congestion in the neighborhood of the project. See Site Plan for allowable on site parking area.
- B. The schedule and location of all deliveries of materials must be coordinated and approved by the Owner.
- C. All on-site parking will be at the direction of the Owner.

1.13 TEMPORARY SITE STORAGE

- A. The Owner shall designate an area for temporary site storage on the site. All materials shall be stored in locked storage trailers or container boxes.
- B. Storage of materials will not be permitted within any building in the scope of work.

1.14 TEMPORARY CONSTRUCTION FENCE

- A. The Contractor shall be responsible for providing and maintaining temporary fencing and barricades around the construction as may be necessary to assure the safety of all persons authorized or unauthorized. Such protective measures shall also be located and constructed as required by local, state, and federal ordinances, laws, codes, or regulations.

1.15 FIELD OFFICES AND SHEDS

- A. The Owner will not provide any space within the buildings for use by the Contractor as an office. There is space on the property for contractor supplied site trailers or storage units. Locations as directed by the Owner.
- B. Weekly job meetings shall be held at the job site.
- C. The Contractor shall provide a suitable Project Trailer at this location, 400 SF minimum, that shall be accessible at all times to the Owner's Representative, the Architect, and their authorized representatives.
- D. The following furniture and equipment shall be provided in good condition. The furniture and equipment shall remain the property of the Contractor after Substantial completion of the Work.
 - 1. One desk and four chairs.
 - 2. One coat rack and 12 wall coat hooks.
 - 3. One plan rack and shelves for samples.
 - 4. One 4-drawer metal file cabinet with lock and key.
 - 5. One accurate outside mercury thermometer
 - 6. Two wall calendars
 - 7. One Conference table, 4' x 10', with benches both sides

8. Two 4' x 8' white marker boards, with two (2) boxes of assorted dry erase markers.
 9. One facsimile machine with copying capability and a dedicated phone line for the FAX machine.
- E. The offices, equipment, and furnishings shall be maintained by the **Contractor** in a clean and orderly condition, and be removed upon receipt of written direction of the **Owner's Representative**.
- F. Provide wireless internet service and wireless printer in the office for use by the Owner's Project Manager.

1.16 TELEPHONES

- A. No telephone service will be provided by the Owner.
- B. A site telephone shall be provided by the Contractor and may be a cellular type for each site under construction. All telephone numbers shall be available to the project team. Provide pager for the project superintendent at the job site.
- C. Provide twenty-four (24) hour emergency phone numbers for the Contractor's Project Manager and Superintendent.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 51 00

PROTECTION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 PROTECTION OF PERSONS & PROPERTIES

- A. The site will be occupied during construction. The contractor shall have complete control of the job site. The Contractor shall take all necessary precautions to ensure the public safety and convenience of visitors during construction. Safety is the sole responsibility of the contractor, regardless of what is set forth in this document. The architect does not have control of the job site, or means and methods, in any way.
- B. Any damage to buildings, roads, (public and private), concrete walks, bituminous concrete areas, fences, rails, lawn areas, trees, shrubbery, poles, underground utilities, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner.
- C. The Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged after the installation of new work to the complete satisfaction and at no expense to the Owner. All repair and replacement work shall match the existing in kind and appearance.

1.03 TEMPORARY PROTECTION

- A. The Contractor shall:
1. Protect excavations, trenches, buildings, and materials at all times from rain water, ground water, backing-up, or leakage of sewers, drains, or other piping, or from water damage of any origin. Provide all pumps, piping, coverings, and other materials and equipment as required by job conditions to accomplish this requirement.
 2. In addition to the weather protection during the months of November to March specified elsewhere, provide temporary watertight enclosures for openings in exterior walls and in roof decks when and as required to protect the Work from damage by inclement weather. Temporary enclosures shall be provided with adequate means of ventilation to prevent accumulation of moisture in the buildings.
 3. Provide temporary wood doors for exterior entrances and elsewhere when required. Permanent door enclosures shall not be used as temporary enclosures.
 4. Protect sills, jambs, and heads of openings through which materials are handled.
 5. Protect decks and slabs to receive work by other trades from any soiling which will prevent proper adhesion of subsequent Work. Decks and slabs shall be left clean and free of blemishes at the time other trades begin the application of their work.
 6. Protect concrete slabs to remain exposed and finished floors against mechanical damage, plaster droppings, oil, grease, paint, or other material which will stain the floor finish. Install and maintain adequate strips of building paper or other protection on finished floors in rooms where future Work will be done by other trades.
 7. Protect all surfaces to receive work by other trades from any soiling which will prevent proper execution of subsequent work
 8. Protect other areas, furniture, and private property of the resident and the Owner. Any areas damaged by the Contractor shall be restored to the original condition or compensated at the Contractor's expense.
- B. Roof surfaces and waterproofed surfaces shall not be subjected to traffic nor shall they be used for storage of materials. Where some activity must take place in order to carry out the Work, adequate protection must be provided.

- C. After the installation of the Work by any Subcontractor is completed, the Contractor shall be responsible for its protection and for repairing, replacing, or cleaning any such Work which has been damaged by other trades or by any other cause, so that all Work is in first class condition at the time of Substantial Completion.

1.04 ACCESS

- A. The Contractor shall, at all times, leave an unobstructed way along walks and roadways, and shall maintain barriers and lights for the protection of all persons and property in all locations where materials are stored or work is in progress.

1.05 SECURITY

- A. The Contractor shall be responsible for providing all security precautions necessary to protect the Contractor's and Owner's interests.
- B. Where excavation is involved, the Contractor shall be responsible for providing continuous watchmen service as necessary, to insure adequate protection of the general public.

1.06 NOISE AND DUST CONTROL

- A. The Contractor shall take special measures to protect the residents, neighbors, and general public from noise, dust, and other disturbances by:
 - 1. Keeping common pedestrian and vehicular circulation areas clean and unobstructed;
 - 2. Insulating work area from occupied portions as far as possible; and
 - 3. Sealing dust and fumes from contaminating occupied spaces.

1.07 FIRE PROTECTION

- A. The Contractor shall take necessary precautions to insure against fire during construction. The Contractor shall be responsible to insure that the area within contract limits is kept orderly and clean and that combustible rubbish and construction debris is promptly removed from the site.
- B. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work. The Contractor's attention is directed to the requirements of the Commonwealth of Massachusetts, Department of Labor and Workforce Development Regulation 454 CMR.

DEMOLITION OF FORMER OSTERVILLE
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Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

1.08 WIND PROTECTION

- A. Should high wind warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the Work, and to the adjacent property.

1.09 WEATHER PROTECTION

- A. The Contractor shall provide Weather Protection as required by Specification Section 01 50 00 Temporary Facilities and any other specific requirements of the Contract Documents.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENREAL REQUIREMENTS

SECTION 01 52 00

CLEANING UP

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.
- E. This section supplements the General Conditions.
- F. Consult the individual sections of the specifications for cleaning of Work installed under those sections.

1.02 CLEANING DURING CONSTRUCTION

- A. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
 - 1. Do not burn or bury rubbish and waste materials on the site.
 - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 3. Do not dispose of wastes into streams or waterways.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

- C. Do not allow materials and rubbish to drop free or be thrown from upper floors, but remove by use of a material hoist or rubbish chutes.
- D. Maintain the Site free from accumulations of waste, debris, and rubbish.
- E. Provide on-site containers for collection of waste materials and rubbish.
- F. At the end of each day, remove and legally dispose waste materials and rubbish from site.
- G. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.

1.03 FINAL CLEANING

- A. Prior to submitting a request to the Architect to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces and verify that all waste materials, rubbish, tools, equipment, machinery, and surplus materials have been removed, and that all sight-exposed surfaces are clean. Leave the Project clean and ready for occupancy.
- B. Unless otherwise specified under other sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.
- C. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing.
- D. Employ experienced workmen or professional cleaners for final cleaning.
- E. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
- F. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.
- G. All broken or defective glass caused by the Contractor's Work shall be replaced at the expense of the Contractor.
- H. Remove grease, mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective specifications.

- I. Clean and polish all new and existing glass and plastic glazing (if any) throughout the building(s), on both sides. Clean plastic glazing in accordance with the manufacturer's directions. This cleaning shall be completed by qualified window cleaners at the expense of the Contractor just prior to acceptance of the Work.
- J. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.
- K. Polish glossy surfaces to a clear shine.
- L. Leave all architectural metals, hardware, and fixtures in undamaged, polished conditions.
- M. Leave pipe and duct spaces, plenums, furred spaces and the like clean of debris and decayable materials.
- N. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken not to damage such manufacturer's or Subcontractor's finish. In cleaning glass and finish surfaces, care shall be taken not to use detergents or other cleaning agents which may stain adjoining finish surfaces. Any damage to finishes caused by cleaning operations shall be repaired at the Contractor's expense.
- O. Broom clean exposed concrete surfaces and paved surfaces. Rake clean other surfaces of grounds.
- P. Ventilating systems - Replace filters and clean ducts, blowers, and coils if units were operated during construction.
- Q. Owner's responsibility for cleaning commences at Substantial Completion.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 70 00

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 COMPLETION OF WORK

- A. The site shall be cleaned of all debris resulting from the work and areas damaged during the course of the work restored to the satisfaction of the architect and the Owner.
- B. The Contractor shall notify the Architect and Owner that the work is completed and Project Manual requirements have been met. The Architect shall review the completed work with the Contractor within seven (7) calendar days of notification. Any deficiencies observed at the time will be conveyed directly to the Contractor with a written confirmation, after which the Contractor shall correct the stated deficiencies to the satisfaction of the Architect within fourteen (14) calendar days prior to demobilization from the site.
- C. After satisfactory completion of the above, the work shall be considered complete with notification by the Architect to the Owner.
- D. The Contractor shall submit all lien waivers and warranties at this time of final payment.
- E. All guarantees, as required in any Section of the Project Manual shall be submitted for approval prior to final payment.

- F. Contractor shall maintain and record all changes to the plans throughout the entire project and shall submit as-built drawings of the entire project, in electronic AutoCAD and PDF format, prior to final payment. The Town and the Architect will provide existing AutoCAD base files for the sole purpose of the Contractor to generate the as-built drawings from.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

- A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
- B. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.05 PROJECT CONDITIONS

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
- D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements , with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.

- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 – PRODUCTS

2.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

2.02 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 2. Grid or axis for structures.
- H. Periodically verify layouts by same means.
- I. Maintain a complete and accurate log of control and survey work as it progresses.
- 2.03 PROGRESS CLEANING
- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
 - B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
 - C. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.
- 2.04 PROTECTION OF INSTALLED WORK
- A. Protect installed work from damage by construction operations.
 - B. Provide special protection where specified in individual specification sections.
 - C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
 - D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
 - E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
 - F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
 - G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.
- 2.05 ADJUSTING
- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

2.06 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and catch basins.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

2.07 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect.
 - 2. Provide copies to Owner.
 - 3. Provide copies to Architect and Owner.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

DEMOLITION OF FORMER OSTERVILLE
BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER GYM
HYANNIS, MASSACHUSETTS
CBI JOB NO.: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 74 19 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the Construction Waste Management and Disposal Work required to complete the Work of the Contract including all the Construction Waste Management and Disposal Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the Construction Waste Management and Disposal Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Construction Waste Management and Disposal Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. Construction Waste Management and Disposal Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required

in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

2. Supply all shoring and protection necessary to protect the Community Center Gym occupants, and landscape areas. All means and methods are the responsibility of the Contractor. The Contractor is solely responsible for safety on the job site.

1.03 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 1. Burning on the project site.
 2. Burying on the project site.
 3. Dumping or burying on other property, public or private.
 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.04 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 2. Submit Report on a form acceptable to Owner.
 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.

- d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
6. Material Reused on Project: Include the following information for each:
- a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 3 – EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.

1. Pre-bid meeting.
 2. Pre-construction meeting.
 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
1. Provide containers as required.
 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 02 41 00

DEMOLITION

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the Demolition Work required to complete the Work of the Contract including all the Demolition Work shown on the plans, listed in the specification, and needed to demolish the existing structure. Coordinate the Demolition Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Demolition Work. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. Demolition Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

2. Supply all shoring and protection necessary to protect the Community Center Gym occupants, and landscape areas. All means and methods are the responsibility of the Contractor. The Contractor is solely responsible for safety on the job site.
 3. Demolition and removal of all Osterville Bay School existing construction, including all asbestos, PC Base Lead Paint Awareness, as described in related section of this Project Manual.
 4. Disconnection and capping of utilities including:
 - a. Osterville Bay School sewer, gas, water, and electrical.
 5. Demolition and removal of trees and shrubs, asphalt, walkways, stairwells, and vault structures.
 6. Demolition and removal of volleyball net and posts.
 7. Demolition and removal of existing oil tank and stored oil.
 8. Salvage and deliver to the Town of Barnstable Facility Department, the school's boiler and flag pole.
- C. Add Alternate #1:
1. **Add Alternate #1: Community Center Gym Demolition**
 - a. Completely remove and dispose of the entire Osterville Community Center Gym in its entirety, including all hazardous materials including asbestos and lead paint and foundations and all utilities. Utilities to be cut and capped in advance of demolition.
 - b. Remove and dispose of the entire existing septic system, including all sewer lines, septic tanks and leaching pits, to the extent indicated on the drawings.
 - c. Cut and cap, remove and dispose of all underground utilities, to the extent indicated on the drawings.
 - d. Remove and dispose of asphalt parking Lot B, catch basins and guardrails.
 - e. Remove and dispose of concrete walkway.
 - f. Remove and dispose of tree adjacent to Community Building.
 - g. Back fill entire site where building foundation and septic tanks had been removed.
 - h. Community Building Structural Narrative:

- The community building is a one-story, slab-on-grade building constructed in the 1980's. The original design drawings for the building are available and are assumed to represent the as-built conditions. Note that the contractor is responsible for verifying all existing conditions prior to beginning work. The drawings show the following general building structure:
 - 3'-0" wide x 12" deep reinforced concrete strip footings along all perimeter walls and below the bearing wall between the gym and the administration area. Footings are shown to be a minimum of 4'-0" below grade, though some areas may be deeper due to the sloping site.
 - 12" thick reinforced concrete foundation walls along the full perimeter of the building and below the bearing wall between the gym and the administration area. The top of the concrete wall varies due to the slope at the site. Note that the damproofing on the exterior of the foundation walls has been determined to be asbestos containing material. See the hazardous materials specifications for more information.
 - A 4" thick slab-on-grade with welded-wire fabric reinforcing at both the gymnasium and the administration area.
 - 10" reinforced concrete thickened slabs below the CMU partition walls in the administration area.
 - 12" reinforced CMU bearing walls at all exterior walls and at the wall between the gymnasium and the administration area. Masonry above openings in the masonry bearing walls are supported by steel lintels.
 - 30" deep open-web steel roof joists supporting a 1 1/2" deep x 22 gauge steel roof deck over the gymnasium.
 - 14" deep open-web steel roof joists supporting a 1 1/2" deep x 22 gauge steel roof deck over the administration area.
 - 16" deep open-web steel roof joists supporting a 1 1/2" deep x 22 gauge steel roof deck over the bathroom area.
 - 12" deep wide-flange steel beam over the main entrance, supporting a 12" reinforced CMU parapet wall.

1.03 RELATED WORK

- A. The following items of related Work are specified and included in other Sections of the Specifications:
1. Section 02 65 00 - Underground Storage Tank Removal.
 2. Section 12 82 00 - Hazardous Materials Report and Supplemental Report.
 3. Section 02 82 13 - Asbestos Abatement
 4. Section 02 83 10 - Lead-Based Paint Awareness
 5. Section 02 84 16 - Lighting Ballast and Mercury: Removal of equipment containing substances regulated under the Federal Toxic Substances Control Act (TSCA), including but not limited to PCB- and mercury-containing equipment.
 6. Section 22 00 00 - Plumbing
 7. Section 23 00 00 - HVAC
 8. Section 26 00 00 - Electrical
 9. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal.
 10. Section 31 20 00 - Earth Moving for Utilities and Pavement.
 11. Section 31 22 00 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
 12. Section 31 23 00 - Excavation and Backfill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
 13. Section 31 25 00 - Erosion and Sedimentation Controls

1.04 QUALITY ASSURANCE

- A. Supervision:
1. Engage and assign supervision of shoring and bracing Work to qualified personnel.
- B. Regulations:
1. Comply with local codes and ordinances of governing authorities having jurisdiction.

C. Demolition Firm Qualifications: Company specializing in the type of work required.

1. Minimum of 5 years of documented experience.

1.05 SUBMITTALS

A. Schedule:

1. Submit schedule indicating proposed methods and sequence of operations for Selective Demolition.
2. Include coordination for shut-off, capping, and continuation of utility services in scope area.

B. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

C. Site Plan: Showing:

1. Vegetation to be protected.
2. Areas for temporary construction and field offices.
3. Areas for temporary and permanent placement of removed materials.

D. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.

1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
2. Identify demolition firm and submit qualifications.
3. Include a summary of safety procedures.

E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 JOB CONDITIONS

A. Condition of Structures:

1. Owner assumes no responsibility for actual condition of items or structures to be demolished.
2. Conditions existing at time of commencement of Contract will be maintained by Owner insofar as practicable.

3. The school building to be demolished is in a state of partial collapse and is **UNSAFE**. The Awarding Authority and Architect assume no responsibility for the condition of the structure to be demolished.
4. The school building to be demolished will be unoccupied. However, adjacent properties will be occupied and special care shall be taken to protect adjacent properties, protect the public, and control dust and noise.

B. Subsurface Conditions:

1. Subsurface conditions that are detrimental to the Work of this Contract are not anticipated. Unanticipated subsurface conditions of a minor nature, such as boulders, shall not result in any additional compensation. Notify the Architect immediately in writing if subsurface conditions are significantly deficient for demolition.

C. Protections:

1. Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition Work. Safety is the sole responsibility of the Contractor.
2. Provide protective measures to provide free and safe passage of Owner's personnel and general public to and from area of selective demolition.
3. Erect temporary covered passageways as required by authorities having jurisdiction.
4. Take measures to protect against windblown dust, obtain Owner's approval of means used for dust control.
5. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or Work to remain.
6. Protect from damage existing finish Work that is to remain in place and becomes exposed during demolition operations.
7. Protect adjacent materials and finishes with suitable coverings when necessary including, but not limited to, automobiles in parking lot adjacent to building which will remain in use during Work to be performed.
8. Ensure silt and sediment resulting from exposed soils does not exit the site. Install silt fence or other methods of erosion and sedimentation control approved by City officials. The silt fence, hay bales, and other

methods of erosion control shall remain in-place upon completion of work.

9. Ensure that silt or sediment is not tracked onto roadways by installation of a tracking mat.
 10. Remove protections including erosion controls at completion of Work.
- D. Damages: Promptly repair damages caused to building or property, including cars, by demolition Work at no cost to Owner.
- E. Traffic:
1. Conduct Demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, parking lot B use, and other adjacent occupied or used facilities.
 2. Do not close, block, or otherwise obstruct streets, walks, parking lot, or other occupied or used facilities without written permission from the authorities having jurisdiction.
 3. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Utility Services:
1. Maintain existing utilities to remain, keep in service, and protect against damage during demolition operations.
 2. Do not interrupt existing utilities service occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide 48 hours' notice if service must be interrupted.
 3. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- F. Environmental Controls:
1. Comply with governing regulations pertaining to environmental protection.
 2. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Fill Material: As specified in Section 31 23 00 – Excavation and Backfill.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Before start of Selective Demolition Work, inspect areas in which Work will be performed.
- B. Remove the entire building designated Osterville Bay School.
- C. Remove portions of existing buildings in the following sequence:
 - 1. School.
 - 2. Paving.
 - 3. Underground Storage Tank
 - 4. Community Center (Add Alternate No1).
- D. Remove paving and curbs as required to accomplish new work.
- E. Remove underground tanks that contain or once contained petroleum products; fill and bury other types of tanks.
- F. Remove manholes and manhole covers, curb inlets and catch basins.
- G. Remove fences and gates.
- H. Remove other items indicated, for salvage, and relocation.
- I. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.02 PREPARATION

- A. Structure Safety:
 - 1. If necessary, provide exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structures to be demolished and adjacent facilities to remain.
- B. Shoring and Bracing

1. If shoring and bracing is required, locate the system to clear permanent construction and to permit the completion of the Work.
 2. Provide shoring and bracing system adequately anchored and braced to resist natural forces.
 3. No shoring and bracing system shall remain at the completion of the Work.
- C. Comply with other requirements specified in Section 01 70 00.
- D. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
1. Obtain required permits.
 2. Use of explosives is not permitted.
 3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 4. Provide, erect, and maintain temporary barriers and security devices.
 5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 7. Do not close or obstruct roadways or sidewalks without permit.
 8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- E. Do not begin removal until receipt of notification to proceed from Owner.
- F. Do not begin removal until built elements to be salvaged or relocated have been removed.
- G. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

- H. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
- I. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- J. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- K. Hazardous Materials: Comply with **29 CFR 1926** and state and local regulations.
- L. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Comply with requirements of Section 01 74 19 – Construction Waste Management and Disposal.
 - 2. Dismantle existing construction and separate materials.
 - 3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- M. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
- N. Underground Storage Tanks: Remove and dispose of as specified in Section 02 65 00.

3.03 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 DEMOLITION

A. General:

- 1. Demolish existing construction designated to be demolished in a systematic manner, according to approved alternative plan included in this specification.
- 2. Use such methods as required to complete Work indicated on Drawings in accordance with Demolition Schedule and governing regulations.
- 3. If unanticipated mechanical, electrical, or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict with Consultant.
- 4. Demolish and remove existing construction required for the proper completion of site work. Foundation hole must be clean of any existing building debris.

B. Disposal of Demolished Materials:

- 1. Remove debris, rubbish, and other materials resulting from demolition operations from site.
- 2. Transport and legally dispose of materials off site.
- 3. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution. Present receipts from certified waste disposal firms confirming hazardous waste disposal.

4. See attached specification for addressing all hazardous materials.
 5. Burning of removed materials is not permitted on project site.
- C. Pollution Controls:
1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection. Take necessary measures to prevent silt and soils leaving the site on vehicle tires during demolition activities. Any soils remaining on the public way resulting from demolition activities are to be swept and properly disposed of daily at the Contractor's expense.

3.05 CLEANING AND REPAIR

- A. On completion of demolition Work, remove tools, equipment, and demolished materials from site. Remove debris on a daily basis.
- B. Repair demolition performed in excess of that required.
- C. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.
- D. Remove debris, junk, and trash from site.
- E. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
- F. Leave site in clean condition, ready for subsequent work.
- G. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 02 65 00

UNDERGROUND STORAGE TANK REMOVAL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 00 00 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract. Cooperate with the Engineer with regard to analytical testing requirements and sample collection, and as directed with regard to soil handling and closure documentation.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.
- E. Refer to the drawings for further definition of location, extent, and details of the work described herein. Specifically, refer to the Underground Storage Tank Removal Plan (HA-07) for the features referenced herein.
- F. Where referenced, standard specifications of Technical Societies, Manufacturers' Associations, and Federal Agencies shall include all amendments current as of the date of issue of these Specifications.
- G. The Contractor shall note that underground utilities and structural elements not designated for demolition on the project drawings are to be protected from damage during the execution of the work.

1.02 WORK TO BE PERFORMED

- A. Provide all labor, equipment, implements and materials required to remove and dispose of one (1) existing underground fuel oil storage tank (UST), located

adjacent to the on-site boiler room, in the location depicted on the Underground Storage Tank Removal Plan (HA-07), and to disconnect and remove fuel piping between the UST and building. The UST has a capacity of 10,000 gallons. As of March 2017, approximately 3,500 gallons of residual liquids, composed of oil and water in unknown fractions, were observed in the UST, all of which shall be considered a waste product. The following items are major items of work included:

1. Remove the concrete pad on top of the UST.
 2. Enter, clean, and remove any residual liquids and sludges contained in the UST, containerize, transport and dispose off-site in accordance with local, state and federal regulations.
 3. Disconnect, clean, cut, remove and dispose supply, return, and vent lines between the UST and building as indicated on site plans. Fuel lines shall be removed to the exterior of the building and capped at the penetration in the building slab.
 4. Remove the UST from subgrade, load and dispose at a state-licensed salvaging facility. Demolish and remove any concrete tie-down slabs, and dispose off-site in accordance with state and federal regulations. Obtain and submit appropriate documentation of disposal of the UST, residuals, and any other components required to be disposed.
 5. Support sample collection activities by the Engineer to evaluate soil conditions and determination of whether a reportable petroleum release has occurred. Be prepared to conduct excavation activities as directed by the Engineer in response to a reportable release of petroleum. The Engineer shall collect post-excavation soil characterization samples to document the conditions at closure.
 6. Backfill and compact the excavated area per the demolition drawings and associated notes.
- B. In the event that additional USTs are identified in the vicinity of the site, Contractor shall notify Architect of identification of additional tank(s). The Architect shall notify the owner. Contractor shall proceed with tank removal in accordance with the specification at the direction of the Owner and Architect

1.03 CONTRACTOR QUALIFICATIONS

- A. Work done in accordance with this section shall be performed by a contractor who demonstrates the following minimum experience performing work of similar scope to this Project:
1. At least three UST removals in the previous five years, including at least one UST removal where immediate response actions were required in

accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.000).

- B. All employees performing work in accordance with this section shall be trained in accordance with all pertinent local, state and federal regulations, including but not limited to that required by OSHA Hazardous Waste Operations and Emergency Response (29 CFR 1910.120 / 1926.65). Staff must additionally possess the following minimum qualifications to perform the work:
1. Hydraulics licenses for all heavy equipment operators
 2. Recent refresher training (within the previous year) for OSHA 1910.120/1926.65
 3. Hazardous materials endorsements, EPA registrations and commercial drivers' licenses for all personnel involved in transportation of hazardous materials
 4. Confined-space entry training shall be required of any personnel entering and manually cleaning the UST, and relevant supervisory training shall be required of any personnel overseeing such entry.

1.04 REFERENCE STANDARDS

- A. Occupational Safety
1. 29 CFR 1910.120 and 1926.65: Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response. Where one citation is included below, the second citation is implied.
 2. 29 CFR 1910.146 Occupational Safety and Health Administration Confined Space Entry.
 3. 520 CMR 14.00: Excavation and Trench Safety
 4. National Fire Protection Association (NFPA) 30: Flammable and Combustible Liquids Code
 5. NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response
- B. Hazardous Materials Transportation, Storage and Disposal
1. 310 CMR 40.000: Massachusetts Contingency Plan
 2. 310 CMR 80.000: Massachusetts Underground Storage Tank Regulations
 3. 527 CMR 9.00: Massachusetts Fire Code, Tanks and Containers
 4. 40 CFR 260-265 and 280: Resource Conservation and Recovery Act

5. 49 CFR 170-180: Hazardous Material Transportation Regulations

C. Tank Closure

1. American Petroleum Institute (API) 1604: Recommended Practice for the Removal and Disposal of Used Underground Petroleum Storage Tanks
2. Comm. #402-96: Commonwealth of Massachusetts Underground Storage Tank Closure Assessment Manual

1.05 RELATED WORK

- A. Examine all other Sections of the Specifications and all other drawings and determine the relationship of the work under this Section to the work of other trades. Cooperate with all trades, and coordinate all work under this Section with all trades.
- B. Contractor shall be familiar with other project drawings and specifications whose work elements as they interact with this section. Specific attention is directed to the demolition plans and notes, including direction regarding removal and backfill of subsurface piping and structures.
- C. Where in conflict with guidance in those sections, this section shall govern the performance of work related to the fuel tank, piping and appurtenances.

1.06 PERMITS, FEES, INSPECTION, CERTIFICATES

- A. Notify DigSafe no less than 72 business hours prior to the commencement of excavation work. Locate and clear all utilities in the work area.
- B. Apply for, obtain and pay for all permits and inspections required. Pay any required fees.
 1. Contractor is responsible to complete form FP-292 and arrange local fire department observation of UST removal, as required, and to coordinate and obtain additional local permits as required.
 2. Contractor is required to acquire any permits necessary for the performance of the work, including but not limited to trench permits in accordance with 520 CMR 14.00, as applicable, and any permits required for cutting, torch welding, or other methods associated with the removal of the UST and appurtenances.
- C. Obey pertinent Federal, State, and Municipal laws, bylaws, codes and regulations, and authorities having jurisdiction, including but not limited to the regulations listed in Part 1.3.

1.07 SUBMITTALS

- A. Prior to the commencement of work, provide the following submittals to the Engineer. Provide five business days' notice of the date of UST removal:
1. DigSafe® confirmation number
 2. Health and Safety Plan (HASP) for Engineer's record, and documentation of appropriate training for the work, in accordance with OSHA regulations and General Contractor requirements. Contractor bears sole responsibility for implementation of the HASP, and the Engineer, Architect and Owner bear no responsibility for the content of the HASP.
 3. Documentation supporting the implementation of any structural controls required to maintain the site, including shoring, trenching or other related components as applicable. If structural controls (shoring, trench boxes, etc.) are required, structural support plans shall be prepared and sealed by a Massachusetts-licensed Professional Engineer of competent discipline.
 4. Fully executed (signed by the Owner, Contractor and local Fire Department) Form FP-292: Application and Permit for Storage Tank Removal.
 5. The location and MassDEP Tank Yard registration number for the UST disposal facility, and the location of the disposal facilities for waste liquids and residuals generated during UST removal activities.
 6. A work plan including a schedule and depicting the proposed work areas, including proposed exclusion zones, staging areas, stockpile locations, laydown areas, and areas of ingress and egress as needed.
 7. All required licenses, certifications, and ID numbers associated with the removal and transportation of regulated wastes and/or hazardous waste. If subcontractors are to be employed for any component of the work, licenses, certifications, and ID numbers for the applicable portions of the work shall be submitted.
 8. Documentation of the backfill source.
- B. Within seven days of the completion of the work, submit manifests, Bills of Lading, disposal tickets, tank ledgers, and other appropriate information related to the disposal of the UST, related appurtenances, concrete, residuals, and waste products.

1.08 HEALTH AND SAFETY

- A. The Contractor shall prepare a Health and Safety Plan (HASP) that addresses safe working conditions relative to chemical constituents in soil, groundwater

and air. The HASP shall be prepared in conformance with OSHA requirements (29 CFR 1926.65) and shall, at a minimum, include the following information:

1. Identification of the Contractor's Site Safety Officer and the appropriate chain of command, including a health and safety manager and emergency coordinator, if warranted.
2. A job hazard assessment for each project task and description of hazard communication practices.
3. Use of personnel protective equipment (PPE), including a protocol for upgrading levels of PPE as necessary.
4. Protocols for ensuring safe entry and cleaning of the UST in accordance with local, state and federal requirements.
5. Monitoring requirements to ensure worker health and safety during entry and cleaning of the UST.
6. Procedures for air monitoring and respiratory protection.
7. Traffic control requirements, as warranted.
8. Other requirements as included in 29 CFR 1926.65.
9. The Contractor shall maintain a copy of the HASP on site and make it available for review as requested by the Engineer and local authorities.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Polyethylene sheeting, 6-mil minimum thickness, 10-foot minimum width.
- B. Spill containment materials including, but not limited to, booms and/or pads, and the tools to collect the materials after use and must be maintained on-site.
- C. Granular Absorbent: Speedi-Dri or approved equal.
- D. Clean, sealable, 17HDOT, 55-gallon drums shall be available to collect materials used to control or contain any spills that may occur during tank removal prior to disposal at an approved disposal facility.
- E. Backfill materials shall be granular borrow material from an off-site source or local borrow not containing solid waste, debris, or deleterious materials, and in conformance with other drawings and sections.
- F. Steel plates, barrels, caution tape, snow fencing, etc. shall be provided as necessary for overnight protection of excavation areas, and shall conform with all requirements of the local Trench Permit, and meet standards published by the Massachusetts Department of Transportation (MassDOT) for such materials.

2.02 TOOLS AND EQUIPMENT

- A. Contractor shall provide equipment and tools as needed to complete the project, including but not limited to the following:
 - 1. Heavy equipment (e.g. vacuum truck, wheel loader, excavator, etc.) and qualified operators.
 - 2. Hand tools (e.g. shovels, picks, etc.).
 - 3. Any and all materials necessary for safe entry into the UST for manual cleaning, including but not limited to tripods, explosive gas meters, ventilation equipment and associated appurtenances.
- B. Electrified tools and equipment must be intrinsically safe and grounded to reduce the risk of electric spark.
- C. The Contractor shall have available sufficient inventory of materials necessary for the job, including protective clothing, respirators, filter cartridges, tape, and polyethylene sheeting of proper size and thickness.
- D. The Contractor shall be responsible to supply power and water as needed to complete work.

PART 3 - EXECUTION

3.01 PRE-EXCAVATION

- A. Excavation shall not commence until the Contractor has marked the proposed limits of excavation, notified DigSafe, and waited the appropriate duration.
- B. Structural controls will be implemented, if warranted to prevent unanticipated movement of the UST or structural damage to site features intended to remain including the adjacent boiler room.
- C. An Exclusion Zone shall be established around the excavation area with barrels, caution tape, snow fencing, etc. to limit unauthorized access to the work area.
- D. The Contractor shall provide temporary erosion, sedimentation, and storm water control measures as necessary during UST removal activities.

3.02 EXPOSURE, ENTRY AND CLEANING

- A. Contractor shall expose the top of the UST and remove appurtenances above the UST to facilitate access for emptying and cleaning the UST.
- B. Contractor shall remove and containerize residual liquids from the UST to the extent feasible, then enter and manually clean the UST interior.

- C. Cleaning shall be deemed complete when residual solids and sludge has been removed from the inner surface of the UST and residual liquids have been extracted and containerized to the maximum extent practicable.

3.03 FUEL PIPING

- A. Fuel lines shall be vacuumed clean concurrent with the UST cleaning activities, cut at the UST to disconnect the lines, and removed to the exterior building foundation wall. The location of the fuel piping as depicted on the Underground Storage Tank Removal Plan (HA-07) is approximate, and the actual pipe lines will be identified in the field during UST removal activities. Fuel lines must be removed up to the foundation wall.
- B. All disconnected fuel piping shall be disposed off-site in accordance with state and federal regulations.

3.04 UST REMOVAL AND DISPOSAL

- A. The contractor shall expose the top of the UST to the extent necessary to remove the UST from the subsurface. Soil removed during UST exposure shall be stored on polyethylene sheeting in the vicinity of the excavation and the stockpile shall be covered and secured at the conclusion of each working day.
 - 1. Stop excavation and immediately inform Engineer if material exhibits characteristics of contamination (odors, staining, sheens).
 - 2. If contaminated soil is encountered, the Contractor shall notify the Owner and Engineer. The Owner or Engineer will notify MassDEP if applicable, and will direct response actions as warranted. Contractor shall be prepared to remove soil at the direction of the Engineer prior to completion of the work.
 - 3. Material excavated in order to expose the UST shall be reused as backfill unless contaminated.
- B. Metal tie-down straps connecting the UST to the underlying concrete slab shall be disconnected to facilitate UST removal. The Contractor shall demolish, remove and dispose of concrete tie-down slabs to the extent that they are present.
- C. The size of the excavation shall be kept as small as practicable to conduct the work. The excavation shall be made in open cut and no tunneling will be allowed.
- D. The tank shall be lifted from the excavation and disposed off-site in accordance with local and state regulations.

1. The UST shall become the property and responsibility of the Contractor and shall be removed from the site and disposed of in accordance with the applicable regulations at a Massachusetts tank yard.
 2. Tank cutting shall be performed in accordance with municipal ordinances, the Contractor's Site Specific HASP, and in accordance with any Hot Work permits, if required.
 3. Adequate excavation support shall be provided if the Contractor must enter the excavation to support removal activities.
- E. The Contractor shall remove and dispose of all existing tank appurtenances and piping to the limits depicted on the Underground Storage Tank Removal Plan (HA-07).
- F. The Contractor shall provide appropriate security measures and engineered controls to prevent unauthorized access to the excavation area following UST removal and until the completion of backfilling.
- G. Backfill and compact the excavation area upon approval from the Engineer.
1. Contractor shall note that, per parts 3.05 and 3.06 of this Section, the excavation area may not be backfilled for a matter of days following the UST removal, and shall be prepared to secure the site and temporarily demobilize.
 2. The UST grave shall be stabilized to prevent collapse and secured to prevent unauthorized access during any interim period between UST removal and backfilling.

3.05 DECONTAMINATION

- A. All equipment shall be decontaminated prior to delivery to the site.
- B. Heavy equipment contaminated during the performance of the work shall be decontaminated on a schedule compatible with site operations and in no case later than the end of the same working day.
1. Equipment may not be removed from the work area to other areas of the project site until it has been adequately decontaminated.
 2. Decontamination procedures may include powerwashing equipment, manual removal of contaminated media, or other methods as appropriate.
 3. Contractor shall containerize decontamination rinsate for off-site disposal.
- C. Contractor shall manage soiled personnel protective equipment at his sole expense.

3.06 ENVIRONMENTAL CHARACTERIZATION AND QUALITY CONTROL

- A. Activities required by the MassDEP UST closure guidance, including soil screening and sample collection will be conducted by the Engineer. Upon removal of the UST, the Contractor will assist the Engineer as needed in the collection of soil samples from the sidewalls and base of the excavation for characterization and documentation of post-excavation conditions.
- B. Engineer may collect random or biased samples of decontamination soils and fluids, or wipe surfaces to ensure that proper decontamination procedures are being followed. If decontamination is determined by the Engineer to be ineffective or insufficient, undertake additional decontamination measures necessary to provide an adequate level of decontamination.

3.07 CONTAMINATED SOIL MANAGEMENT (IF NECESSARY)

- A. If, during or after removal of the tank and/or appurtenances, the Contractor locates material that is believed to be contaminated or hazardous, the Contractor shall cease work and notify the Owner and Architect. The Owner and Architect will coordinate the regulatory response, if warranted.
 - 1. The Contractor shall excavate and manage soil at the direction of the Engineer. The Contractor should note that there may be a delay of a number of days to facilitate the characterization of soil in the excavation area prior to restarting work.
 - 2. The Contractor shall be prepared to segregate soil for disposal or reuse based on its environmental quality, as directed by the Engineer. Engineer will field-screen soil to evaluate the presence of petroleum contamination and to separate contaminated soil.
- B. Construct a soil stockpile containment system for contaminated or suspect soil, to prevent seepage, runoff, or siltation.
 - 1. Lay down polyethylene sheeting of sufficient size for contaminated soil stockpile, perimeter erosion controls, and granular absorbent outer ring.
 - 2. Install erosion controls along entire perimeter of stockpile, in accordance with manufacturer's recommendations and local, state and federal regulations.
 - 3. When excavation is ongoing, occasionally mist contaminated stockpile with water during windy or dry conditions.
 - 4. Cover stockpile with polyethylene sheeting, surround with sorbent materials to contain material and to prevent infiltration of the elements. Secure in place with weights.

5. Maintain stockpile and containment system. Inspect daily for damage and signs of leakage. Immediately replace damaged materials.
- C. All work associated with the loading, removal, transport and disposal of contaminated material, shall be in accordance with the specifications and local, state, and federal regulations. Payment for such work shall be based upon unit prices.
- D. If the tank and/or associated piping are removed prior to the removal of all liquid, or if incidental spills occur during the work, the resulting spill/release shall be the responsibility of the Contractor. All media contaminated by this release shall be tested, excavated, removed and disposed of at the Contractor's sole expense, including regulatory notification, coordination, and reporting, as needed. Removal of all contaminated materials shall be accomplished in strict accordance with these specifications and local, state, and federal regulations.

3.08 CONTAMINATED GROUNDWATER MANAGEMENT (IF REQUIRED)

- A. The Contractor shall notify the Owner and Engineer if free floating product (petroleum) is observed on the surface of the water table within the UST grave following removal. Skimming and/or pumping of the free product shall be conducted until all free product is captured or as directed by the Engineer.
- B. Groundwater and free floating product collected by the Contractor shall be managed in accordance with State and Federal Regulations.

3.09 MATERIAL DISPOSAL

- A. The Contractor shall properly dispose of all containers of liquids, residuals, contaminated groundwater, and/or regulated soil generated from UST cleaning, spill containment, solid waste, asphalt, concrete, and PPE produced during the removal of the tank.
- B. The Contractor shall be responsible for preparation of all required waste manifests including but not limited to hazardous waste manifests, material shipping records, and bills of lading necessary for the transport and disposal of materials generated during the UST removal. The Contractor shall provide the Owner and Engineer 48-hour notice for review and execution as generator for waste shipping documents.
- C. The Owner shall be notified at least 24 hours in advance of transporting waste liquids from the Site. The Owner shall be notified at least 24 hours prior to the removal and off-site disposal of contaminated soil. The Owner shall sign the shipping documents for each load removed from the Site.

- D. The Contractor is responsible for the lawful transportation and disposal of the waste materials.

PART 4 - MEASUREMENT AND PAYMENT

4.01 Lump Sum Base Bid Item: UST Removal and Disposal

- A. The lump sum base bid for this section includes all materials, equipment, labor, permitting, and ancillary conditions associated with exposure, cleaning, removal, and lawful disposal of a 10,000 gallon heating oil UST. Said price includes cleaning, removal and disposal of appurtenances and tie-down structures, and approximately 3,500 gallons of liquid waste, and the importation and placement of backfill material in accordance with the related project specifications. If necessary for the performance of the work, said price includes protection of any structures or underground utilities affected by the work.
- B. Excavation required to expose and remove the UST and to facilitate the collection of soil samples for the Engineer's closure documentation shall be considered incidental to this bid item. Additional excavation required to manage and dispose of petroleum-contaminated soil is not included in this bid item.
- C. This work will not be measured for payment. However, the work will be observed by the Owner and Engineer, and payment will be contingent upon confirmation of adequate performance of the scope of work.

4.02 Unit Bid Item: Contaminated Soil Management

- A. Excavation and off-site disposal of contaminated soil will only be paid if explicitly directed by the Owner or Engineer.
- B. This unit item includes, but is not limited to: Excavation, staging, handling, management of stockpiled media, loading, characterization (including laboratory analysis, as required), transporting and disposing of contaminated material from the site to approved treatment/disposal facilities, backfilling of the compensatory volume, preparation of manifests or bills of lading, fees paid, and incidental materials, tools, equipment, and services.
- C. This item will be measured and paid in TONS of material delivered to treatment/disposal facilities, as measured by the permanent scales at the respective facilities and documented in certified weight slips submitted to the Owner and Engineer. Total weight will be the summation of weight bills issued by such facilities. No "minimum quantity" tonnage billing will be accepted for this item.

4.03 Unit Bid Item: Contaminated Groundwater Management

- A. Removal and off-site disposal of contaminated groundwater and light non-aqueous phase liquids (NAPL) will only be paid if explicitly directed by the Owner or Engineer.
- B. Includes, but is not limited to: Vacuuming accessible groundwater and petroleum liquid from the excavation grave, handling, loading, transport and disposal at approved treatment/disposal facilities, characterization (including laboratory analysis, as required), preparation of manifests or bills of lading, fees paid, and incidental materials, tools, equipment, and services.
- C. This item will be measured and paid in GALLONS of waste liquid delivered to treatment/disposal facilities, as measured by the respective facilities and documented in certified receipts submitted to the Owner and Engineer. Total volume will be the summation of receipts issued by such facilities. No “minimum quantity” volume billing will be accepted for this item.

END OF SECTION

DEMOLITION OF FORMER OSTERVILLE
BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER GYM
HYANNIS, MASSACHUSETTS
CBI JOB NO.: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
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SECTION 02 82 00

HAZARDOUS MATERIALS REPORT

FUSS & O'NEILL ENVIRO SCIENCE, LLC
2014 REPORT & 2017 SUPPLEMENTARY
REPORT

Hazardous Building Materials Inspection

**Former West Bay Elementary School &
Osterville Community Center
99 West Bay Road
Osterville, Massachusetts
May 30, 2014 – June 3, 2014 & July 25, 2014**

Town of Barnstable

Barnstable, MA

August 12, 2014



FUSS & O'NEILL
EnviroScience, LLC

Fuss & O'Neill EnviroScience, LLC
50 Redfield Street, Suite 100
Boston, Massachusetts 02122



August 12, 2014

Mr. Mark Marinaccio
Building Design Architect
Town of Barnstable
Department of Public Works
800 Pitchers Way
Hyannis, MA 02601

**RE: Hazardous Building Materials Inspection
Former West Bay Elementary School and Osterville Community Center
99 West Bay Road in Osterville, MA**

Fuss & O'Neill EnviroScience, LLC No. 20140444.A1E

Dear Mr. Marinaccio:

Enclosed is the hazardous building materials inspection summary report for the former West Bay Elementary School and Osterville Community Center located at 99 West Bay Road in Osterville, Massachusetts.

From May 31, 2014 to June 3, 2014 and July 25, 2014, Fuss & O'Neill EnviroScience, LLC (EnviroScience) Commonwealth of Massachusetts-certified Asbestos Inspectors performed an asbestos inspection, a lead-based paint screening, a waste characterization for mercury, and a fluorescent light ballast and mercury-containing equipment inventory prior to proposed renovation of Site buildings.

The information summarized in this report is solely for the abovementioned materials. The work was performed in accordance with our written scope of services dated May 21, 2014.

If you have any questions regarding the contents of this report, please do not hesitate to contact me at 617-282-4375, extension 4703. Thank you for this opportunity to have served your environmental needs.

Sincerely,

A handwritten signature in black ink that reads 'D. A. DIEDRICKSEN'.

Dustin A. Diedricksen
Project Manager

50 Redfield Street

Suite 100

Boston, MA

02122

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DAD/ftc

Enclosure

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1 Introduction

From May 31, 2014 to June 3, 2014 and July 25, 2014, Fuss & O'Neill EnviroScience, LLC (EnviroScience) representatives, Mr. Jonathan Hand and Mr. Chris McIntyre, performed a hazardous building materials inspection prior to renovation at the former West Bay Elementary School and Osterville Community Center both located at 99 West Bay Road in Osterville, Massachusetts (the "Site"). Refer to *Appendix A* for a copy of each Asbestos Inspector's Commonwealth of Massachusetts certification.

The work was performed for the Town of Barnstable (the "Client") in accordance with our written scope of services dated May 21, 2014. The scope of work included the following:

- Asbestos-Containing Materials (ACM) inspection;
- Lead-Based Paint (LBP) determination;
- Mercury Waste Characterization; and
- Inventory of fluorescent light ballasts and mercury-containing equipment.

The former West Bay Elementary School was reportedly constructed in 1915. The former school and community center cumulatively contain approximately 23,700 square feet (SF) of total floor space. The inspection was limited to the two identified building structures listed below. The identification of material is based on individual homogenous sampling groups, which were separated by building age and construction type as follows:

- Former West Bay Elementary School (18,700 SF two-story structure built in 1915)
- Osterville Community Center (5,000 SF single-story recreational building built at a later unknown date)

2 Asbestos Inspection

A property owner must ensure that a thorough ACM inspection is performed prior to possible disturbance of suspect ACM during renovation or demolition activities. This is a requirement of the United States Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation located at Title 40 CFR, Part 61, Subpart M.

2.1 Methodology

The inspection was conducted by visually inspecting for suspect ACM and touching each of the suspect materials. The suspect materials were categorized into three groups EPA NESHAP groups: friable and non-friable Category I and Category II type ACM.

- A Friable Material is defined as material that contains greater than 1 percent asbestos, that when dry **can** be crumbled, pulverized, or reduced to powder by hand pressure.
- A Category I Non-Friable Material refers to material that contains greater than 1 percent asbestos (i.e., packings, gaskets, resilient floor coverings, and asphalt roofing products) that when dry **cannot** be crumbled, pulverized, or reduced to powder by hand pressure.

- A Category II Non-Friable Material refers to any non-friable material excluding Category I materials that contain greater than 1 percent asbestos that when dry **cannot** be crumbled, pulverized, or reduced to powder by hand pressure.

The Massachusetts Department of Environmental Protection (MassDEP) further defines an ACM as any material containing equal to or greater than 1 percent ($\geq 1\%$) asbestos to be an ACM.

The suspect ACMs were also categorized into their applications including, Thermal System Insulation (TSI), Surfacing ACM, and Miscellaneous ACM. TSI includes those materials used to prevent heat loss/gain or water condensation on mechanical systems. Examples of TSI are pipe insulation, boiler insulation, duct insulation, and mudded pipe fitting insulations. Surfacing ACM includes those ACM that are applied by spray, trowel, or otherwise applied to an existing surface. Surfacing ACM is commonly used for fireproofing, decorative, and acoustical applications. Miscellaneous materials include those ACM not listed as thermal or surfacing, such as linoleum, vinyl asbestos flooring, ceiling tiles, caulks, glues, construction adhesives, etc.

The EPA recommends collecting suspect ACM samples in a manner sufficient to determine asbestos content and to segregate each suspect type of homogenous (similar in color, texture, and date of application) materials. The EPA NESHAP regulation does not specifically identify a minimum number of samples to be collected for each homogeneous material (HM), but the NESHAP regulation does recommend the use of sampling protocols included in Title 40 CFR, Part 763, Subpart E: Asbestos Hazard Emergency Response Act (AHERA).

The EPA AHERA regulation requires a specific number of samples be collected based on the type of material and quantity present. This regulation includes the following protocol:

1. Surfacing Materials (i.e., plasters, spray-applied fireproofings, etc.) must be collected in a randomly distributed manner representing each homogenous area based on the overall quantity represented by the sampling as follows:
 - a. Three (3) samples collected from each homogenous area that is less than or equal to 1,000 square feet.
 - b. Five (5) samples collected from each homogenous area that is greater than 1,000 square feet but less than or equal to 5,000 square feet.
 - c. Seven (7) samples collected from each homogenous area that is greater than 5,000 square feet.
2. Thermal System Insulation (i.e., pipe insulations, tank insulations, etc.) must be collected in a randomly distributed manner representing each homogenous area. Three (3) samples must be collected from each material. Also, a minimum of one (1) sample of any patching materials applied to TSI presuming the patched area is less than 6 linear or square feet should be collected.
3. Miscellaneous materials (i.e., floor tile, gaskets, construction mastics, etc.) should have a minimum of two (2) samples collected for each type of homogenous material. Sample collection was conducted in a manner sufficient to determine asbestos content of the homogenous material as determined by the inspector.

The inspectors collected samples of suspect ACM, and prepared proper chain of custody forms for transmission of the samples collected to EMSL Analytical Inc. (EMSL) for analysis. EMSL is a Commonwealth of Massachusetts-licensed and American Industrial Hygiene Association (AIHA)-accredited asbestos analytical laboratory. The sample locations, material type, sample identification, and asbestos content are identified by bulk sample analysis in **Tables 1 and 2** in the following Section. Suspect ACM not listed in the following tables that are identified at the Site, should be assumed to be ACM until sample collection and analysis indicate otherwise. Initial asbestos sample analysis was conducted using the EPA Interim Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116) via Polarized Light Microscopy with Dispersion Staining (PLM/DS).

2.2 Results

Analytical results of bulk samples indicate that the following materials contain asbestos at greater than 1%:

Table 1
Identified ACM

Homogenous Locations	Material Type	Sample Number	Asbestos Content	Estimated Quantity
Osterville Community Center				
Entry	Brown Interior/Exterior Window Wall Caulking	0530JH-12A	2% Chrysotile	75 LF
Exterior	Brown Vertical Exterior Expansion Joint Caulking	0530JH-18B	2% Chrysotile	150 LF
Throughout Interior	Brown Vertical Interior Expansion Joint Caulking	0530JH-19A	2% Chrysotile	150 LF
Game Room	Pink Sink Undercoating	0530JH-22A	5% Chrysotile	1 EA
Exterior Subgrade Foundation	Black Damp-Proofing	0530JH-26A	9% Chrysotile	550 SF
Exterior	Black Through-Wall Flashing	0530JH-27A	10% Chrysotile	400 SF
Entry	Black Window Glazing Compound Associated with Interior Windows	0530JH-28A	6% Chrysotile	2 EA @ 2' x 8' 2 EA @ 5' x 4'
Former West Bay Elementary School				
Roof	Red/Brown Slater's Mud	0602JH-03A	8% Chrysotile	8,350 SF

Homogenous Locations	Material Type	Sample Number	Asbestos Content	Estimated Quantity
Exterior	Exterior White Window Caulking Associated with Aluminum Windows & White Concealed Older Window Caulking (beneath Aluminum Frame)	0602JH-04A & 0602JH-07A	5% Chrysotile & 1.25% Chrysotile	7 EA @ 5' x 5' 10 EA @ 3' x 5' 9 EA @ 5' x 3' 9 EA @ 5' x 6' 3 EA @ 4' x 9' 11 EA @ 5' x 8' 4 EA @ 20' x 8' 3 EA @ 3' x 6' 1 EA @ 2' x 4' 2 EA @ 6' x 8' 5 EA @ 15' x 8'
Exterior	Brown Interior/Exterior Door Caulking	0602JH-05A	6% Chrysotile	325 LF
Exterior (Outside Boiler Room)	Residual Black Caulking	0602JH-08A	15% Chrysotile	40 LF
Rooms 1 – 3, Room 6, Cafeteria, & Kitchen	Dark Brown Glue Daubs Associated with 1' x 1' Dot Pattern Ceiling Tile (Note: 1' x 1' Ceiling Tiles are to be Considered Contaminated)	0602JH-10A	2.50% Chrysotile	4,500 SF
Rooms 1 – 3, Room 6, Cafeteria, & Kitchen	2' x 4' Suspended Ceiling Tile (Note: Contaminated by damage to Dark Brown Glue Daubs Associated with 1' x 1' Dot Pattern Ceiling Tile)	Contaminated	Contaminated	4,500 SF
Rooms 2 - 7, Rooms 9 - 14, Rooms 16 - 18, Cafeteria, & Kitchen	Corrugated Paper-Type Pipe Insulation	0602JH-20A	40% Chrysotile	625 LF
	Hard-Packed Pipe Fitting Insulation	0602JH-21A	60% Chrysotile	
	Pre-Formed Block Type Pipe Insulation	0602JH-32A	10% Amosite 60% Chrysotile	
Room 14 Boiler Room	Gray Flue Patching Compound	0602JH-33A	5% Amosite 5% Chrysotile	6 SF
Classrooms	Black Speaker Box Mastic	0602JH-36A	6% Chrysotile	25 EA @ 3 SF

Homogenous Locations	Material Type	Sample Number	Asbestos Content	Estimated Quantity
Room 22	Gray Window Glazing Compound Associated with Interior Window Wall	0602JH-38A	2.25% Chrysotile	2 EA @ 4' x 8' 2 EA @ 10' x 8'
Room 38	White Sink Undercoating	0602JH-45A	1.50% Chrysotile	1 EA

Analytical results of bulk samples indicate that the following materials are non-ACM:

Table 2
Non Asbestos-Containing Materials

Sample Locations	Material Type	Sample Number
Osterville Community Center		
Entry; Men's Bathroom	Tan Granular Pattern Linoleum Flooring	0530JH-01A, 01B
Entry; Men's Bathroom	Tan Mastic Associated with Tan Granular Pattern Linoleum Flooring	0530JH-02A, 02B
Game Room	12" x 12" White with Black Splotch Floor Tile	0530JH-03A, 03B
Game Room	Mastic Associated with 12" x 12" White with Black Splotch Floor Tile	0530JH-04A, 04B
Men's Bathroom; Game Room	4" Brown Vinyl Base Board	0530JH-05A, 05B
Men's Bathroom; Game Room	Tan Mastic Associated with 4" Brown Vinyl Base Board	0530JH-06A, 06B
Game Room Closet	Pink Drywall	0530JH-07A, 07B & 07C
Game Room Closet	White Joint Compound	0530JH-08A, 08B & 08C
Game Room; Gym	White Interior Door Caulking	0530JH-09A, 09B
Game Room	2' x 4' White Pin/Fissure Suspended Ceiling Tile	0530JH-10A, 10B
Entry; Men's Bathroom	2' x 4' Sand Texture Suspended Ceiling Tile	0530JH-11A, 11B
Office	4" Gray Vinyl Base Board	0530JH-13A, 13B
Office	Light Brown Carpet Adhesive	0530JH-14A, 14B
Gym	Tan Adhesive Associated with Rubber Gym Floor	0530JH-15A, 15B
Exterior Door B & C Sides	Gray Lintel Caulking	0530JH-16A, 16B
Exterior West & South	Gray Expansion Joint Caulking	0530JH-17A, 17B

Sample Locations	Material Type	Sample Number
Gym	Gray Penetration Sealant Associated with Duct Work	0530JH-20A, 20B
Game Room; Gym	White Paper Associated with Fiberglass Pipe Insulation	0530JH-21A, 21B
Men's Bathroom	Brown Paper-Type Stall Partition Insulation	0530JH-23A, 23B
Exterior North& East	Gray Exterior Door Caulking	0530JH-24A, 24B
Exterior	Red Exterior Foundation Parging Cement	0530JH-25A, 25B & 25C
Entry; Game Room	White Window Caulking Associated with Interior Windows	0530JH-29A, 29B
Entry	Silver Paper Associated with Heater	0530JH-30A, 30B
Roof	Black Lap Seam Sealant	01A & 01B-JH-725
Former West Bay Elementary School		
Exterior Portico Roof	Blue/Gray Asphalt Shingle	0602JH-01A, 01B
Exterior Portico Roof	Black Roofing Paper	0602JH-02A, 02B
Exterior North & South	White Louver Caulking	0602JH-06A, 06B
Cafeteria; Kitchen	1' x 1' Dot Pattern Ceiling Tiles*	0602JH-09A, 09B
Cafeteria	White 3' x 5' Pinhole Acoustic Wall Panel	0602JH-11A, 11B
Cafeteria	Light Brown Glue Daubs Associated with White 3' x 5' Pinhole Acoustic Wall Panel	0602JH-12A, 12B
Cafeteria; Room 21	2' x 4' Fissure & Dot Suspended Ceiling Tile*	0602JH-13A, 13B
Rooms 2 & 33	Brown Glue Daubs Associated with Chalk Board	0602JH-14A, 14B
Rooms 2 & 17	4" Brown Vinyl Baseboard	0602JH-15A, 15B
Rooms 2 & 17	Dark Brown Adhesive Associated with 4" Brown Vinyl Baseboard	0602JH-16A, 16B
Cafeteria, Room 21	12" x 12" Tan Mottled Floor Tile	0602JH-17A, 17B
Cafeteria; Room 11	12" x 12" Light Brown Mottled Floor Tile	0602JH-18A, 18B
Cafeteria; Rooms 11 & 21	Black Mastic Associated with 12" x 12" Floor Tiles	0602JH-19A, 19B & 19C
Cafeteria	Black Wall Panel Adhesive	0602JH-22A, 22B
Rooms 2 & 17	12" x 12" Pink Mottled Floor Tile	0602JH-23A, 23B
Rooms 1 & 8	Yellow Stair Tread Mastic	0602JH-24A, 24B

Sample Locations	Material Type	Sample Number
Rooms 4 & 11	Black Sink Undercoating	0602JH-25A, 25B
Room 11	12" x 12" White with Light Blue Splotches Floor Tile	0602JH-26A, 26B
Rooms 11 & 16	Yellow Mastic Associated with 12" x 12" Floor Tile	0602JH-27A, 27B
Room 11	Dark Gray Floor Leveling Compound	0602JH-28A, 28B
Room 11	Off-White Square Pattern Linoleum Flooring	0602JH-29A, 29B
Room 11	White Adhesive Associated with Off-White Square Pattern Linoleum Flooring	0602JH-30A, 30B
Rooms 12 & 22	White Interior Door Caulking	0602JH-31A, 31B
Room 14 Boiler Room	Gray Duct Seam Sealant	0602JH-34A, 34B
Room 14 Boiler Room	White Pipe Thread Sealant	0602JH-35A, 35B
Room 14 Boiler Room	Boiler Ribbing Rope Gasket	0602JH-37A, 37B & 37C
Rooms 21 & 33	Yellow Carpet Glue	0602JH-39A, 39B
Room 33	Dark Brown Chalk Board Shim Glue	0602JH-40A, 40B
Rooms 32 & 30	Gray Ceramic Wall Tile Grout	0602JH-41A, 41B
Rooms 32 & 30	Gray Ceramic Wall Tile Adhesive	0602JH-42A, 42B
Rooms 32 & 30	White Sink Caulking	0602JH-43A, 43B
Rooms 32 & 30	Gray Ceramic Floor Tile Mud Set	0602JH-44A, 44B
Exterior	Black Roof Felt Paper Associated with Slate Roofing	0602JH-46A, 46B
Room 39	Yellow Rectangle Pattern Linoleum Flooring	0602JH-47A
Room 39	Yellow Rectangle Pattern Linoleum Flooring	0602JH-47B
Room 39	Gray Mastic Associated with Yellow Rectangle Pattern Linoleum Flooring	0602JH-48A
Room 39	Gray Mastic Associated with Yellow Rectangle Pattern Linoleum Flooring	0602JH-48B
Attic	Residual Black Built-Up Roofing	0602JH-49A
Attic	Residual Black Built-Up Roofing	0602JH-49B
Attic	Brown Roof Paper Associated with Residual Built-Up Roofing	0602JH-50A
Attic	Brown Roof Paper Associated with Residual Built-Up Roofing	0602JH-50B

Sample Locations	Material Type	Sample Number
Attic	Residual Black & Gold Asphalt Shingles	0602JH-51A
Attic	Residual Black & Gold Asphalt Shingles	0602JH-51B
Room 2; Cafeteria; Room 21	Gray Drywall	0602JH-52A, 052B, & 052C
Rooms 2, 17 & 21	White Joint Compound	0602JH-53A, 053B & 053C
Cafeteria, Room 2; Room 17; Room 38; Room 24; Room 36; Room 23	Gray Plaster Rough Coat	0602JH-54A - G
Cafeteria, Room 2; Room 17; Room 38; Room 24; Room 36; Room 23	White Plaster Skim Coat	0602JH-55A - G
Roof	Black Lap Seam Sealant	02A & 02B-JH-725

*Material type to be removed and disposed as asbestos-contaminated material

The EPA, Occupational Safety and Health Administration (OSHA), and the Commonwealth of Massachusetts Department of Labor Standards (MADLS) defines any material that contains greater than one percent (> 1%) asbestos, utilizing PLM, as being an ACM. The MassDEP defines any material that contain equal to or greater than one percent ($\geq 1\%$) asbestos as being an ACM. Materials that are identified as "none detected" are specified as not containing asbestos.

Additionally, the EPA has suggested that non-friable organically bound materials (e.g., asphaltic-based materials, adhesives, caulks, etc.) be further analyzed utilizing Transmission Electron Microscopy (TEM). None of the samples collected during this inspection were analyzed by TEM. Suspect ACM not identified during this inspection should be presumed to contain asbestos until sample collection and laboratory analysis indicate otherwise.

Refer to *Appendix B* for the asbestos laboratory analytical reports and chain of custody forms.

2.3 Conclusions and Recommendations

EnviroScience recommends a supplemental destructive investigation inspection be conducted prior to disturbance of hidden and inaccessible spaces if they may be impacted by future renovation or demolition activities.

Prior to disturbance, ACM that would likely be impacted by the renovation or demolition work must first be abated by a Commonwealth of Massachusetts-licensed Asbestos Abatement Contractor. This is a requirement of MADLS, MassDEP, EPA NESHAP, and AHERA regulations that govern asbestos abatement.

EnviroScience recommends that if any ACMs are to remain in the building, the ACM should be managed in-place under a written Operations and Maintenance Program.

Due to the inability to effectively separate some types of multi-layered ACMs (i.e., floor tile/mastic, gypsum board/joint compound, mastic/plywood, etc.) from non-ACMs, these non-ACM are considered asbestos-contaminated for the purposes of removal and disposal, and should also be managed as ACM (e.g., floor tile and mastic, two layers of floor tile, sheetrock and joint compound, etc.).

If suspect materials should be encountered during renovation/demolition activities that are not identified in this report as being non-ACM, they should be assumed to be ACM unless sample collection and analysis indicate otherwise.

This report is not intended to be utilized as a bidding document or as a project specification document for asbestos abatement. The report is designed to aid the building owner, architect, construction manager, general contractors, and asbestos abatement contractors in locating ACM. Quantities and locations of identified ACMs should be confirmed and observed by the prospective asbestos abatement contractors during the bidding process.

3 Lead-Based Paint Screening

From May 31, 2014 to June 3, 2014, Mr. Jonathan Hand and Mr. Chris McIntyre of EnviroScience performed an LBP screening associated with painted building components at the Site. An X-ray fluorescence (XRF) spectrum analyzer was used to perform the LBP screening. The screening was conducted in accordance with generally-accepted industry standards for non-residential (i.e., not child-occupied) buildings.

3.1 Methodology

A Radiation Monitoring Device Model LPA-1 (Serial Number 1395) was utilized for the LBP screening. The instrument was calibrated according to the manufacturer's Performance Characteristic Sheet (PCS) prior to each use.

For the purpose of this LBP screening, representative building components were tested for lead-based paint. Individual repainting efforts are not always discoverable in such a limited program. LBP issues involving properties that are not residential are only regulated to a limited degree for worker protection relating to paint-disturbing work activities and waste disposal.

Worker protection is regulated by OSHA regulations, as well as MADLS regulations. These regulations involve air monitoring of workers to determine exposure levels when disturbing lead-containing paint (LCP). An LBP screening cannot determine a safe level of lead, but is intended to provide guidance for implementing industry standards for lead in paint at identified locations. Contractors may better determine worker exposure to airborne lead by understanding the different concentrations of LBP on representative building components and surfaces. Air monitoring can then be performed during activities that disturb paint on representative surfaces.

The EPA Resource Conservation and Recovery Act (RCRA) and MassDEP regulate lead-containing waste disposal. Representative samples of waste materials containing lead that will be impacted during renovation or demolition and result in waste for disposal must be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP), if lead is determined to be present in non-residential buildings. A TCLP sample is a representative sample of the intended waste stream. The results are compared to a threshold value of 5.0 milligrams per liter (mg/L). If TCLP sample analytical results exceed this value, the waste is considered hazardous lead waste. If the result is below the established level, the waste material is not considered hazardous and may be disposed as normal construction and demolition debris.

A level of LBP exceeding 1.0 milligrams of lead per square centimeter (mg/cm²) of surface area is considered toxic or dangerous by EPA and the Massachusetts Department of Public Health (MADPH) residential standards. For purpose of this screening, the level of 1.0 mg/cm² has been utilized as a threshold for areas where possible worker exposures may occur.

3.2 XRF Screening Results

The LBP determination indicated consistent painting trends associated with representative areas screened. Painted building components were determined to contain dangerous levels of lead (> 1.0 mg/cm²) in the former West Bay Elementary School including the following:

Table 3
Positive Lead-Based Paint XRF Screening Results
Former West Bay Elementary School

Location	Building Component	Color	Substrate	Result (mg/cm ²)
Room 17	Door Frame	Brown	Metal	1.0
Room 17	Wall	White	Plaster	1.0
Boiler Room	Window Frame	White	Wood	3.6 – 5.0
Room 15	Stall Door	White	Wood	1.0
Room 21	Window Frame	White	Wood	1.2

See *Appendix C* for the complete lead screening field data sheets.

OSHA published a Lead in Construction Standard (OSHA Lead Standard) Title 29 CFR, Part 1926.62 in May of 1993. The OSHA Lead Standard set no limits for the content of lead in paint below which the standards do not apply. The OSHA Lead Standards are task-based, and are also based on airborne exposures and blood lead levels.

The results of this LBP screening are intended to provide guidance to contractors for occupational lead exposure controls. Building components containing lead levels above industry standards may cause exposures to lead above OSHA permissible exposure limits during proposed demolition and renovation

activities. The results of this screening are also intended to provide insight into waste disposal requirements, in accordance with EPA RCRA regulations.

3.3 Conclusions and Recommendations

LBP was identified on building components located on and in the building. If LBP-coated building components will be disturbed by renovation or demolition activities, sample collection of representative waste stream should be analyzed for total lead by TCLP to determine a proper waste management facility for disposal. If disturbed and managed off-site, non-porous LBP-coated building materials (i.e., metals) may be segregated and recycled as scrap metal. Grinding, sawing, drilling, sanding, or torch cutting LBP-coated building components is prohibited.

Note that the information contained in this report concerning the presence or absence of lead in paint, does not constitute a comprehensive lead inspection in accordance with MADPH regulations (105 CMR 460.000). The screened painted surfaces represent only a portion of those surfaces that would be screened to determine whether the premises are in compliance with the aforementioned regulations, which are specific to a child-occupied residence only, and not applicable to a building of this type and use.

4 Mercury Waste Characterization

A waste is a solid or liquid material that serves no further purpose. A waste is defined by EPA to be hazardous if it contains certain properties that could pose dangers to human health and the environment after it is discarded. Wastes that are ignitable, corrosive, reactive, or toxic are regulated under the Hazardous Waste Regulations. TCLP is an analytical method that extracts the compounds of interest in a standard way simulating landfill conditions (EPA Title 40 CFR, Part 261).

4.1 Methodology

Mr. Jonathan Hand collected representative aliquots of the Osterville Community Center's Gym flooring material. Mercury was used as a catalyst (up to 0.2% by weight) in the curing process for some synthetic gym floors manufactured from the 1960's until the mid-1990's. These floors give off mercury vapor continuously. The mercury vapors can accumulate to relatively high levels in poorly ventilated spaces, even in large spaces such as gyms. Increases in mercury vapor to levels of health concern, is especially problematic in the summer because higher temperatures increase the amount of mercury off-gassing from the flooring material. The samples were analyzed by TCLP for mercury as a representation of the total waste stream, should the flooring be demolished.

EMSL, Inc. (EMSL) of Cinnaminson, New Jersey analyzed the samples. EMSL is a Commonwealth of Massachusetts-certified laboratory. The samples were analyzed using EPA Method SW-846 (Extraction Method 1311).

4.2 Results

In total, three samples of the gym flooring materials were collected and analyzed. EPA RCRA defines toxic concentrations for mercury to be greater than 0.2 mg/L, or parts per million (ppm).

Table 4
Mercury TCLP Waste Characterization Results

Location	Sample Number	Mercury Content (mg/L)
Osterville Community Center Gym Flooring	602JH-TCLP-01	< 0.0020
Osterville Community Center Gym Flooring	602JH-TCLP-02	< 0.0020
Osterville Community Center Gym Flooring	602JH-TCLP-03	< 0.0020

The analytical results of the representative samples indicate the waste leaches mercury at less than 0.0020 mg/L and is therefore, not classified as a hazardous waste. Refer to *Appendix D* for the EMSL laboratory report.

4.3 Conclusions

Based on the TCLP laboratory analytical results of the representative gym flooring material waste stream samples, if the gym flooring material is demolished, the waste generated would not be classified as a hazardous waste by the EPA.

5 Fluorescent Light Ballasts and Mercury-Containing Equipment

5.1 Fluorescent Light Ballasts

Fluorescent light ballasts manufactured prior to 1979 may contain capacitors that contain PCBs. Ballasts installed as late as 1985 may contain PCB capacitors. Fluorescent light ballasts that are not labeled as "No PCBs" must be assumed to contain PCBs unless proven otherwise by quantitative analysis.

Capacitors in fluorescent light ballasts labeled as non-PCB-containing may contain diethylhexyl phthalate (DEHP). DEHP was the primary substitute to replace PCBs for small capacitors in fluorescent lighting ballasts in use until 1991. DEHP is a toxic substance, a suspected carcinogen, and is listed under RCRA and the Superfund law as a hazardous waste. Therefore, Superfund liability exists for a building owner or operator when landfilling both PCB and DEHP-containing light ballasts. These listed materials are considered hazardous waste under RCRA, and require special handling and disposal considerations.

Between May 30, 2014 and June 3, 2014, Mr. Jonathan Hand and Mr. Chris McIntyre of EnviroScience performed a visual inspection of representative fluorescent light fixtures to identify possible PCB-containing light ballasts. The inspection involved visually inspecting labels on representative light

ballasts to identify dates of manufacture and labels indicating “No PCBs”. Ballasts manufactured after 1991 were not listed as PCB or DEHP-containing ballasts, and were not quantified for disposal. Refer to **Table 5** below for an inventory of fluorescent light ballasts.

Table 5
Inventory of Fluorescent Light Ballasts

Type	Estimated Quantity
Osterville Community Center	
DEHP Ballasts	28
PCB Ballasts	0
Former West Bay Elementary School	
DEHP Ballasts	416
PCB Ballasts	58
TOTAL	502

Light ballasts without a label indicating “No PCBs” are presumed to be PCB waste and must be segregated for proper removal, packaging, transport, and disposal as PCB waste. Ballasts marked as “No PCBs” with date labels indicating manufacture prior to 1991 are presumed to contain DEHP. DEHP-containing ballasts must be segregated for proper removing, packaging, transporting, and disposing as non-PCB hazardous waste. Note that disposal requirements for DEHP-containing ballasts are slightly varied, and disposal costs are slightly less than PCB-containing light ballasts.

5.2 Mercury-Containing Equipment

Fluorescent lamps/tubes are presumed to contain mercury vapor, which is a hazardous substance to both human health and the environment. Thermostatic controls and electrical switch gear may contain a vial or bulb of liquid mercury associated with the device.

Between May 30, 2014 and June 3, 2014, Mr. Jonathan Hand and Mr. Chris McIntyre of EnviroScience inventoried the in-place light fixtures and other mercury-containing equipment. Refer to **Table 6** below for a complete inventory of mercury-containing equipment identified.

Table 6
Inventory of Mercury-Containing Equipment

Type	Estimated Quantity
Osterville Community Center	
4' Bulbs	52
2' Bulbs	8
CFL's	8
Former West Bay Elementary School	
4' Bulbs	612
2' “U” Shaped Bulbs	40

5.3 Conclusions and Recommendations

Light ballasts without a label indicating “No PCBs” are presumed to be PCB waste and must be segregated for proper removal, packaging, transport, and disposal as PCB waste. Ballasts marked as “No PCBs” with date labels indicating manufacture prior to 1991 are presumed to contain DEHP. DEHP-containing ballasts must be segregated for proper removing, packaging, transporting, and disposing as non-PCB hazardous waste. Note that disposal requirements for DEHP-containing ballasts are slightly varied, and disposal costs are slightly less than PCB-containing light ballasts.

Mercury-containing equipment is regulated for proper disposal by the EPA RCRA regulations. According to the EPA, mercury lamps/tubes are characterized as a Universal Waste. All fluorescent lamps/tubes must either be recycled, or disposed as hazardous waste.

Report prepared by Senior Environmental Technician, Jonathan Hand.

Reviewed by:



Dustin A. Diedricksen
Project Manager



Timothy M. Downey
Senior Project Manager

Appendix A

EnviroScience Asbestos Inspector State Certifications and Accreditations

Commonwealth of Massachusetts
Department of Labor Standards

Heather E. Rowe, Director

Asbestos Inspector



CHRISTOPHER MCINTYRE

Eff. Date 07/24/14

Exp. Date 07/24/15

A1900564

Member of CONES

NBN

NB-NEW

15





This is to certify that

Christopher McIntyre

has completed the requisite training, and has passed an examination for accreditation

as:

Asbestos Inspector

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

Course Location
Institute for Environmental Education, Inc.
16 Upton Drive Wilmington, MA 01887

May 19-21, 2014

Course Dates

14-8950-102-260155

Certificate Number

May 21, 2014

Examination Date

May 21, 2015

Expiration Date

Training Director

16 Upton Drive Wilmington, MA 01887 Telephone: 978-658-8872 www.iefed.org

INSTITUTE FOR ENVIRONMENTAL EDUCATION

Commonwealth of Massachusetts
Department of Labor Standards

Heather E. Rowe, Director

Asbestos Inspector



JONATHAN L. HAND

Eff. Date 03/14/14

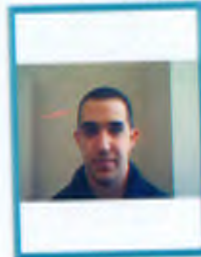
Exp. Date 03/14/15

A1041945

Member of C.O.N.E.S.

WBR WB-RENEW

15



Fuss & O'Neill EnviroScience, LLC

146 Hartford Road, Manchester, CT 06040 – (860) 646-2469

This is to certify that

Jonathan Hand

xxx-xx-8836

has successfully completed the
4 Hr. Asbestos Inspector Refresher
Asbestos Accreditation under TSCA Title II
40 CFR Part 763



John Rowinski, Principal Instructor



Robert L. May, Jr., Training Manager

January 6, 2014

Date of Course

AI-R-01/14-1

Certificate Number

January 6, 2014

Examination Date

January 6, 2015

Expiration Date

Appendix B

Asbestos Analytical Report and Chain of Custody Forms



EMSL Analytical, Inc.

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EMSL Order ID: 041415772
Customer ID: ENVI54
Customer PO: 20140444.A1E
Project ID:

Attn: Dustin Diedricksen
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (860) 646-2469
Fax: (888) 838-1160
Collected: 6/ 2/2014
Received: 6/05/2014
Analyzed: 6/07/2014

Proj: 20140444.A1E / Former West Bay Elementary School

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-01A

Lab Sample ID: 041415772-0001

Sample Description: Exterior portico roof/blue/gray asphalt shingle

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	15%	85%	None Detected	

Client Sample ID: 0602JH-01B

Lab Sample ID: 041415772-0002

Sample Description: Exterior portico roof/blue/gray asphalt shingle

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-02A

Lab Sample ID: 041415772-0003

Sample Description: Exterior portico roof/black roofing paper

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	40%	60%	None Detected	

Client Sample ID: 0602JH-02B

Lab Sample ID: 041415772-0004

Sample Description: Exterior portico roof/black roofing paper

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	50%	50%	None Detected	

Client Sample ID: 0602JH-03A

Lab Sample ID: 041415772-0005

Sample Description: Exterior roof/red/borwn slater's mud

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	92%	8% Chrysotile	

Client Sample ID: 0602JH-03B

Lab Sample ID: 041415772-0006

Sample Description: Exterior roof/red/borwn slater's mud

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-04A

Lab Sample ID: 041415772-0007

Sample Description: Exterior north/exterior white window

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	95%	5% Chrysotile	



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Project ID:

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-04B **Lab Sample ID:** 041415772-0008

Sample Description: Exterior south/caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-05A **Lab Sample ID:** 041415772-0009

Sample Description: Exterior door 1/brown int/ext door caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	94%	6% Chrysotile	

Client Sample ID: 0602JH-05B **Lab Sample ID:** 041415772-0010

Sample Description: Exterior door 4/brown int/ext door caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-06A **Lab Sample ID:** 041415772-0011

Sample Description: Exterior north/white louver caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-06B **Lab Sample ID:** 041415772-0012

Sample Description: Exterior south/white louver caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-07A **Lab Sample ID:** 041415772-0013

Sample Description: Exterior north/white concealed old window caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
400 PLM Pt Ct	6/06/2014	White	0%	98.75%	1.25% Chrysotile	

Client Sample ID: 0602JH-07B **Lab Sample ID:** 041415772-0014

Sample Description: Exterior south/white concealed old window caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-08A **Lab Sample ID:** 041415772-0015

Sample Description: Exterior south/residual black caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	85%	15% Chrysotile	



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Project ID:

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-08B **Lab Sample ID:** 041415772-0016

Sample Description: Exterior south/residual black caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-09A **Lab Sample ID:** 041415772-0017

Sample Description: Cafeteria/1'x1' dot pattern ceiling tiles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	95%	5%	None Detected	

Client Sample ID: 0602JH-09B **Lab Sample ID:** 041415772-0018

Sample Description: Kitchen/1'x1' dot pattern ceiling tiles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	95%	5%	None Detected	

Client Sample ID: 0602JH-10A **Lab Sample ID:** 041415772-0019

Sample Description: Cafeteria/dark brown glue daubs a/w 09

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
400 PLM Pt Ct	6/06/2014	Brown	0%	97.50%	2.50% Chrysotile	

Client Sample ID: 0602JH-10B **Lab Sample ID:** 041415772-0020

Sample Description: Kitchen/dark brown glue daubs a/w 09

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-11A **Lab Sample ID:** 041415772-0021

Sample Description: Cafeteria/white 3'x5' acoustic wall pannel pinhole

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	75%	25%	None Detected	

Client Sample ID: 0602JH-11B **Lab Sample ID:** 041415772-0022

Sample Description: Cafeteria/white 3'x5' acoustic wall pannel pinhole

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	75%	25%	None Detected	

Client Sample ID: 0602JH-12A **Lab Sample ID:** 041415772-0023

Sample Description: Cafeteria/kight brown glue daubs a/w 11

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-12B **Lab Sample ID:** 041415772-0024

Sample Description: Cafeteria/kight brown glue daubs a/w 11

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-13A **Lab Sample ID:** 041415772-0025

Sample Description: Cafeteria/2'x4' fissure & dot ceiling tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	80%	20%	None Detected	

Client Sample ID: 0602JH-13B **Lab Sample ID:** 041415772-0026

Sample Description: Room 21/2'x4' fissure & dot ceiling tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	80%	20%	None Detected	

Client Sample ID: 0602JH-14A **Lab Sample ID:** 041415772-0027

Sample Description: Room 2/brown chalk board glue daubs

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-14B **Lab Sample ID:** 041415772-0028

Sample Description: Room 33/brown chalk board glue daubs

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-15A **Lab Sample ID:** 041415772-0029

Sample Description: Room 2/4" brown vinyl baseboard

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-15B **Lab Sample ID:** 041415772-0030

Sample Description: Room 17/4" brown vinyl baseboard

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-16A **Lab Sample ID:** 041415772-0031

Sample Description: Room 2/dark borwn adhesive a/w 15

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-16B **Lab Sample ID:** 041415772-0032

Sample Description: Room 17/dark borwn adhesive a/w 15

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-17A **Lab Sample ID:** 041415772-0033

Sample Description: Caf /12"x12" tan mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-17B **Lab Sample ID:** 041415772-0034

Sample Description: Room 21/12"x12" tan mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Tan	0%	100%	None Detected	

Client Sample ID: 0602JH-18A **Lab Sample ID:** 041415772-0035

Sample Description: Caf /12"x12" light brown mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-18B **Lab Sample ID:** 041415772-0036

Sample Description: Room 11/12"x12" light brown mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-19A **Lab Sample ID:** 041415772-0037

Sample Description: Caf /black mastic a/w 12"x12" floor tiles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-19B **Lab Sample ID:** 041415772-0038

Sample Description: Room 11/black mastic a/w 12"x12" floor tiles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-19C **Lab Sample ID:** 041415772-0039

Sample Description: Room 21/black mastic a/w 12"x12" floor tiles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	



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Project ID:

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-20A **Lab Sample ID:** 041415772-0040

Sample Description: Café/corrugated paper type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	15%	45%	40% Chrysotile	

Client Sample ID: 0602JH-20B **Lab Sample ID:** 041415772-0041

Sample Description: Room 21/corrugated paper type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-20C **Lab Sample ID:** 041415772-0042

Sample Description: Room 6/corrugated paper type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-21A **Lab Sample ID:** 041415772-0043

Sample Description: Café/hard packed pipe fitting insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	40%	60% Chrysotile	

Client Sample ID: 0602JH-21B **Lab Sample ID:** 041415772-0044

Sample Description: Room 9/hard packed pipe fitting insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-21C **Lab Sample ID:** 041415772-0045

Sample Description: Room 12/hard packed pipe fitting insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-22A **Lab Sample ID:** 041415772-0046

Sample Description: Café/black wall panel adhesive

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-22B **Lab Sample ID:** 041415772-0047

Sample Description: Café/black wall panel adhesive

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	



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Project ID:

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-23A **Lab Sample ID:** 041415772-0048

Sample Description: Room 2/12x12 pink mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Pink	0%	100%	None Detected	

Client Sample ID: 0602JH-23B **Lab Sample ID:** 041415772-0049

Sample Description: Room 17/12x12 pink mottled floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Pink	0%	100%	None Detected	

Client Sample ID: 0602JH-24A **Lab Sample ID:** 041415772-0050

Sample Description: Room 1/yellow stair tread mastic

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Yellow	0%	100%	None Detected	

Client Sample ID: 0602JH-24B **Lab Sample ID:** 041415772-0051

Sample Description: Room 8/yellow stair tread mastic

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Yellow	0%	100%	None Detected	

Client Sample ID: 0602JH-25A **Lab Sample ID:** 041415772-0052

Sample Description: Room 4/black sink undercoat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-25B **Lab Sample ID:** 041415772-0053

Sample Description: Room 11/black sink undercoat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-26A **Lab Sample ID:** 041415772-0054

Sample Description: Room 11/12"x12" white w/light blue splotches floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-26B **Lab Sample ID:** 041415772-0055

Sample Description: Room 11/12"x12" white w/light blue splotches floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White/Blue	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-27A **Lab Sample ID:** 041415772-0056

Sample Description: Room 11/yellow mastic a/w 12"x12" floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Yellow	0%	100%	None Detected	

Client Sample ID: 0602JH-27B **Lab Sample ID:** 041415772-0057

Sample Description: Room 16/yellow mastic a/w 12"x12" floor tile

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Yellow	0%	100%	None Detected	

Client Sample ID: 0602JH-28A **Lab Sample ID:** 041415772-0058

Sample Description: Room 11/dark gray leveling compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-28B **Lab Sample ID:** 041415772-0059

Sample Description: Room 11/dark gray leveling compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-29A **Lab Sample ID:** 041415772-0060

Sample Description: Room 11/off white square pattern linoleum flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	20%	80%	None Detected	

Client Sample ID: 0602JH-29B **Lab Sample ID:** 041415772-0061

Sample Description: Room 11/off white square pattern linoleum flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	20%	80%	None Detected	

Client Sample ID: 0602JH-30A **Lab Sample ID:** 041415772-0062

Sample Description: Room 11/white adhesive a/w 29

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Tan	0%	100%	None Detected	

Client Sample ID: 0602JH-30B **Lab Sample ID:** 041415772-0063

Sample Description: Room 11/white adhesive a/w 29

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Tan	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-31A **Lab Sample ID:** 041415772-0064

Sample Description: Room 12/white interior door caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-31B **Lab Sample ID:** 041415772-0065

Sample Description: Room 22/white interior door caulking

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-32A **Lab Sample ID:** 041415772-0066

Sample Description: Room 13/pre-formed black type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	30%	10% Amosite 60% Chrysotile	

Client Sample ID: 0602JH-32B **Lab Sample ID:** 041415772-0067

Sample Description: Room 17/pre-formed black type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014				Stop Positive (Not Analyzed)	

Client Sample ID: 0602JH-32C **Lab Sample ID:** 041415772-0068

Sample Description: Room 9/pre-formed black type pipe insulation

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014				Stop Positive (Not Analyzed)	

Client Sample ID: 0602JH-33A **Lab Sample ID:** 041415772-0069

Sample Description: Room 14 boiler room/gray flue patching compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	5%	85%	5% Amosite 5% Chrysotile	Sample may be contaminated. Sample may be contaminated.

Client Sample ID: 0602JH-33B **Lab Sample ID:** 041415772-0070

Sample Description: Room 14 boiler room/gray flue patching compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014				Stop Positive (Not Analyzed)	

Client Sample ID: 0602JH-34A **Lab Sample ID:** 041415772-0071

Sample Description: Room 14 boiler room/gray duct seam sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-34B **Lab Sample ID:** 041415772-0072

Sample Description: Room 14 boiler room/gray duct seam sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-35A **Lab Sample ID:** 041415772-0073

Sample Description: Room 14 boiler room/white pipe thread sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-35B **Lab Sample ID:** 041415772-0074

Sample Description: Room 14 boiler room/white pipe thread sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White/Green	15%	85%	None Detected	

Client Sample ID: 0602JH-36A **Lab Sample ID:** 041415772-0075

Sample Description: Room 15/black mastic on speaker box

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	94%	6% Chrysotile	

Client Sample ID: 0602JH-36B **Lab Sample ID:** 041415772-0076

Sample Description: Room 24/black mastic on speaker box

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)

Client Sample ID: 0602JH-37A **Lab Sample ID:** 041415772-0077

Sample Description: Room 14 boiler room/boiler ribbing rope gasket

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	95%	5%	None Detected	

Client Sample ID: 0602JH-37B **Lab Sample ID:** 041415772-0078

Sample Description: Room 14 boiler room/boiler ribbing rope gasket

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	95%	5%	None Detected	

Client Sample ID: 0602JH-37C **Lab Sample ID:** 041415772-0079

Sample Description: Room 14 boiler room/boiler ribbing rope gasket

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	95%	5%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-38A **Lab Sample ID:** 041415772-0080

Sample Description: Room 22/gray window glazing compound a/w interior window wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
400 PLM Pt Ct	6/06/2014	Gray	0%	97.75%	2.25% Chrysotile	

Client Sample ID: 0602JH-38B **Lab Sample ID:** 041415772-0081

Sample Description: Room 22/gray window glazing compound a/w interior window wall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014				Stop Positive (Not Analyzed)	

Client Sample ID: 0602JH-39A **Lab Sample ID:** 041415772-0082

Sample Description: Room 21/yellow carpet glue

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-39B **Lab Sample ID:** 041415772-0083

Sample Description: Room 33/yellow carpet glue

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Brown	0%	100%	None Detected	

Client Sample ID: 0602JH-40A **Lab Sample ID:** 041415772-0084

Sample Description: Room 33/dark brown chalk board skim glue

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-40B **Lab Sample ID:** 041415772-0085

Sample Description: Room 34/dark brown chalk board skim glue

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Black	0%	100%	None Detected	

Client Sample ID: 0602JH-41A **Lab Sample ID:** 041415772-0086

Sample Description: Room 32/gray cement wall tile grout

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-41B **Lab Sample ID:** 041415772-0087

Sample Description: Room 30/gray cement wall tile grout

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-42A **Lab Sample ID:** 041415772-0088

Sample Description: Room 32/gray wall ceramic wall tile adhesive

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-42B **Lab Sample ID:** 041415772-0089

Sample Description: Room 30/gray wall ceramic wall tile adhesive

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-43A **Lab Sample ID:** 041415772-0090

Sample Description: Room 32/white sink caulling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-43B **Lab Sample ID:** 041415772-0091

Sample Description: Room 30/white sink caulling

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-44A **Lab Sample ID:** 041415772-0092

Sample Description: Room 32/gray ceramic floor tile mud set

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-44B **Lab Sample ID:** 041415772-0093

Sample Description: Room 30/gray ceramic floor tile mud set

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-45A **Lab Sample ID:** 041415772-0094

Sample Description: Room 38/white sink undercoat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
400 PLM Pt Ct	6/06/2014	White	0%	98.50%	1.50% Chrysotile	

Client Sample ID: 0602JH-45B **Lab Sample ID:** 041415772-0095

Sample Description: Room 38/white sink undercoat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014					Stop Positive (Not Analyzed)



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Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Client Sample ID: 0602JH-46A **Lab Sample ID:** 041415772-0096

Sample Description: Exterior/black roof felt paper a/w slate roofing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	40%	60%	None Detected	

Client Sample ID: 0602JH-46B **Lab Sample ID:** 041415772-0097

Sample Description: Exterior/black roof felt paper a/w slate roofing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Black	50%	50%	None Detected	

Client Sample ID: 0602JH-47A **Lab Sample ID:** 041415772-0098

Sample Description: Room 39/yellow retangle pattern linoleum flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Tan	23%	77%	None Detected	

Client Sample ID: 0602JH-47B **Lab Sample ID:** 041415772-0099

Sample Description: Room 39/yellow retangle pattern linoleum flooring

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Yellow	20%	80%	None Detected	

Client Sample ID: 0602JH-48A **Lab Sample ID:** 041415772-0100

Sample Description: Room 39/gray mastic a/w 47

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-48B **Lab Sample ID:** 041415772-0101

Sample Description: Room 39/gray mastic a/w 47

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Gray	0%	100%	None Detected	

Client Sample ID: 0602JH-49A **Lab Sample ID:** 041415772-0102

Sample Description: Attic/residual black built-up roofing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	15%	85%	None Detected	

Client Sample ID: 0602JH-49B **Lab Sample ID:** 041415772-0103

Sample Description: Attic/residual black built-up roofing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Black	15%	85%	None Detected	



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Client Sample ID: 0602JH-50A **Lab Sample ID:** 041415772-0104

Sample Description: Attic/brown roof paper

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Brown	95%	5%	None Detected	

Client Sample ID: 0602JH-50B **Lab Sample ID:** 041415772-0105

Sample Description: Attic/residual built-up roofing

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Brown	95%	5%	None Detected	

Client Sample ID: 0602JH-51A **Lab Sample ID:** 041415772-0106

Sample Description: Attic/residual black & gold asphalt shingles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Black	30%	70%	None Detected	

Client Sample ID: 0602JH-51B **Lab Sample ID:** 041415772-0107

Sample Description: Attic/residual black & gold asphalt shingles

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Black	30%	70%	None Detected	

Client Sample ID: 0602JH-52A **Lab Sample ID:** 041415772-0108

Sample Description: Room 2/gray drywall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	13%	87%	None Detected	

Client Sample ID: 0602JH-52B **Lab Sample ID:** 041415772-0109

Sample Description: Café/gray drywall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	13%	87%	None Detected	

Client Sample ID: 0602JH-52C **Lab Sample ID:** 041415772-0110

Sample Description: Room 21/gray drywall

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	20%	80%	None Detected	

Client Sample ID: 0602JH-53A **Lab Sample ID:** 041415772-0111

Sample Description: Room 2/white joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	



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Client Sample ID: 0602JH-53B **Lab Sample ID:** 041415772-0112
Sample Description: Room 17/white joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-53C **Lab Sample ID:** 041415772-0113
Sample Description: Room 21/white joint compound

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-54A **Lab Sample ID:** 041415772-0114
Sample Description: Café/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-54B **Lab Sample ID:** 041415772-0115
Sample Description: Room 2/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-54C **Lab Sample ID:** 041415772-0116
Sample Description: Room 17/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-54D **Lab Sample ID:** 041415772-0117
Sample Description: Room 38/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-54E **Lab Sample ID:** 041415772-0118
Sample Description: Room 24/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-54F **Lab Sample ID:** 041415772-0119
Sample Description: Room 36/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Gray	0%	100%	None Detected	



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Client Sample ID: 0602JH-54G **Lab Sample ID:** 041415772-0120

Sample Description: Room 23/gray plaster rough coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	Gray	3%	97%	None Detected	

Client Sample ID: 0602JH-55A **Lab Sample ID:** 041415772-0121

Sample Description: Café/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55B **Lab Sample ID:** 041415772-0122

Sample Description: Room 2/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55C **Lab Sample ID:** 041415772-0123

Sample Description: Room 17/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55D **Lab Sample ID:** 041415772-0124

Sample Description: Room 38/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55E **Lab Sample ID:** 041415772-0125

Sample Description: Room 24/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/06/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55F **Lab Sample ID:** 041415772-0126

Sample Description: Room 36/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	

Client Sample ID: 0602JH-55G **Lab Sample ID:** 041415772-0127

Sample Description: Room 23/white plaster skim coat

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	6/07/2014	White	0%	100%	None Detected	



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Customer PO: 20140444.A1E
Project ID:

Summary Test Report for Asbestos Analysis of Bulk Material via EPA 600/R-93/116 Method via Polarized Light Microscopy

Analyst(s)

Michael Garrity	PLM	(63)
	400 PLM Pt Ct	(4)
Nancy Stalter	PLM	(44)

Stephen Siegel, CIH, Laboratory Manager
or other Approved Signatory

Any questions please contact Steve Siegel.

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036

Report amended: 06/09/2014 09:57:22 Replaces initial report from: 06/07/2014 06:05:01 Reason Code: Data Entry-Change to Project



06/11/14

50 Redfield St, Suite 100, Boston, MA 02122

(617) 282-4675 Fax (617) 282-8253

Sample Log for Asbestos Bulks

Sheet 1 of 11

Project Name: Former West Bay Elementary School Project No. 20140444.A1E
Building: Former West Bay Elementary School Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
0602JH-01A	Blue/gray asphalt Exterior portico roof	Blue/gray asphalt roof shingle	
-02B	"	"	
-02A	Exterior Portico Roof	Black roofing paper	
-02B	"	"	
-03A	Exterior Roof	Red/Brown Slate's Mud	
-03B	↓	↓	
-04A	Exterior - North	Exterior white window	
-04B	Exterior - South	caulking	
-05A	Exterior - Door 1	Brown Exterior Door	
-05B	↓ - Door 4	↓	
-06A	↓ - North	white Lower caulking	
-06B	↓ - South	↓	

Analysis Method: PLM TEM

Turnaround Time 48 hr

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.

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Samples Collected By: JH KCM Date: 6/2/14 Time: AM/PM

Samples Sent By: Jan Bond Date: 6/3/14 Time: PM

Samples Received by: Cher EMSL FX Date: 6/5/14 Time: 940

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____



Sample Log for Asbestos Bulks

Sheet 2 of 11

Project Name: Former West Bay Elementary School Project No. 20140444 AIE
Building: Former West Bay Elementary School Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
602JH-07A	Exterior - North	white concealed old window caulking	
-07B	↓ - South	↓	
-08A	↓ - South	Residual Black caulking	lower
-08B	↓ - West South	↓	Door > 40 ft
-09A	Cafeteria	1'x1' Dot pattern Ceiling Tiles	
-09B	Kitchen	↓	
-10A	Cafeteria	Dark Brown Glue dubs A/W	
-10B	Kitchen	-09 ↓	
-11A	Cafeteria	white 3'x5' acoustic wall panel pinhole	
-11B	↓	↓	
-12A	Cafeteria	Light Brown Glue dubs A/W	
-12B	↓	↓	

Analysis Method: PLM TEM

Turnaround Time 48

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.

Samples Collected By: JH & CM Date: 6/2/14 Time: AM/PM

Samples Sent By: Jon Hand Date: 6/3/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____

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Sample Log for Asbestos Bulks

Sheet 3 of 11

Project Name: Former West Bay Elementary School Project No. 20140444.AIE
 Building: ↓ Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
602JH-13A	Cafeteria	2'x4' Fissure + Dot ceiling tile	
-13B	Room 21	↓	
-14A	Room 2	Brown Chalkboard Glue	Chalkboard
-14B	Room 33	Dabs	↓
-15A	Room 2	4" Brown Vinyl Base Board	
-15B	Room 17	↓	
-16A	Room 2	Dark Brown Adhesive Allw	-15
-16B	Room 17	↓	
-17A	Cafeteria	12"x12" Tan Mottled Floor tile	
-17B	Room 21	↓	
-18A	Cafe	12"x12" Light Brown Mottled Floor tile	
-18B	Room 4	↓	

Analysis Method: PLM TEM

Turnaround Time 45

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.

Samples Collected By: J. W. ... Date: 6/2/14 Time: AM/PM

Samples Sent By: Jan ... Date: 6/3/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____

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Sample Log for Asbestos Bulks

Sheet 9 of 11

Project Name: Fomer West Bay Elementary School Project No. 20140444-A1E
 Building: ↓ Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
602JH-19A	Cafe	Black mastec A/W 12"x12"	
-19B	Room 11		
-19C	Room 21		
-20A	Cafe	Corrugated Paper Fiberglass Type Pipe insulation	
-20B	Room 12		
-20C	Room 6		
-21A	Cafe	Hand packed Pipe Fitting Insulation	
-21B	Room 9		
-21C	Room 12		
-22A	Cafe	Black wall panel Adhesive	
-22B	↓		
-23A	Room 2	12x12 Pink mottled Floor tile	

Analysis Method: PLM TEM

Turnaround Time 48h

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: . Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: JH + cm Date: 6/2/14 Time: AM / PM

Samples Sent By: Jon hand Date: 6/3/14 Time: PM

Samples Received by: - Date: Time:

Shipped To: EMSL State MA Other

Method of Shipment: Fed Ex UPS Overnight UPS Ground Lab Drop Off

14 JUN 15 11:37
 MEDICAL
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Sample Log for Asbestos Bulks

Sheet 5 of 11

Project Name: Finner West Bay Elementary School

Project No. 20140444.AIE

Building: _____

Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
6025H-23B	Room 17	↓	
-24A	Room 1	Yellow stair Tread Mastic	
-24B	Room 8	↓	
-25A	Room 4	Black sink undercoat	
-25B	Room 11	↓	
-26A	Room 11	12"x12" white w/ light blue splatters Floor tile	
-26B	↓	↓	
-27A	↓	Yellow mastic A/W 12"x12" Floor Tiles	
-27B	Room 16	↓	
-28A	Room 11	Dark gray leveling compound	
-28B	↓	↓	
-29A	↓	off-white square pattern Limestone Flooring	

Analysis Method: PLM TEM

Turnaround Time _____

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: JL + CM Date: 6/2/14 Time: AM/PM

Samples Sent By: Jon Hand Date: 6/2/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Lab Drop Off

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Sample Log for Asbestos Bulks

Sheet 6 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
602JH-29B	↓	↓	
-30A	↓	white Adhesive BW	
-30B	↓	-29	
-31A	Room 12	white Interior Door caulking	
-31B	Room 22	↓	
-32A	Room 13	Pre-Formed Block Type Pipe Insulation	
-32B	Room 17	↓	
-32C	Room 9	↓	
-33A	Room 14 (Boiler Room)	Gray Flue Patching compound	
-33B	↓	↓	
-34A	↓	Gray Duct Seam Sealant	
-34B	↓	↓	

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: Jon Hand and Chris Mac Date: 6/3/14 Time: Am / PM

Samples Sent By: Jon Hand Date: 6/3/14 Time: PM

Samples Received By: _____ Date: _____ Time: _____

Shipped To: EMSL State _____ Other _____

Method of Shipment: Fed Ex UPS Lab Drop Off

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Sample Log for Asbestos Bulks

Sheet 7 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
602 JH-35A	Room 14 (Boiler Room)	white pipe thread sealant	
-35B	↓	↓	
-36A	Room 15	black mastic on speaker box	3sf ca
-36B	Room 24	↓	
-37A	Room 14 (Boiler Room)	Boiler Ribbing Rope Gasket	
-37B	↓	↓	
-37C	↓	↓	
-38A	Room 22	Gray window Glazing compound At interior window wall	
-38B	Room 22	+	
-39A	Room 21	Yellow Carpet Glue	
-39B	Room 33	↓	
-40A	Room 33	Dark Brown Chalkboard shim glue	

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: Jon Hand and Chris Mac Date: 6/13/14 Time: AM / PM

Samples Sent By: Jon Hand Date: ↓ Time: PM

Samples Received By: _____ Date: _____ Time: _____

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Method of Shipment: Fed Ex UPS Lab Drop Off

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02/14/15 772

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Sample Log for Asbestos Bulks

Sheet 8 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
6025H-40B	Room 34	↓	
-41A	Room 32	Gray Ceramic wall Tile Grout	
-41B	Room 30	↓	
-42A	Room 32	Gray ceramic wall Tile Adhesive	
-42B	Room 30	↓	
-43A	Room 32	white sink caulking	
-43B	Room 30	↓	
-44A	Room 32	Gray ceramic Floor Tile mortar set	
-44B	Room 30	↓	
-45A	Room 38	white sink undercoat	
-45B	↓	↓	
-46A	Exterior	Black Roof Felt Paper Asphalt Roofing	

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: . Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

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Samples Collected By: Jon Hand and Chris Mac Date: 6/3/14 Time: AM/PM

Samples Sent By: Jon Hand Date: Time: PM

Samples Received By: Date: Time:

Shipped To: EMSL State MA Other

Method of Shipment: Fed Ex UPS Lab Drop Off



04/14/15 972

Sample Log for Asbestos Bulks

Sheet 9 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
502 JH-46B	↓	↓	
-47A	Room 39	Yellow Rectangle pattern Limestone Flooring	
-47B	↓	↓	
-48A	↓	Gray marble tile	
-48B	↓	↓	
-49A	Attic	Residual Black Built up Roofing	
-49B	↓	↓	
-50A	↓	Brown Roof Paper And Residual Built-up Roofing	
-50B	↓	↓	
-51A	↓	Residual Black & Gold Asphalt Shingles	
-51B	↓	↓	
-52A	Room 2	Gray Dry wall	

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: . Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

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Samples Collected By: Jon Hand and Chris Mac Date: 6/13/14 Time: AM/PM

Samples Sent By: Jon Hand Date: ↓ Time: PM

Samples Received By: Date: Time:

Shipped To: EMSL State MA Other

Method of Shipment: Fed Ex UPS Lab Drop Off



041415772

Sample Log for Asbestos Bulks

Sheet 10 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
6025H-52B	Cafe	↓	
-52C	Room 21		
-53A	Room 2	white Joint compound	
-53B	Cafe Room 17	↓	
-53C	Room 21		
-54A	Cafe	gray plaster rough coat	ceiling
-54B	Room 2	↓	ceiling
-54C	Room 17		ceiling
-54D	Room 38		ceiling
-54E	Room 24		wall
-54F	Room 36		wall
-54G	Room 23		wall

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: Jon Hand and Chris Mac Date: 6/13/14 Time: AM/PM

Samples Sent By: Jon Hand Date: ↓ Time: PM

Samples Received By: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Lab Drop Off

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Sample Log for Asbestos Bulks

Sheet 11 of 11

Project Name: West Bay Elementary School Project No. 20140444.A1E

Building: West Bay Elementary School Project Manager: Dustin D

Sample ID	Sample Location	Material	Comments
60254-55A	Cafe	white - Plaster SK on Coat	cell only
-55B	Room 2	↓	↓
-55C	Room 17		
-55D	Room 38		
-55E	Room 24		
-55F	Room 36		
-55G	Room 23		

Analysis Method: PLM TEM

Turnaround Time 48 Hours

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: . Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

E-mail Results to project manager listed above.

Special Instruction: Stop at first positive in each set. Do not point count. Do not layer samples

Samples Collected By: Jon Hand and Chris Mac Date: 4/13/14 Time: Am/PM

Samples Sent By: Jon Hand Date: Time: PM

Samples Received By: Date: Time:

Shipped To: EMSL State MA Other

Method of Shipment: Fed Ex UPS Lab Drop Off

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EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>

cinnaslab@EMSL.com

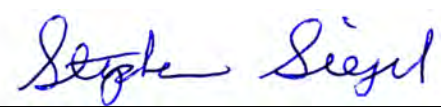
EMSL Order:	041421586
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: Dustin Diedricksen Fuss & O'Neill EnviroScience, LLC 146 Hartford Road Manchester, CT 06040	Phone: (860) 646-2469 Fax: (888) 838-1160 Received: 07/28/14 8:35 AM Analysis Date: 7/29/2014 Collected:
Project: West Bay Elementary School & Osterville Community Center / 99 West Bay Road, Osterville, MA / 20140444.A1E	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01A-JH-725 <i>041421586-0001</i>	Osterville Community Center Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
01B-JH-725 <i>041421586-0002</i>	Osterville Community Center Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
02A-JH-725 <i>041421586-0003</i>	West Bay Elementary School Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
02B-JH-725 <i>041421586-0004</i>	West Bay Elementary School Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)
 Andrew Castellano (2)
 Quynh Vu (2)


 Stephen Siegel, CIH, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from 07/29/2014 16:22:22



EMSL Analytical, Inc.

7 Constitution Way, Suite 107, Woburn, MA 01801

Phone/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com>

bostonlab@emsl.com

EMSL Order:	131402072
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: **Dustin Diedricksen**
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040


Phone: (860) 646-2469
 Fax: (888) 838-1160
 Received: 06/02/14 8:30 AM
 Analysis Date: 6/3/2014
 Collected: 5/30/2014

Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-01A <i>131402072-0001</i>	Entry - Tan Granular Pattern Linoleum Flooring	Tan Fibrous Homogeneous	35% Cellulose	65% Non-fibrous (other)	None Detected
0530JH-01B <i>131402072-0002</i>	Men's Bathroom - Tan Granular Pattern Linoleum Flooring	Gray/Tan Fibrous Homogeneous	35% Cellulose	65% Non-fibrous (other)	None Detected
0530JH-02A <i>131402072-0003</i>	Entry - Tan Mastic a/w Tan Granular Pattern Linoleum Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-02B <i>131402072-0004</i>	Men's Bathroom - Tan Mastic a/w Tan Granular Pattern Linoleum Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-03A <i>131402072-0005</i>	Game Room - 12x12 White?Black Splotch Floor Tile	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-03B <i>131402072-0006</i>	Game Room - 12x12 White?Black Splotch Floor Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-04A <i>131402072-0007</i>	Game Room - Mastic a/w 03	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)
 Fievel Lam (33)
 Steve Grise (23)


 Steve Grise, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3 and VT AL357102

Initial report from 06/03/2014 17:08:05

**EMSL Analytical, Inc.**

7 Constitution Way, Suite 107, Woburn, MA 01801

Phone/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com>bostonlab@emsl.com

EMSL Order:	131402072
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: **Dustin Diedricksen**
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (860) 646-2469
 Fax: (888) 838-1160
 Received: 06/02/14 8:30 AM
 Analysis Date: 6/3/2014
 Collected: 5/30/2014

Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-04B <small>131402072-0008</small>	Game Room - Mastic a/w 03	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-05A <small>131402072-0009</small>	Men's Bathroom - 4" Brown Vinyl Base Board	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-05B <small>131402072-0010</small>	Game Room - 4" Brown Vinyl Base Board	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-06A <small>131402072-0011</small>	Men's Bathroom - Tan Mastic a/w 05	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-06B <small>131402072-0012</small>	Game Room - Tan Mastic a/w 05	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-07A <small>131402072-0013</small>	Game Room Closet - Pink Drywall	Gray/Pink Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (other)	None Detected
0530JH-07B <small>131402072-0014</small>	Game Room Closet - Pink Drywall	Gray/Pink Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (other)	None Detected
0530JH-07C <small>131402072-0015</small>	Game Room Closet - Pink Drywall	Gray/Pink Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (other)	None Detected

Analyst(s)
 Fievel Lam (33)
 Steve Grise (23)

Steve Grise, Laboratory Manager
 or other approved signatory

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Initial report from 06/03/2014 17:08:05

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EMSL Order:	131402072
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: **Dustin Diedricksen**
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (860) 646-2469
 Fax: (888) 838-1160
 Received: 06/02/14 8:30 AM
 Analysis Date: 6/3/2014
 Collected: 5/30/2014

Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-08A <i>131402072-0016</i>	Game Room Closet - White Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-08B <i>131402072-0017</i>	Game Room Closet - White Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-08C <i>131402072-0018</i>	Game Room Closet - White Joint Compound	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-09A <i>131402072-0019</i>	Game Room - White Interio Door Caulking	White Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-09B <i>131402072-0020</i>	Gynmasium - White Interio Door Caulking	White Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-10A <i>131402072-0021</i>	Game Room - 2x4 White Pin/Fissure Ceiling Tile	Gray Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (other)	None Detected
0530JH-10B <i>131402072-0022</i>	Game Room - 2x4 White Pin/Fissure Ceiling Tile	Gray/White Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (other)	None Detected
0530JH-11A <i>131402072-0023</i>	Entry - 2x4 Sand Texture Ceiling Tile	Gray Fibrous Homogeneous	65% Cellulose 20% Min. Wool	15% Non-fibrous (other)	None Detected

Analyst(s)
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 Steve Grise (23)

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Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-11B <i>131402072-0024</i>	Men's Bathroom - 2x4 Sand Texture Ceiling Tile	Gray/White Fibrous Homogeneous	65% Cellulose 20% Min. Wool	15% Non-fibrous (other)	None Detected
0530JH-12A <i>131402072-0025</i>	Entry - Brown Int/Ext Window Wall Caulking	Brown Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
0530JH-12B <i>131402072-0026</i>	Entry - Brown Int/Ext Window Wall Caulking				Stop Positive (Not Analyzed)
0530JH-13A <i>131402072-0027</i>	Office - 4" Grey Vinyl Base Board	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-13B <i>131402072-0028</i>	Office - 4" Grey Vinyl Base Board	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-14A <i>131402072-0029</i>	Office - Light Brown Carpet Adhesive	Yellow Fibrous Homogeneous	5% Cellulose	95% Non-fibrous (other)	None Detected
0530JH-14B <i>131402072-0030</i>	Office - Light Brown Carpet Adhesive	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-15A <i>131402072-0031</i>	Gym - Tan Adhesive a/w Rubber Gym Floor	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)

Fievel Lam (33)
Steve Grise (23)



Steve Grise, Laboratory Manager
or other approved signatory

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Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-15B <i>131402072-0032</i>	Gym - Tan Adhesive a/w Rubber Gym Floor	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-16A <i>131402072-0033</i>	Exterior Door B Side - Grey Lintel Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-16B <i>131402072-0034</i>	Exterior Door C Side - Grey Lintel Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-17A <i>131402072-0035</i>	Exterior West - Grey Expansion Joint Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-17B <i>131402072-0036</i>	Exterior South - Grey Expansion Joint Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-18A <i>131402072-0037</i>	Exterior West - Brown Expansion Joint Caulking				Not Submitted
0530JH-18B <i>131402072-0038</i>	Exterior North - Brown Expansion Joint Caulking	Brown Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
0530JH-19A <i>131402072-0039</i>	Office - Brown Expansion Joint Caulking	Brown Non-Fibrous Homogeneous		98% Non-fibrous (other)	2% Chrysotile
0530JH-19B <i>131402072-0040</i>	Gym - Brown Expansion Joint Caulking				Stop Positive (Not Analyzed)

Analyst(s)
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 Steve Grise (23)

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Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-20A <i>131402072-0041</i>	Gym - Grey Penetration Sealant a/w Duct Work	Gray Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-20B <i>131402072-0042</i>	Gym - Grey Penetration Sealant a/w Duct Work	Gray Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-21A <i>131402072-0043</i>	Game Room - White Paper a/w Fiberglass Pipe Insulation	White/Silver Fibrous Homogeneous	10% Glass 75% Cellulose	15% Non-fibrous (other)	None Detected
0530JH-21B <i>131402072-0044</i>	Gym - White Paper a/w Fiberglass Pipe Insulation	White/Silver/Blue Fibrous Homogeneous	70% Cellulose 10% Glass	20% Non-fibrous (other)	None Detected
0530JH-22A <i>131402072-0045</i>	Game Room - Pink Sink Undercoat	Pink Fibrous Homogeneous		95% Non-fibrous (other)	5% Chrysotile
0530JH-22B <i>131402072-0046</i>	Game Room - Pink Sink Undercoat				Stop Positive (Not Analyzed)
0530JH-23A <i>131402072-0047</i>	Men's Bathroom - Brown Paper-type Partition Insulation	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (other)	None Detected
0530JH-23B <i>131402072-0048</i>	Men's Bathroom - Brown Paper-type Partition Insulation	Tan Fibrous Homogeneous	95% Cellulose	5% Non-fibrous (other)	None Detected

Analyst(s)
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 Steve Grise (23)


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Project: **20140444.A1E / Osterville Community Center**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-24A <i>131402072-0049</i>	Exterior North - Grey Exterior Door Caulking	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-24B <i>131402072-0050</i>	Exterior East - Grey Exterior Door Caulking	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-25A <i>131402072-0051</i>	Exterior - Red Exterior Foundation Parging Cement	Red Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-25B <i>131402072-0052</i>	Exterior - Red Exterior Foundation Parging Cement	Red Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-25C <i>131402072-0053</i>	Exterior - Red Exterior Foundation Parging Cement	Red Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
0530JH-26A <i>131402072-0054</i>	Exterior East - Black Damproofing	Black Fibrous Homogeneous		91% Non-fibrous (other)	9% Chrysotile
0530JH-26B <i>131402072-0055</i>	Exterior South - Black Damproofing				Stop Positive (Not Analyzed)
0530JH-27A <i>131402072-0056</i>	Exterior East - Black Through-wall Flashing	Black Non-Fibrous Homogeneous		90% Non-fibrous (other)	10% Chrysotile

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Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
0530JH-27B <i>131402072-0057</i>	Exterior South - Black Through-wall Flashing				Stop Positive (Not Analyzed)
0530JH-28A <i>131402072-0058</i>	Entry - Black Window Glazing a/w Interior Windows	Black Non-Fibrous Homogeneous		94% Non-fibrous (other)	6% Chrysotile
0530JH-28B <i>131402072-0059</i>	Office - Black Window Glazing a/w Interior Windows				Stop Positive (Not Analyzed)
0530JH-29A <i>131402072-0060</i>	Entry - White Window Caulking a/w Interior Windows	White Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-29B <i>131402072-0061</i>	Game Room - White Window Caulking a/w Interior Windows	White Non-Fibrous Homogeneous	5% Fibrous (other)	95% Non-fibrous (other)	None Detected
0530JH-30A <i>131402072-0062</i>	Entry - Silver Paper a/w Heater	Silver/Yellow Fibrous Homogeneous	35% Glass	65% Non-fibrous (other)	None Detected
0530JH-30B <i>131402072-0063</i>	Entry - Silver Paper a/w Heater	Silver/Yellow Fibrous Homogeneous	35% Glass	65% Non-fibrous (other)	None Detected

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Sample Log for Asbestos Bulks

 Sheet 1 of 4

 Project Name: Osterville Community Center Project No. 20140444-AIE
 Building: Osterville Community Center Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
1 0530 JH-01A	Entry Tan granular pattern (1st)	Tan Granular pattern linoleum	
2 -01B	Men's bathroom	" " Flooring	
3 -02A	Entry	Tan master A/W	
4 -02B	men's Bathroom	Tan Granular Pattern flooring	
5 -03A	Game Room	12"X12" white w/ Black splashes Floor tile	
6 -03B	↓	↓	
7 -04A	↓	Tan Master A/W -03	
8 -04B	↓	↓	
9 -05A	Men's Bathroom	4" Brown vinyl Baseboard	
10 -05B	Game Room	↓	
11 -06A	men's Bathroom	Tan Master A/W -05	
12 -06B	Game Room	↓	

 Analysis Method: PLM TEM

 Turnaround Time 48 hour

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

 Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.

 Samples Collected By: JH & CM Date: 5/30/14 Time: AM/PM

 Samples Sent By: Jon Hand Date: 5/30/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

 Shipped To: EMSL State _____ Other _____

 Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____

FedEx# 7959 07308020




Sample Log for Asbestos Bulks
Sheet 2 of 6
 Project Name: Osterville Community Center Project No. 20140444.AIE
 Building: Osterville Community Center Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
13 530 JH -07A	Game Room closet	Pink Dry wall	28' x 14'
14 -07B	↓	↓	
15 -07C	↓	↓	
16 -08A	↓	white Joint Compound	
17 -08B	↓	↓	
18 -08C	↓	↓	
19 -09A	Game Room	white Interior Door Caulking	
20 -09B	Gymnasium	↓	
21 -10A	Game Room	2'x4' white pin & fissure ceiling tile	
22 -10B	↓	↓	
23 -11A	Entry	2'x4' sand texture ceiling tile	
24 -11B	Men's Bathroom	↓	

Analysis Method: PLM TEMTurnaround Time 48 hour

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Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____



Sample Log for Asbestos Bulks

Sheet 3 of 6

Project Name: Osterville Community Center Project No. 20140444.AIE

Building: Osterville Community Center Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
25 530 JH-12A	Entry	Brown Interior/Exterior window wall caulking	
26 -12B	↓	↓	
27 -13A	Office	4" Gray Vinyl Base Board	Tan Mastix
28 -13B	↓	↓	
29 -14A	Office	Light Brown carpet adhesive	
30 -14B	↓	↓	
31 -15A	Gym	Tan Adhesive A/W Rubber Gym Floor	
32 -15B	↓	↓	
33 -16A	Exterior Door B side	Gray lintel caulking	20 LF
34 -16B	Exterior Door C side	" "	
35 -17A	Exterior West	Gray Expansion Joint Caulking	
36 -17B	↓ South	↓	

Analysis Method: PLM TEM

Turnaround Time 48 hr

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Samples Collected By: JH & CM Date: 5/30/14 Time: AM/PM

Samples Sent By: Jon Hand Date: 5/30/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____




Sample Log for Asbestos Bulks
Sheet 4 of 4
 Project Name: Ostenville Community Center Project No. 20140444-A1E
 Building: Ostenville Community Center Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
37 530 JH-18A	Exterior - west	Brown Expansion Joint	130 LF
38 -18B	↓ - North	↓ Caulking	
39 -19A	Office	Brown Expansion Joint	Interior
40 -19B	Extended ^{to} North	↓ Caulking	130 LF
41 -20A	Gym	Gray Penetration Sealant	25 lf
42 -20B	↓	↓ A/w Ductwork	
43 -21A	Game Room	White paper a/w fiberglass pipe insulation	
44 -21B	Gym	↓	
45 -22A	Game Room	Pink Sisk undercoat	1 each
46 -22B	↓		
47 -23A	Mens Bathroom	Brown Paper-type partition insulation	
48 -23B	↓	↓	

Analysis Method: PLM TEMTurnaround Time 48 hr

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.Samples Collected By: JH + CM Date: 5/30/14 Time: AM / PMSamples Sent By: Jon Hunt Date: 5/30/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____



Sample Log for Asbestos Bulks

Sheet 5 of 6

Project Name: Osterville Community Center Project No. 20140444.AIE
Building: Osterville community center Project Manager: Dustin D.

Sample ID	Sample Location	Material	Comments
49 5305H-24A	Exterior - North	Gray Exterior Door Caulking	50 yf
50 -24B	↓ East		
51 -25A	Exterior	Red Exterior Foundation parging cement	
52 -25B	↓		
53 -25C	↓		
54 -26A	Exterior East	Black below grade Damp- Proofing	
55 -26B	↓ South		
56 -27A	↓ East	Black Through-wall Flashing	
57 -27B	↓ South		
58 -28A	Entry	Black window Glazing Compound NW	9ea
59 -28B	Office	Interior windows	
60 -29A	Gym Entry	White window caulking NW interior windows	

Analysis Method: PLM TEM

Turnaround Time 48 hr

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____. Please call the EnviroScience Laboratory if analyses will be late at (860) 646-2469.

Fax Results to the EnviroScience Laboratory at: 888-838-1160.

Special Instruction: Stop at first positive in each set. Do not point count. Do not analyze samples not on this chain.

Samples Collected By: JHapm Date: 5/30/14 Time: AM/PM

Samples Sent By: Jan Kund Date: 5/30/14 Time: PM

Samples Received by: _____ Date: _____ Time: _____

Shipped To: EMSL State MA Other _____

Method of Shipment: Fed Ex UPS Overnight UPS Ground Other _____



**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>cinnaslab@EMSL.com

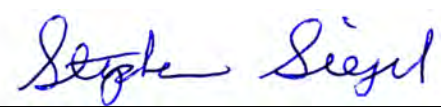
EMSL Order:	041421586
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: Dustin Diedricksen Fuss & O'Neill EnviroScience, LLC 146 Hartford Road Manchester, CT 06040	Phone: (860) 646-2469 Fax: (888) 838-1160 Received: 07/28/14 8:35 AM Analysis Date: 7/29/2014 Collected:
Project: West Bay Elementary School & Osterville Community Center / 99 West Bay Road, Osterville, MA / 20140444.A1E	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01A-JH-725 041421586-0001	Osterville Community Center Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
01B-JH-725 041421586-0002	Osterville Community Center Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
02A-JH-725 041421586-0003	West Bay Elementary School Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
02B-JH-725 041421586-0004	West Bay Elementary School Roof - Black Lap Seam Sealant a/w Rubber Roof	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)
 Andrew Castellano (2)
 Quynh Vu (2)


 Stephen Siegel, CIH, Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%
 Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from 07/29/2014 16:22:22

Appendix C

Lead Screening Field Data Sheets



XRF LEAD SCREENING FIELD DATA SHEET

Inspector: Jon Hand Date: 6/13/14 XRF Model: z RMD ^{LAA-1} Serial: 1395
 Project Name: West Bay Elementary School Project Number: 20140444.AIE
 Address: 99 west Bay Road, Ostrerville, MA Project PM: Dustin D.

XRF Calibration Check - RMD (0.7 to 1.3 mg/cm² inclusive)

	First Reading	Second Reading	Third Reading	Average
Start Check	1.0	1.0	1.0	1.0
Finish Check				

Room	Side	Surface/Component	Substrate*	XRF Reading	Positive
Cafe	B	Door Frame - Brown	M	0.1	
	MCD	Lower wall - clean	W	0.0	
	C2	Door	M	0.0	
		Ceiling - white	P	0.3	
	A4	window sill - Green	W	0.4	
Room 2	A4	window Frame	W	0.1	
	MCD	wall - white	P	0.0	
	A	Door - yellow	M	0.0	
	A	+ Frame - brown	M	0.1	
Kitchen		Ceiling - white	P	0.0	
	A1	Door - yellow	W	0.0	
	A1	+ Frame - brown	M	0.2	
	MCD	wall - white	P	0.1	
	B	wall - L	B	0.2	
Room 6		Ceiling - white	P	0.1	
	A1	Door - green	W	0.0	
	MCD	wall - white	B	0.0	
Room 4		Ceiling - white	P	0.0	
	A	Door - blue	M	0.0	
	BC	wall	D	0.1	
	AD	wall	B	0.1	
		Ceiling	C	0.1	

* Substrate Type: Metal = M, Wood = W, Plaster = P, Drywall = D, Concrete = C, Brick = B, Aluminum = A
 N/A: Not Accessible; N/C: Not Coated; COV: Covered; VR - Vinyl Replacement, POS = Positive



Project Name: _____ Project Number: _____

Room	Side	Surface/Component	Color	Substrate*	XRF Reading	Positive
Room 7	C	Door - green	green	W	0.1	
	C	↓ Frame	Brown	W	0.0	
	ABC	wall	white	B	0.2	
Room 10	C	Door	orange	M	0.0	
	C	↓ Frame	Brown	M	0.1	
	ABC	wall	white	D	0.0	
Room 11	D	Door	Blue	M	0.0	
	D	↓ Frame	brown	M	-0.1	
	BCD	wall	white	D	0.1	
	A	wall	↓	B	0.0	
	B1	ceiling	↓	P	0.5	
Room 12	C	Door	Blue	M	0.0	
	C	↓ Frame	Brown	M	0.1	
	D	wall	white	CMU	0.2	
	ABC	↓	↓	B	0.0	
Room 16	ABC	wall	↓	D	0.1	
	C	Door	orange	M	0.0	
	C	Door Frame	Brown	M	0.0	
	CD	wall	white	B	0.2	
		lolly column	Green	M	-0.2	
	A	Door	Brown	M	0.2	
	A	↓ Frame	↓	M	0.1	
Room 17		ceiling	white	P	0.1	
	C	Door	Green	M	0.0	
	C	Door Frame	Brown	M	1.0	Y
	ABC	lower wall	yellow	W	-0.1	
	ABC	wall	white	DR P	1.0	Y
	D	ceiling	white	P	0.1	
	D	window Frame	↓	W	0.2	

* Substrate Type: Metal = M, Wood = W, Plaster = P, Drywall = D, Concrete = C, Brick = B
N/A: Not Accessible; N/C: Not Coated; COV: Covered; VR - Vinyl Replacement, POS = Positive



XRF LEAD SCREENING FIELD DATA SHEET

Inspector: Jon Hand Date: 5/30/14 XRF Model: RMD-LPA-1 Serial: 1395

Project Name: Osterville Community Center Project Number: 20140444.AIE

Address: 99 West Bay Road, Osterville, MA Project PM: Dustin D.

XRF Calibration Check - RMD (0.7 to 1.3 mg/cm² inclusive)

	First Reading	Second Reading	Third Reading	Average
Start Check	1.0	1.0	1.0	1.0
Finish Check	1.0	1.0	1.0	1.0

Room	Side	Surface/Component	Color	Substrate*	XRF Reading	Positive
Game Room	ABCD	wall	Cream	CMU	0.0	
	D	wall	Cream	D	0.0	
	C	Door	Cream	M	0.0	
	C	↓ Frame	white	M	0.3	
	B	window Frame	white	M	0.2	
Entry & Halls	ABCD	walls	Cream	CMU	0.2	
		window wall	Brown	M	-0.5	
		window Frame	white	M	0.0	
	A2	Door	Cream	W	0.0	
	A2	↓ Frame	Creamy	M	0.0	
Men's Bathroom	ABCD	wall	Cream	CMU	0.0	
		stall walls	Beige	M	0.1	
	C	Door	Cream	W	0.0	
	C	↓ Frame	Cream	M	0.3	
		roof Truss	Rust	M	-0.1	
Women's Bathroom		stall walls	Beige	M	0.0	
	ABCD	wall	Cream	CMU	0.0	
	C	Door	Cream	W	0.0	
	C	↓ Frame	Cream	M	0.2	
Office	B	Door	white	W	0.0	
	B	↓ Frame	white	M	0.2	
	ABCD	wall	Cream	CMU	-0.2	

* Substrate Type: Metal = M, Wood = W, Plaster = P, Drywall = D, Concrete = C, Brick = B, Aluminum = A
N/A: Not Accessible; N/C: Not Coated; COV: Covered; VR - Vinyl Replacement, POS = Positive



Project Name: Osterville Community Center

Project Number: 20140444.AIE

Room	Side	Surface/Component	Color	Substrate*	XRF Reading	Positive
Office (continued)	D	Window Frame	white	M	0.2	
Gym	ABC	wall lower	Blue	CMU	0.0	
	L	wall upper	white	CMU	0.2	
	A2	Door Frame	white	M	0.0	
	B	Door	Blue	M	0.0	
Storage	B	L Frame	Blue	M	0.1	
	B	L Intel	Blue	M	0.1	
	ABC	wall	Cream	CMU	0.0	
	C	Door	Cream	VR	0.0	
Exterior	C	↓ Frame	Cream	M	0.1	
	A	Window wall	Brown	A	0.0	
	A	Entry overhang	white	W	0.0	
	A	Intel	white	M	0.3	
	B	Door	Brown	M	0.0	
	B	L Frame	Brown	M	0.3	
	C	Door	Brown	M	0.0	
C	L Frame	Brown	M	0.1		

* Substrate Type: Metal = M, Wood = W, Plaster = P, Drywall = D, Concrete = C, Block = B
N/A: Not Accessible; N/C: Not Coated; COV: Covered; VR - Vinyl Replacement, POS = Positive

Appendix D

Mercury Waste Characterization Analytical Report and Chain of Custody Forms

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 858-4571

<http://www.EMSL.com>Env_Chemistry@emsl.com

EMSL Order:	011402833
CustomerID:	ENVI54
CustomerPO:	20140444.A1E
ProjectID:	

Attn: **Jon Hand**
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (860) 646-2469
 Fax: (888) 838-1160
 Received: 06/10/14 9:30 AM

Project: 20140444.A1E

Analytical Results

Client Sample Description 602JH-TCLP-01
Gym Floor
Collected: 6/2/2014 **Lab ID:** 0001

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
TCLP 1311/7470A	Mercury	ND	0.0020	mg/L	6/16/2014	JS	6/16/2014	JS

Client Sample Description 602JH-TCLP-02
Gym Floor
Collected: 6/2/2014 **Lab ID:** 0002

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
TCLP 1311/7470A	Mercury	ND	0.0020	mg/L	6/16/2014	JS	6/16/2014	JS

Client Sample Description 602JH-TCLP-03
Gym Floor
Collected: 6/2/2014 **Lab ID:** 0003

Method	Parameter	Result	RL	Units	Prep Date	Analyst	Analysis Date	Analyst
TCLP 1311/7470A	Mercury	ND	0.0020	mg/L	6/16/2014	JS	6/16/2014	JS

Definitions:

ND - indicates that the analyte was not detected at the reporting limit

RL - Reporting Limit



FUSS & O'NEILL ENVIRONMENTAL SCIENCE, LLC

Disciplines to Deliver

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- 146 Hartford Road, Manchester, CT 06040
- 56 Quarry Road, Trumbull, CT 06611
- 1419 Richard Street, Columbia, SC 29201
- 78 Innersate Drive, West Springfield, MA 01089

- 50 Redfield Street, Suite 100, Boston, MA 02122
- 275 Promenade Street, Suite 350, Providence, RI 02908
- 80 Washington Street, Suite 301, Poughkeepsie, NY 12601

CHAIN-OF-CUSTODY RECORD

0508

Turnaround

- 1 Day*
- 2 Days*
- 3 Days*
- Standard (5 days)
- Other _____ (days)
- *Surcharges Apply

PROJECT NAME

Steville Community Center Barnstable, MA

PROJECT LOCATION

PROJECT NUMBER

20140444.A1E

LABORATORY

EMSL

REPORT TO: Dustin Dredrickson

INVOICE TO: ↓

P.O. NO.: 20140444.A1E

Sampler's Signature:

Jon Knud

Date: 6/9/14

Source Codes:

MW=Monitoring Well

PW=Portable Water

S=Soil

W=Waste

SW=Surface Water

T=Treatment Facility

B=Sediment

A=Air

X=Other

Rubber Floor

Item No.	Transfer Check	Sample Number	Source Code	Date Sampled	Time Sampled
1					
2					
3					
4					

602-JH-TCLP-01

X

6/9/14

X

-02

X

↓

X

-03

X

↓

X

TCLP - Hg

Soil VOA Vial, | methanol

Soil VOA Vial, | water

Glass Seal Container () oz

Glass Seal Container () oz

Other _____

Water VOA Vial, | As is | HCl

Glass Amber () ml, | As is | H₂SO₄

Plastic - As is, | 250 ml | 500 | 1000 ml

Plastic - H₂SO₄, | 250 ml | 500 ml

Plastic - HNO₃, 250 ml | Filtered | Unfiltered

Plastic - NaOH, 250 ml

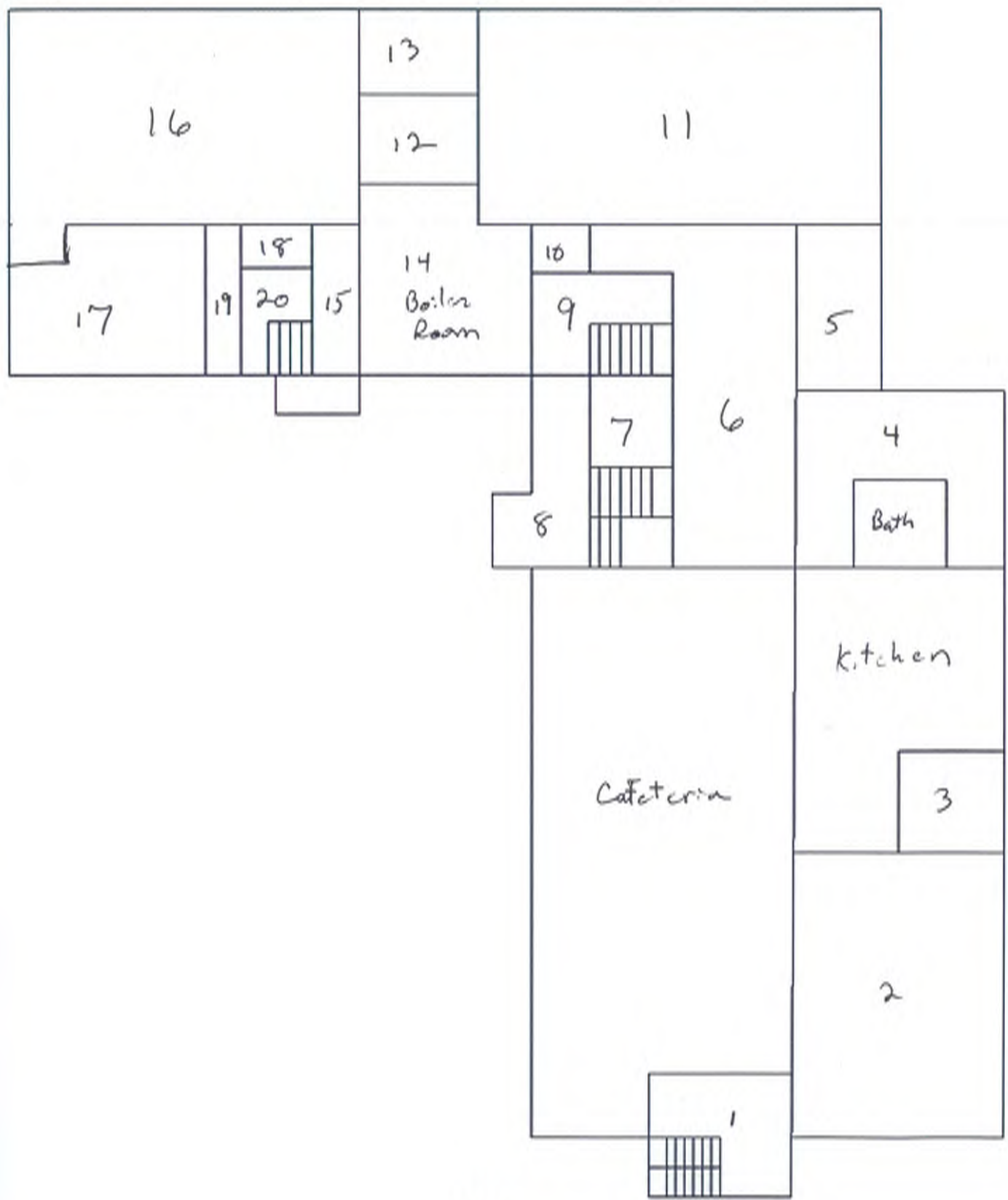
Comments: Gym Floor

Transfer Number	Retrieved By	Accepted By	Date	Time	Reporting and Detection Limit Requirements
1	<i>Jon Knud</i>	<i>Fed Ex</i>	6/9/14	PM 7	Additional Comments
2		<i>S. J. W.</i>	6/10/14	0930	
3					
4					

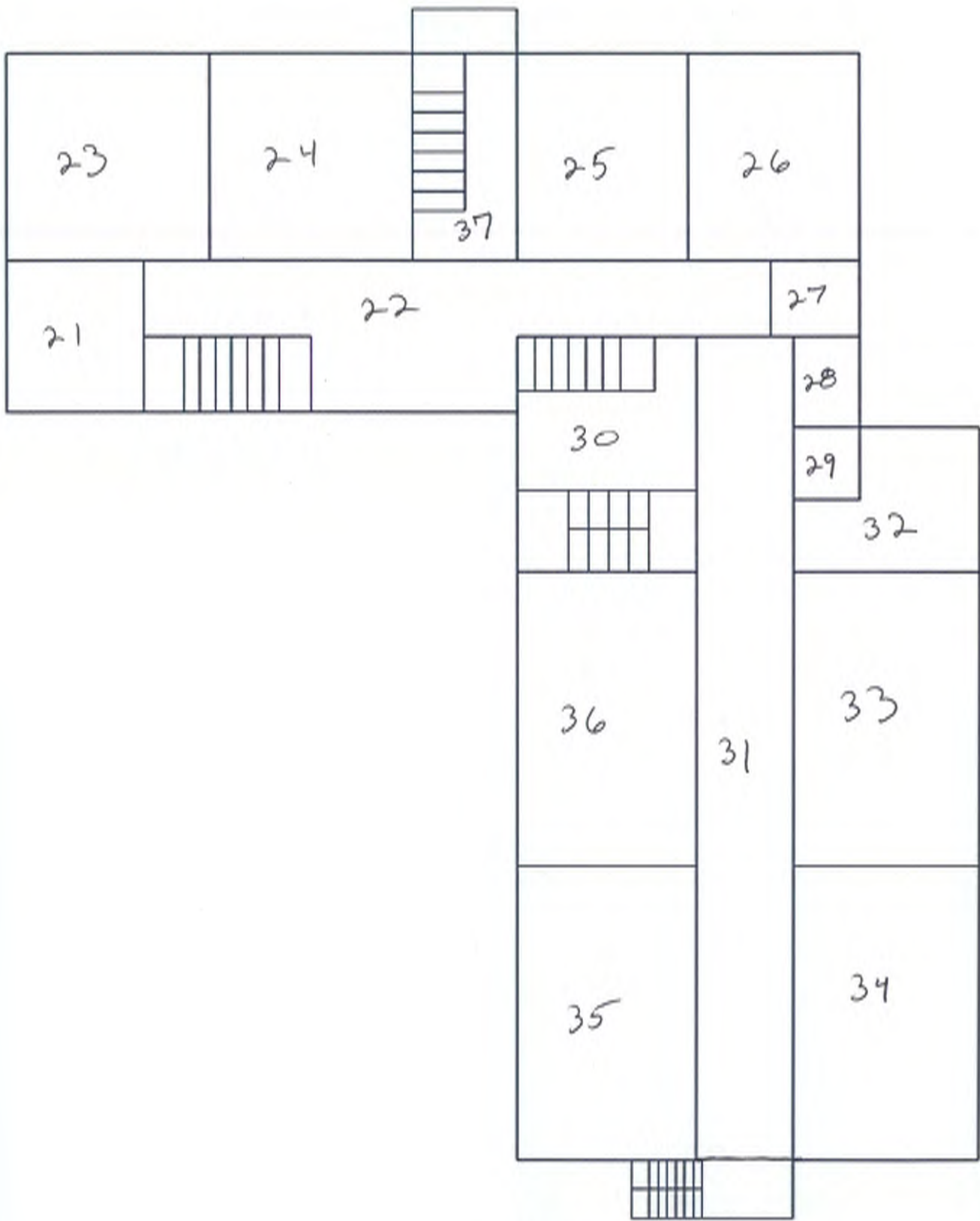
011402833

Appendix E

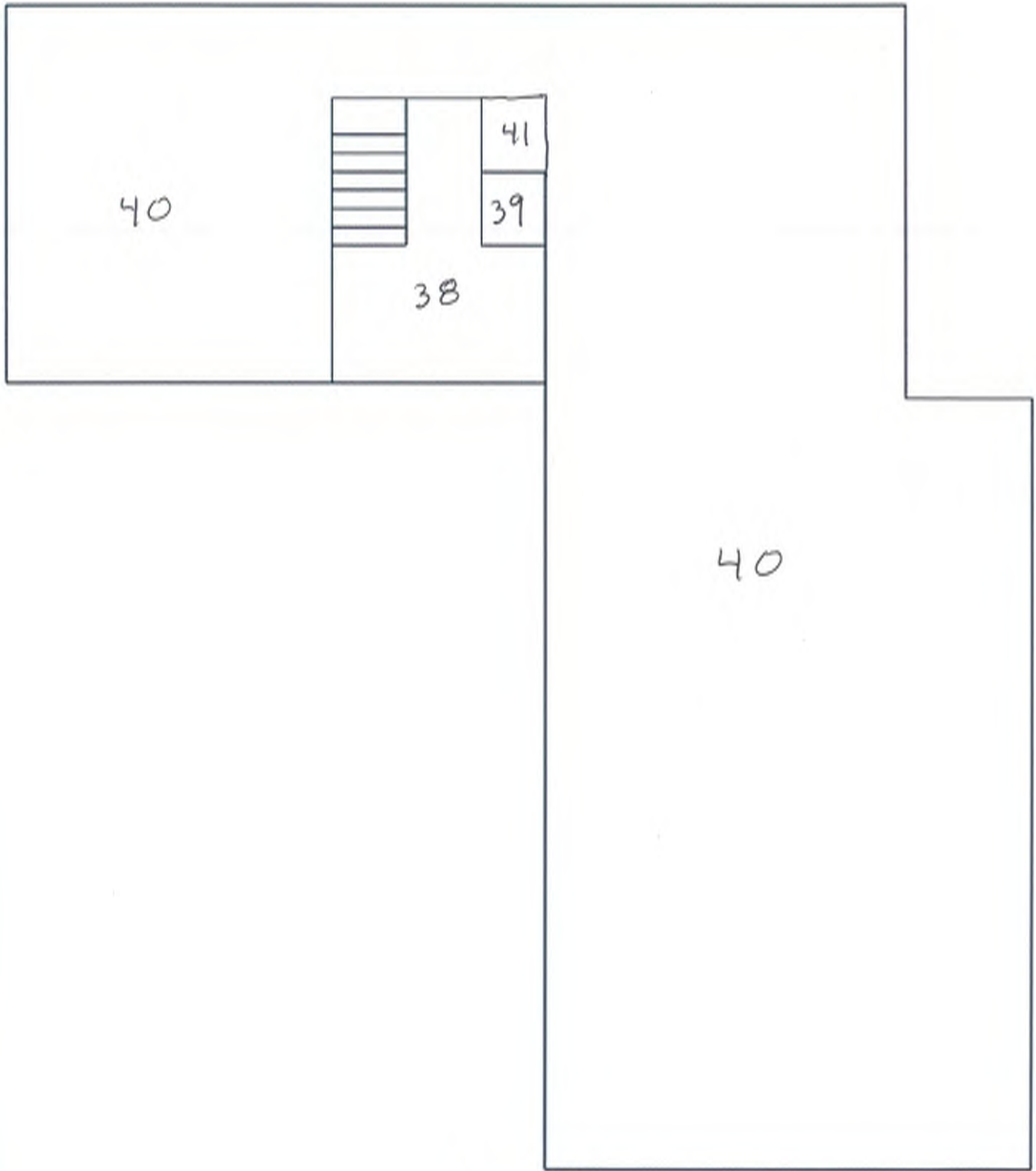
Building Diagrams



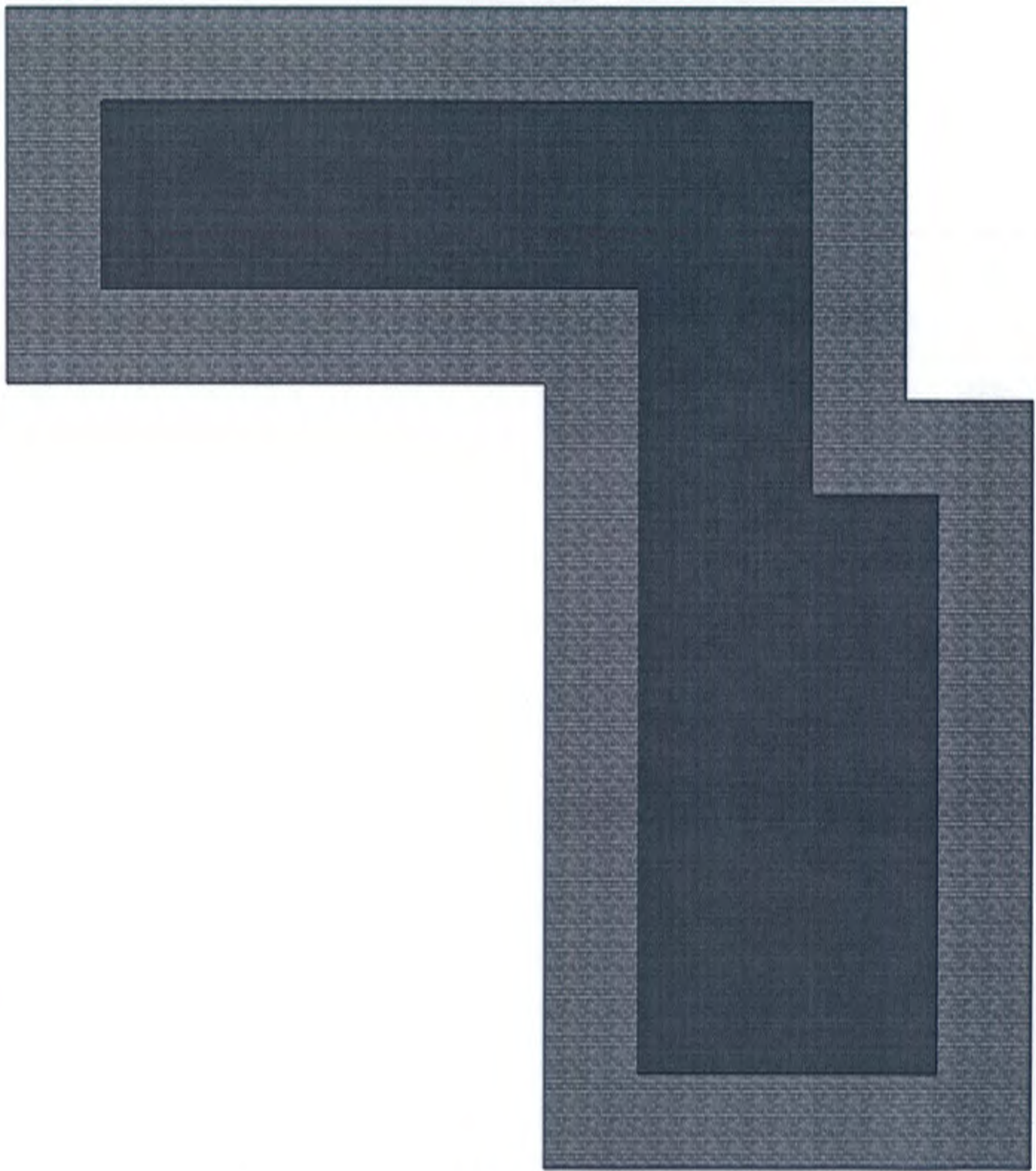
1st Floor



2nd Floor



3rd Floor



Roof

Supplemental Asbestos-Containing Building Materials Inspection Report

Former Osterville Bay Elementary School &
Osterville Community Center
West Bay Road
Osterville, Massachusetts

CBI Consulting, Inc.
Boston, Massachusetts

March 2017



FUSS & O'NEILL
EnviroScience, LLC

Fuss & O'Neill EnviroScience, LLC
50 Redfield Street, Suite 100
Boston, MA 02122



FUSS & O'NEILL
EnviroScience, LLC

March 31, 2017

Mr. Steven Watchorn
Project Manager
CBI Consulting, Inc.
250 Dorchester Avenue
Boston, MA 02127

**RE: Supplemental Asbestos-Containing Building Materials Inspection
Former Osterville Bay Elementary School & Osterville Community Center
West Bay Road, Osterville, Massachusetts**
Fuss & O'Neill EnviroScience, LLC No. 20140444.A2E

Dear Mr. Watchorn:

Enclosed is the supplemental asbestos-containing building materials inspection summary report for the supplemental inspection conducted at the former Osterville Bay Elementary School and the Osterville Community Center, both located on West Bay Road in Osterville, Massachusetts.

On December 22, 2016, a Fuss & O'Neill EnviroScience, LLC state-certified Asbestos Inspector performed a supplemental exploratory asbestos inspection prior to proposed building demolition activities.

The information summarized in this report is solely for the abovementioned materials only. The work was performed in accordance with our written scope of services revised November 28, 2016.

If you should have any questions regarding the contents of the enclosed report, please do not hesitate to contact me at 617-282-4675, extension 4703. Thank you for this opportunity to have served your environmental needs.

50 Redfield Street
Suite 100
Boston, MA
02122
t 617.282.4675
800.286.2469
f 617.282.8253

Sincerely,

Dustin A. Diedricksen
Senior Project Manager

www.fando.com

DD/so

Connecticut
Massachusetts
Rhode Island
South Carolina

Enclosure

Table of Contents

Supplemental Asbestos-Containing Building Materials Inspection Report Former Osterville Bay Elementary School & Osterville Community Center CBI Consulting, Inc.

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2. Asbestos-Containing Materials Inventory Summary

Appendices **End of Report**

APPENDIX A	LIMITATIONS
APPENDIX B	ENVIROSCIENCE ASBESTOS INSPECTOR STATE CERTIFICATION AND EPA ACCREDITATION
APPENDIX C	ASBESTOS LABORATORY ANALYTICAL REPORTS AND CHAIN-OF- CUSTODY FORM

1 Introduction

On December 22, 2016, Fuss & O'Neill EnviroScience, LLC (EnviroScience) representative, Mr. Jonathan Hand, performed a supplemental asbestos-containing building materials inspection for suspect concealed materials prior to proposed demolition activities to occur at the former Osterville Bay Elementary School & Osterville Community Center located on West Bay Road in Osterville, Massachusetts (the "Site").

EnviroScience previously conducted a hazardous building materials inspection at the Site, and the (August 12, 2014) report was utilized during this supplemental inspection.

1.1 Scope of Work

The work was performed for CBI Consulting, Inc. (the "Client") in accordance with our written scope of services revised November 28, 2016. This supplemental report is subject to the limitations presented in *Appendix A*. The scope of work included a supplemental asbestos-containing materials (ACM) inspection utilizing destructive investigative techniques at concealed locations.

Limited destructive investigations were performed (at the Client's request) during this supplemental inspection at the following concealed locations:

- Concealed Roofing Layers (to determine extent of slate roof tile cement);
- Through-Wall Flashing;
- Voids behind Brick Façades; and
- Underneath Flooring and Concrete Foundations (i.e., sub-slab coring).

EnviroScience did not conduct subsurface investigations to identify concealed suspect materials throughout the subject property.

We excluded collection and analysis of suspect materials for polychlorinated biphenyls (PCBs) during this inspection. Sampling for PCBs is presently not mandated by the United States Environmental Protection Agency (EPA); however, significant liability risk for disposing PCB-containing wastes exists. Recent knowledge of PCBs within these matrices has become more prevalent, especially with remediation contractors, waste haulers, and disposal facilities. Many property owners have become subject to large changes in schedule, scope, and costs as a result of failure to identify this possible contaminant prior to renovation or demolition activities.

1.2 Building Description

The former Osterville Bay Elementary School and the Osterville Community Center cumulatively contain approximately 23,700 square feet (SF) of total floor space. The inspection was limited to the two identified building structures listed below. The identification of material is based on individual homogenous sampling groups, which were separated by building age and construction type as follows:

- Former Osterville Bay Elementary School (18,700 SF two-story structure)
 - Original School Building (reportedly built in 1915)
 - Rear Addition (unknown construction date)
- Osterville Community Center (5,000 SF single-story recreational building; unknown construction date)

2 Supplemental Asbestos Inspection

A property owner must ensure that a thorough asbestos inspection is performed prior to possible disturbance of suspect ACM during renovation or demolition activities. This is a requirement of the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) regulation located at Title 40 CFR, Part 61, Subpart M.

On December 22, 2016, Mr. Hand of EnviroScience conducted a supplemental inspection at the aforementioned concealed locations. Mr. Hand is a Commonwealth of Massachusetts Department of Labor Standards (MADLS)-certified Asbestos Inspector. Refer to *Appendix B* for copies of the Asbestos Inspector's state certification and EPA accreditation.

2.1 Methodology

The inspection was conducted by visually inspecting for suspect ACM and touching each of the suspect materials. The suspect materials were categorized into three EPA NESHAP groups: friable and non-friable Category I and Category II type ACM.

- A Friable Material is defined as material that contains greater than one percent (> 1%) asbestos that, when dry, **can** be crumbled, pulverized, or reduced to powder by hand pressure.
- A Category I Non-Friable Material refers to material that contains > 1% asbestos (i.e., packings, gaskets, resilient floor coverings, and asphalt roofing products) that when dry **cannot** be crumbled, pulverized, or reduced to powder by hand pressure.
- A Category II Non-Friable Material refers to any non-friable material excluding Category I materials that contain > 1% asbestos that when dry **cannot** be crumbled, pulverized, or reduced to powder by hand pressure.

The suspect ACM were also categorized into their applications including, Thermal System Insulation (TSI), Surfacing ACM, and Miscellaneous ACM. TSI includes those materials used to prevent heat loss/gain or water condensation on mechanical systems. Examples of TSI include, but are not limited to, pipe insulation, boiler insulation, duct insulation, mudded pipe fitting insulation, etc. Surfacing ACM includes those ACM that are applied by spray, trowel, or otherwise applied to an existing surface. Surfacing ACM is commonly used for fireproofing, decorative, and acoustical applications. Miscellaneous ACM include those ACM not listed as thermal or surfacing, such as sheet flooring, floor tiles, ceiling tiles, caulking, mastics, construction adhesives, etc.

The EPA recommends collecting suspect ACM samples in a manner sufficient to determine asbestos content and to segregate each suspect type of homogenous (similar in color, texture, and date of application) materials. The EPA NESHAP regulation does not specifically identify a minimum number of samples to be collected for each homogeneous material, but the NESHAP regulation does recommend the use of sampling protocols included in EPA Title 40 CFR, Part 763, Subpart E: Asbestos Hazard Emergency Response Act (AHERA).

The EPA AHERA regulation requires a specific number of samples be collected based on the type of material and quantity present. This regulation includes the following protocol:

1. Surfacing Materials (i.e., plaster, spray-applied fireproofing, etc.) must be collected in a randomly distributed manner representing each homogenous area based on the overall quantity represented by the sampling as follows:
 - a. Three samples collected from each homogenous area that is less than or equal to 1,000 square feet.
 - b. Five samples collected from each homogenous area that is greater than 1,000 square feet but less than or equal to 5,000 square feet.
 - c. Seven samples collected from each homogenous area that is greater than 5,000 square feet.
2. Thermal System Insulation (i.e., pipe insulations, tank insulations, etc.) must be collected in a randomly distributed manner representing each homogenous area. Three samples must be collected from each material. Also, a minimum of one sample of any patching materials applied to TSI, presuming the patched area is less than six linear or square feet, should be collected.
3. Miscellaneous Materials (i.e., floor tile, gaskets, construction mastics, etc.) should have a minimum of two samples collected for each type of homogenous material. Sample collection was conducted in a manner sufficient to determine asbestos content of the homogenous material as determined by the inspector.

Suspect ACM samples were collected and proper chain-of-custody forms were prepared for transmission of collected samples to EMSL Analytical, Inc. (EMSL) for analysis. EMSL is a Commonwealth of Massachusetts-licensed and American Industrial Hygiene Association (AIHA)-accredited Asbestos Analytical Laboratory. Initial asbestos sample analysis was conducted using the EPA Interim Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116) via Polarized Light Microscopy with Dispersion Staining (PLM/DS).

The EPA recommends that non-friable, organically-bound (NOB) materials (e.g., asphaltic-based materials, adhesives, caulking, etc.) undergo further confirmatory analysis utilizing Transmission Electron Microscopy (TEM). One (1) of the collected NOB samples was analyzed by TEM.

2.2 Results

The EPA, the Occupational Safety and Health Administration (OSHA), and the MADLS, define a material that contains > 1% asbestos utilizing PLM/DS, as an ACM. The Massachusetts Department of Environmental Protection (MassDEP) further defines ACM as materials containing greater than or equal to (\geq) 1% asbestos. MassDEP also defines an asbestos-containing waste material (ACWM) as:

- ACM removed during renovation or demolition activities;
- Materials contaminated by an ACM during renovation or demolition activities; or
- ACM on and/or in facility components that are inoperable or have been taken out of service.

The MassDEP further defines waste material containing any amount of asbestos as an ACWM, which must be managed and disposed as such. Materials that are identified as “none detected” are specified as not containing asbestos.

Utilizing the EPA, OSHA, MADLS, and MassDEP protocol and criteria, the only newly-identified, asbestos-containing material discovered during this supplemental inspection (at concealed locations) was the roof flashing sealant at the former Osterville Bay School.

Refer to **Table 1**, attached hereto, for the complete list of ACM, ACWM, and non-ACM identified (from initial and supplemental inspections) by sample identification, material type, sample location, and asbestos content. Refer to **Table 2**, attached hereto, for the identified ACM inventory.

Refer to *Appendix C* for the asbestos laboratory analytical reports and chain-of-custody form.

2.3 Conclusions and Recommendations

Based on visual observations, sample collection, and laboratory analysis, ACM/ACWM were identified at the Site.

Dampproofing materials were not observed at exterior walls during this supplemental inspection. The original school building is solid brick, and the exterior walls at the rear addition consist of a (red) brick veneer overlaying tan, glazed bricks. The Osterville Community Center was determined to be hollow-core structural concrete masonry units filled with loose-fill expanded polystyrene insulation.

One sub-slab core was advanced in each homogenous area, and no suspect ACM were observed beneath the concrete slabs. Sub-slab coring was conducted at the following locations:

- Former Osterville Bay Elementary School
 - Original School Building at Boiler Room
 - Rear Addition at Hallway outside Cafeteria
- Osterville Community Center
 - Mechanical Room

Slate roof tiles (at the former Osterville Bay Elementary School) were removed from representative areas of the roofing field to determine the extent and estimated quantity of the (previously identified) asbestos-containing slate roof tile cement. Slate roof tile cement was observed at the following roof locations: bottom 3' from roof edge; top 1.5' nearer to flat roof; and 1.5' on each side of ridges and valleys.

Prior to disturbance, ACM/ACWM that would likely be impacted by the proposed demolition activities must first be abated by a MADLS-licensed Asbestos Abatement Contractor. This is a requirement of MADLS, MassDEP, and EPA NESHAP regulations governing asbestos abatement.

Due to the inability to effectively separate some types of multi-layered ACM (e.g., floor tile/mastic, gypsum board/joint compound, mastic/plywood, etc.) from non-ACM, these materials are considered asbestos-contaminated and must be managed as ACWM for removal and disposal purposes. This would include materials attached to the (black) roof flashing sealant.

If suspect materials should be encountered during demolition activities that are not identified in the inspection reports as being non-ACM, they should be assumed to be ACM until sample collection and laboratory analysis indicate otherwise.

This supplemental inspection report is not intended to be utilized as a bidding document or as a project specification document. The report is designed to aid the building owner, architect, construction manager, general contractors, and asbestos abatement contractors in locating ACM and ACWM.

Report prepared by Environmental Analyst, Jonathan Hand.

Reviewed by:



Dustin A. Diedricksen
Senior Project Manager

Tables

Table 1
Suspect Asbestos-Containing Materials Laboratory Analytical Data Summary

**Former Osterville Bay Elementary School & Osterville Community Center
Osterville, Massachusetts**

CBI Consulting, Inc.
March 2017

Fuss & O'Neill EnviroScience, LLC No. 20140444.A2E

Sample Number	Material Type	NESHAP Category	Sample Location	Result	Comments
1222-JH-001A	Black Through-Wall Flashing	Non-ACM	Osterville Bay Elementary School Addition Exterior	ND	TEM
1222-JH-001B	Black Through-Wall Flashing	Non-ACM	Osterville Bay Elementary School Addition Exterior	ND	
1222-JH-002A	Black Roof Flashing Sealant	Cat 2 NF	Osterville Bay Elementary School 1915 Building Roof	15% Chrysotile	
1222-JH-002B	Black Roof Flashing Sealant	Cat 2 NF	Osterville Bay Elementary School 1915 Building Roof	Pos Stop	

Cat 2 NF = Category II Non-Friable Material

Pos Stop = Positive Stop

ND = None Detected

ACM = Asbestos-Containing Material

TEM = Transmission Electron Microscopy

Table 2
Asbestos-Containing Materials Summary

**Former Osterville Bay Elementary School & Osterville Community Center
Osterville, Massachusetts**

CBI Consulting, Inc.
March 2017

Fuss & O'Neill EnviroScience, LLC No. 20140444.A2E

Material Type	Locations(s)	Asbestos Content	Estimated Total Quantity	Comments
Black Roof Flashing Sealant	Osterville Bay Elementary School 1915 Building Roof	15% Chrysotile	200 LF	
Slater's Mud (Slate Roof Tile Cement)	Osterville Bay Elementary School Roof	8% Chrysotile	3,500 SF	Was 8,350 SF for Entire Roof

LF = Linear Feet, SF = Square Feet

Appendix A

Limitations

APPENDIX A

Former Osterville Bay Elementary School & Osterville Community Center Osterville, Massachusetts

1. This environmental report has been prepared for the exclusive use of the Client, and is subject to, and is issued in connection with, the general terms and conditions of the revised Agreement (November 28, 2016) and all of its provisions. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and EnviroScience, shall be at the User's individual risk. This report should not be used as an abatement specification. All quantities of materials identified during this inspection are approximate.
2. EnviroScience has obtained and relied upon laboratory analytical results in conducting the inspection. This information was used to form conclusions regarding the types and quantities of ACM that must be managed prior to renovation or demolition activities that may disturb these materials at the subject property(ies). EnviroScience has not performed an independent review of the reliability of this laboratory data.
3. Unless otherwise noted, only suspect hazardous materials associated within or located on the building (aboveground) were included in this inspection. Suspect hazardous materials may exist below the ground surfaces that were not included in the scope of work of this inspection. EnviroScience cannot guarantee all asbestos or suspect hazardous materials were identified within the areas included in the scope of work.
4. The findings, observations, and conclusions presented in this report are limited by the scope of services outlined in our original Agreement, which reflects schedule and budgetary constraints imposed by the Client. Furthermore, the assessment has been conducted in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made.
5. The conclusions presented in this report are based solely upon information gathered by EnviroScience to date. Should further environmental or other relevant information be discovered at a later date, the Client should immediately bring the information to EnviroScience's attention. Based upon an evaluation and assessment of relevant information, EnviroScience may modify the report and its conclusions.

Appendix B

EnviroScience Asbestos Inspector State Certification and EPA Accreditation

Commonwealth of Massachusetts
Department of Labor Standards

William D. McKinney, Director



Asbestos Inspector

JONATHAN L. HAND

Eff. Date 02/29/16

Exp. Date 02/28/17

AID41945

Member of C.O.N.E.S.

BOSR BOS-RENEW

17



Certificate of Training

This program was presented at
Fuss & O'Neill Enviro Science in
Manchester, CT with the prior
approval of the CTDPH.

Awarded to

JONATHAN HAND

For successful completion of a 4 Hour, 1/2 Day
**Asbestos Building Inspector
Annual Refresher Training**
January 12, 2016

This training was approved and given in accordance with the
Regulations for Connecticut State Agencies
RCSA 20 - 440 - 1-9 and RCSA 20 - 441 and meets the
requirements of the EPA Revised MAP under TSCA Title II of 4/4/94.

Presented by

Mystic Air Quality Consultants, Inc.
1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: ABIRF24672

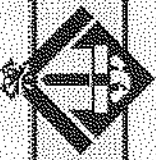
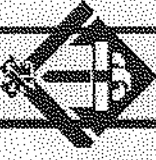
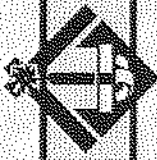
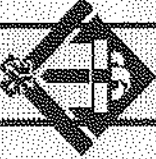
Exam Grade: 100

Exam Date: 01/12/2016

Expiration Date: 01/12/2017

[Signature]
Christopher J. Eident, CH, CSP, RS

[Signature]
George Williamson, Training Director
Richard Haffley, Training Director



Appendix C

Asbestos Laboratory Analytical Reports and Chain-of-Custody Form



EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / bostonlab@emsl.com

EMSL Order: 131606135
Customer ID: ENVI54
Customer PO: 20140444.A2E
Project ID:

Attention: Dustin Diedricksen
 Fuss & O'Neill EnviroScience, LLC
 146 Hartford Road
 Manchester, CT 06040

Phone: (617) 778-3750

Fax: (888) 838-1160

Received Date: 12/23/2016 11:37 AM

Analysis Date: 12/29/2016

Collected Date: 12/22/2016


Project: 20140444.A2E / Former West Bay School Demolition / Former Osterville Bay Elementary School, 99 West Bay Road

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1222-JH-001A <small>131606135-0001</small>	Exterior None - Black Through-Wall Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1222-JH-001B <small>131606135-0002</small>	Exterior None - Black Through-Wall Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1222-JH-002A <small>131606135-0003</small>	Roof None - Black Flashing Sealant	Black Fibrous Homogeneous		85% Non-fibrous (Other)	15% Chrysotile
1222-JH-002B <small>131606135-0004</small>	Roof None - Black Flashing Sealant				Positive Stop (Not Analyzed)

Analyst(s)

Michael Mink (3)



Steve Grise, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3, VT AL998919, Maine Bulk Asbestos BA039

Initial report from: 12/29/2016 10:26:35



EMSL Analytical, Inc.

5 Constitution Way, Unit A Woburn, MA 01801

Tel/Fax: (781) 933-8411 / (781) 933-8412

<http://www.EMSL.com> / bostonlab@emsl.com

EMSL Order: 131606135
Customer ID: ENVI54
Customer PO: 20140444.A2E
Project ID:

Attention: Dustin Diedricksen Fuss & O'Neill EnviroScience, LLC 146 Hartford Road Manchester, CT 06040	Phone: (617) 778-3750 Fax: (888) 838-1160 Received Date: 12/23/2016 11:37 AM Analysis Date: 01/04/2017 Collected Date: 12/22/2016
Project: 20140444.A2E / Former West Bay School Demolition / Former Osterville Bay Elementary School, 99 West Bay Road	

Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by TEM via EPA/600/R-93/116 Section 2.5.5.1

Sample ID	Description	Appearance	% Matrix Material	% Non-Asbestos Fibers	Asbestos Types
1222-JH-001A	Exterior None - Black	Black	100	None	No Asbestos Detected
131606135-0001	Through-Wall Flashing	Fibrous Heterogeneous			

Analyst(s)

Michael Mink (1)

Steve Grise, Laboratory Manager
or other approved signatory

This laboratory is not responsible for % asbestos in total sample when the residue only is submitted for analysis. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA

Initial report from: 01/04/2017 10:56:00



FUSS & O'NEILL
EnviroScience, LLC

Fuss O'Neill EnviroScience EMSL Customer No. ENV154

www.fando.com

50 Redfield Street, Suite 100, Boston, MA 02122

Phone (617) 282-4675 Fax (617) 282-8253

ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM

1482259889401

Project Name:	Former West Bay School Demolition	Project No.	20140444.A2E
Site Address:	Former Osterville Bay Elementary School, 99 West Bay Road	Project Manager:	Dustin Diedricksen
Building Name/Number:	Former West Bay School	Total # of Samples:	4

Sample ID	Material Type	Sample Location	Comments
1222JH-001A	Black Through-Wall Flashing	Exterior None	
1222JH-001B	Black Through-Wall Flashing	Exterior None	
1222JH-002A	Black Flashing Sealant	Roof None	
1222JH-002B	Black Flashing Sealant	Roof None	

Analysis Method: PLM EPA 600

Turnaround Time - 72 HOUR

Based on the turnaround time indicated above, analyses are due to EnviroScience on or before this date: _____ . Please call EnviroScience if analyses will not be completed for requested t/a/t at (617) 282-4675.

Email results to: ddiedricksen@fando.com

Do Not Mail Hard Copy Report

FAX Results to 888-838-1160.

Special Instructions: Stop analysis on first positive sample in each homogeneous set of samples unless otherwise noted. Do not layer samples unless indicated. Do not point count. If NOB group samples are all negative by PLM, analyze only the 'A' sample by TEM NOB unless you are told otherwise.

Samples Collected by:

Jon Hand

Date: 2016-12-21

Samples Sent by: *Jon Hand*

Date: 12/22/16

Time: PM

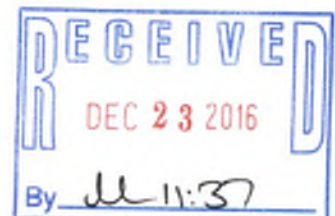
Samples Received by: _____

Date: _____

Time: _____

Shipped to: EMSL Boston

Method of Shipment: Fed Ex Lab Drop Off Other _____



EMSLFX 795219247360

DIVISION 02

EXISTING CONDITIONS

SECTION 02 82 13

ASBESTOS ABATEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 00 00 as part of this Section.
- B. Hazardous Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (August 12, 2014).
- C. Supplemental Asbestos-Containing Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (March 2017).
- D. Section 024100 - Demolition.
- E. Asbestos Abatement Drawings HA-01 - HA-06 prepared by Fuss & O'Neill EnviroScience, LLC.
- F. At a later time, a Non-Traditional Asbestos Abatement Work Practice (NTWP) Application may be prepared by a third-party, industrial hygiene firm and submitted to the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) for approval for work described herein.

1.02 SCOPE OF WORK

- A. Work outlined in this Section includes all work necessary for the removal, packaging, transporting, and disposing of asbestos-containing materials (ACM) and asbestos-containing waste materials (ACWM) impacted during demolition activities (the "Work") to occur at the former West Bay Elementary School and the Osterville Community Center located on West Bay Road in Osterville, Massachusetts (the "Site").
- B. All Work associated with the Osterville Community Center is part of Add Alternate 1.
- C. Work shall be performed by a MADLS-licensed Asbestos Abatement Contractor (the "Contractor") with certified Asbestos Workers and Supervisor(s). Training shall be in accordance with MADLS Regulation 453 CMR 6.00. Alternately, work involving the removal of non-friable, asphaltic roofing may be performed by workers with (minimum) 8-hour asbestos-awareness training specific to Category I non-friable, asbestos-containing, asphaltic roofing removal.

- D. This scope of work includes all necessary selective demolition to access ACM scheduled for abatement.
- E. Pursuant to MADLS Regulation 453 CMR 6.13(2)(a)(5), work operations that involve the breaking, shearing, or slicing of Category I non-friable, asbestos-containing, asphaltic roofing materials are not subject to the requirements of MADLS Regulation 453 CMR 6.00, as long as the work does not result in the production of asbestos dust or the material becoming friable.

1.03 PROJECT DESCRIPTION

- A. The Base Bid includes removal, packaging, transporting, and disposing ACM and ACWM, as identified herein, conducted by workers meeting the requirements of OSHA Title 29 CFR, Part 1926.1101 for Class I and II work. This shall include all necessary demolition to access ACM for abatement.
- B. Materials, as discovered outside of those listed (either above or below), will be measured and paid or credited by unit prices to be negotiated prior to commencement of the Work. The quantities are estimates only and should be field-verified by the Contractor.
- C. The following table summarizes the locations of the Base Bid work with estimated ACM quantities. Note quantities provided below are order-of-magnitude estimates only. Refer to the Demolition Drawings for specific locations.

BASE BID - ASBESTOS

MATERIAL TYPE	LOCATION	QUANTITY	NOTES
Former West Bay Elementary School			
Glue Daubs Associated with 1' x 1' Dot-Pattern Ceiling Tiles & Contaminated Debris	Rooms 025 - 031	4,500 SF	1
Pipe & Fitting Insulations	Rooms 002, 004, 006, 008, 009, 013, 015 - 019, & 021 - 029 & Concealed within Chases & above Fixed Ceilings	1,000 LF	
Flue Patching Compound	Room 013 (Boiler Room)	6 SF	
Speaker Box Mastic	Classrooms, Offices, Functional Spaces, & Corridors	25 EA @ 3 SF	

MATERIAL TYPE	LOCATION	QUANTITY	NOTES
Window Glazing Compound Associated with Interior Window Wall	Corridor 207	2 EA @ 4' x 8' 2 EA @ 10' x 8'	2
Sink Undercoating	Room 305	1 EA	
Slate Roof Tile Cement	Roof	3,500 SF	3
Exterior Window Caulking Associated with Aluminum Windows & Concealed Older Window Caulking (beneath Aluminum Frame)	Exterior	7 EA @ 5' x 5' 10 EA @ 3' x 5' 9 EA @ 5' x 3' 9 EA @ 5' x 6' 3 EA @ 4' x 9' 11 EA @ 5' x 8' 4 EA @ 20' x 8' 3 EA @ 3' x 6' 1 EA @ 2' x 4' 2 EA @ 6' x 8' 5 EA @ 15' x 8' Total = 64 EA	2
Interior/Exterior Door Caulking	Exterior Door Systems	325 LF	2
Residual Caulking on Wall	Exterior (outside Boiler Room)	40 LF	
Flashing Sealant	Roof	200 LF	
Add Alternate 1 - Osterville Community Center			
Sink Undercoating	Multi-Purpose Room	1 EA	
Interior/Exterior Window-Wall Caulking	Entryway	75 LF	2
Vertical Interior Expansion-Joint Caulking	Throughout Interior	150 LF	
Vertical Exterior Expansion-Joint Caulking	Exterior	150 LF	
Dampproofing Materials	Exterior Subgrade Foundation	550 SF	
Through-Wall Flashing	Exterior	400 SF	4
Window Glazing Compound Associated with Interior Windows	Office	2 EA @ 2' x 8' 2 EA @ 5' x 4'	2

EA = Each; LF = Linear Feet; SF = Square Feet

Notes:

- 1 Includes removal and disposal of all materials contaminated by deteriorated ACM as ACWM, including, but not limited to, ceiling tiles, ceiling grid, and debris.
- 2 Denotes whole-component window/door system removal and disposal as required for replacement including, but not limited to, concealed caulking, mastics/adhesives, and dampproofing materials.
- 3 Includes removal and disposal of all roofing layers down to existing roof deck as ACWM. Includes the bottom 3' and top 1.5' (nearer to flat roof), as well as 1.5' on each side of ridges and valleys.
- 4 Includes removal and disposal of masonry as ACWM to access and perform abatement.

D. A portion of the Work may be performed in multiple mobilizations, at different periods of time, in conjunction with other trades (i.e., other trades work, demolition work, etc.).

E. Safety Data Sheets (SDS) for chemicals to be used during the project must be submitted to the Consultant prior to chemicals being delivered to the Site.

F. Chemical strippers and/or encapsulants applied to any surface that will receive a new finish that requires an adhesive must be compatible with the application of the new finish. Coordination shall be made with the flooring installer for product/installation warranty (if applicable).

G. The Contractor shall be responsible for providing temporary water, power, and heat (as needed) at the Site to perform the Work. Temporary lighting within the work areas must be connected to ground-fault circuit interrupter (GFCI) power panels installed by a Commonwealth of Massachusetts-licensed electrician (permitted as required) and located outside of the work areas.

1.04 DEFINITIONS

A. The following definitions relative to asbestos abatement apply:

1. Abatement: Procedures to control fiber release from ACM; includes removal, encapsulation, and enclosure.
2. ACM: Asbestos-containing material(s).
3. Air Monitoring: The process of measuring the total airborne fiber concentration of an area or a person.
4. Amended Water: Water to which a surfactant (wetting agent) has been added.
5. Architect: CBI Consulting, Inc.
6. Asbestos: The name given to a number of naturally-occurring, fibrous silicates. This includes the serpentine and the amphiboles forms, and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically-altered.

7. Asbestos Abatement: Any activity to control fiber release from ACM; includes removal, encapsulation, enclosure, and repair.
8. Asbestos Abatement Project: All activities, including site preparation and clean-up, associated with asbestos abatement, from the time of initial arrival of the contractor on-site through obtaining an acceptable final clearance air sampling in the abatement areas(s) and/or removal of all abated ACM from the project site, whichever is later.
9. Asbestos-Containing Waste Material (ACWM): Any friable ACM removed during a demolition/renovation project and anything contaminated in the course of a demolition/renovation project including asbestos waste from control devices, bags or containers that previously contained asbestos, contaminated clothing, materials used to enclose the work area during the demolition/renovation operation, and demolition/renovation debris.
10. Asbestos Felt: A product made by saturating felted asbestos with asphalt, or other suitable bindery, such as a synthetic elastomer.
11. Asbestos Fibers: Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.
12. Asbestos Project Designer: The MADLS-certified Asbestos Project Designer for this project is Mr. Dustin A. Diedricksen (Certification No. AD000037).
13. Asbestos Supervisor: Any employee of a MADLS-licensed Asbestos Abatement Contractor who possesses a valid MADLS certification and EPA accreditation as an Asbestos Supervisor.
14. Asbestos Work Area: A regulated area, as defined by OSHA Title 29 CFR, Part 1926.1101, where asbestos abatement operations are performed, which is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated areas for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
15. Asbestos Worker: Any employee of a MADLS-licensed Asbestos Abatement Contractor who possesses a valid MADLS certification and EPA accreditation as an Asbestos Worker.
16. Caulking: Resilient mastic compound often having a silicone bituminous or rubber base; used to seal cracks, fill joints, and prevent leakage.
17. Clean Room: An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of worker street clothes and protective equipment.

18. Competent Person: As defined by OSHA Title 29 CFR, Part 1926.1101, a Site representative who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. The Competent Person has authority to take prompt corrective measures and to eliminate such hazards during asbestos removal. The Competent Person shall be properly trained in accordance with EPA's Model Accreditation Plan (MAP).
19. Consultant: Fuss and O'Neill EnviroScience, LLC.
20. Containment: An enclosure which surrounds the location where ACM and/or other toxic or hazardous substance removal is conducted, and establishes a controlled work area.
21. Contractor: Any person, firm, corporation, or other entity who has a valid Asbestos Abatement Contractor license issued by MADLS for the purpose of entering into, or engaging in, asbestos abatement work.
22. Curtained Doorway: A device to allow ingress and egress from one area to another while permitting minimal air movement between the areas. Two curtained doorways spaced a minimum of three feet apart can form an airlock.
23. Dampproofing: Application of water-impervious materials to a surface (such as a wall) to prevent penetration of moisture, typically associated with below-grade surfaces and veneers.
24. Decontamination Enclosure System (Decon): A series of connected areas, with curtained doorways between adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
25. Encapsulant: A liquid material which can be applied to ACM, that controls the possible release of asbestos fibers either by creating a membrane over the surface (bridging encapsulant), or penetrating the material and binding its components together (penetrating encapsulant).
26. EPA: The United States Environmental Protection Agency.
27. Equipment Room: Any contaminated area or a room that is part of the worker decon with provisions for storage of contaminated clothing and equipment.
28. Fixed Object: Unit of equipment or furniture in the work areas that cannot be removed from the work area.
29. Friable ACM: Any material that contains greater than one percent (> 1%) asbestos as determined using the method specified in Title 40 CFR, Part 763, Appendix A, Subpart F, Section 1, via PLM, or is presumed to contain asbestos, that can be crumbled, pulverized, or reduced to powder by hand pressure (when dry).
30. Glazing Compound: Any compound used to hold glass in-place, also referred to as glazing putty.

31. HEPA Filter: High-Efficiency Particulate Air (HEPA) filter in compliance with ANSI Z9.2 1979.
32. HEPA-Filtered Work Area Ventilation System: A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.
33. HEPA-Vacuum Equipment: Vacuum equipment where all the air drawn into the machine is expelled through a HEPA filter with none of the air leaking past it and with a HEPA-filter as the last filtration stage.
34. MADLS: The Commonwealth of Massachusetts Department of Labor Standards.
35. MassDEP: The Commonwealth of Massachusetts Department of Environmental Protection.
36. Movable Object: Unit of equipment of furniture in the work area that can be removed from the work area.
37. NESHAP: National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.
38. Non-Friable ACM: Any material that contains > 1% asbestos as determined using the method specified in EPA Title 40 CFR, Part 763, Appendix A, Subpart F, Section 1, via PLM, or is presumed to contain asbestos, that cannot be crumbled, pulverized, or reduced to powder by hand pressure (when dry).
39. NPE: Negative Pressure Enclosure.
40. OSHA: The Occupational Safety and Health Administration.
41. Owner: Town of Barnstable.
42. Permissible Exposure Limit (PEL): The maximum total airborne fiber concentration to which an employee is allowed to be exposed. The new limit established by OSHA Title 29 CFR, Part 1926.1101 is 0.1 fibers/cc as an eight (8)-hour time-weighted average (TWA), and 1.0 fibers/cc averaged over a sampling period of thirty (30) minutes as an Excursion Limit. The Contractor shall be responsible for maintaining work areas in a manner that this standard is not exceeded.
43. Project Monitor: A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or a Consultant with experience in asbestos air monitoring, personal protection equipment, and abatement procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.
44. RCRA: The Resource Conservation and Recovery Act (EPA Title 40 CFR, Parts 260 - 265).

45. Regulated Area: An area established by the employer to demarcate where Class I, II, and III asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate, and a work area, within which, total airborne fiber concentrations exceed, or there is a reasonable possibility that they may exceed, the PEL.
46. Shower Room: A room between the Clean Room and the Equipment Room in the decon with hot and cold running water suitably arranged for employee showering during decontamination. The Shower Room is located in an airlock between the contaminated area and the clean area.
47. Site: The former West Bay Elementary School and Osterville Community Center located on West Bay Road in Osterville, Massachusetts.
48. Surfactant: A chemical wetting agent added to water to improve penetration into ACM.
49. Totally-Enclosed Manner: A manner that will ensure no exposure of human beings or the environment to a concentration of asbestos.
50. Transport Vehicle: A motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (e.g., trailer, railroad freight car) is a separate transport vehicle.
51. TWA: Time-Weighted Average.
52. Waterproofing: Material, usually a membrane or applied compound (tar/mastic), used to make a surface impervious to water, includes concealed conditions (applications around doors, windows, and in wall cavities). Sometimes combined with felts.

1.05 CONSULTANT

- A. The Owner/Architect shall retain a third-party, industrial hygiene firm (the "Consultant") for the purposes of project management and monitoring during Asbestos Abatement activities. At the discretion of the Owner/Architect, the Consultant will represent the aforementioned during the abatement project. The Contractor will regard the Consultant's direction as authoritative and binding, as provided herein, in matters particularly, but not limited to the following:
 1. Work area approval.
 2. Monitoring results review.
 3. Completion of the various work segments.
 4. Final abatement completion.
 5. Data submission.
 6. Daily field punch list items.
- B. The Commonwealth of Massachusetts Department of Labor Standards (MADLS) Asbestos Consultant - Project Designer for this Asbestos Abatement Project is Mr. Dustin A. Diedricksen (Certification No. AD000037).

1.06 USE OF THE CONTRACT DOCUMENTS

- A. It shall be incumbent upon the Contractor to visit the Site and determine what exists, its condition, and what will be required to accomplish the Work intended by the Contract Documents. No increase in the Contract Sum will be permitted as a result of the Contractor's failure to visit the Site and understand the existing conditions.
- B. All work shall comply with the Contract Documents and with applicable codes, laws, regulations, and ordinances wherever applicable. The most stringent of all the foregoing shall govern the Work.
- C. It is not intended that this Section show every detail of the Work, but the Contractor shall be required to furnish, within the Contract Sum, all material and labor necessary for the completion of the Work in accordance with the intent of this Section.
- D. In case of ambiguity among the Contract Documents, the more stringent requirement, as determined by the Consultant, shall prevail.
- E. The Work includes making modifications as necessary, subject to approval by Owner in consultation with the Consultant, to correct any conflicts.
- F. All items not specifically mentioned in the Contract Documents, but implied by trade practices to complete the Work, shall be included.

1.07 SITE EXAMINATION

- A. It is understood that the Contractor has examined the Site and made their own estimates of the facilities and difficulties attending the execution of the Work and has based their price thereon.
- B. Except for unforeseeable concealed conditions as determined by the Consultant, the Contractor shall make no claim for additional cost due to the existing conditions at the Site.

1.08 CONTRACTOR QUALIFICATIONS

- A. The Contractor shall submit a record of prior experience in asbestos abatement projects, listing no less than three completed projects in the past year of similar size and scope. The Contractor shall list the experience and training of the Asbestos Supervisor and the Asbestos Abatement Workers. The information that should be included is as follows:

1. Project Name and Address
 2. Owner's Name and Address
 3. Architect's Name
 4. Consultant's Name
 5. Contract Amount
 6. Date of Completion
 7. Extras and Changes
- B. The Contractor selected must currently hold a valid MADLS Asbestos Abatement Contractor license.
- C. Submit a written statement regarding whether the Contractor has ever been cited for non-compliance with federal, state, or local asbestos regulations pertaining to worker protection, removal, transport, or disposal.

1.09 ADDITIONAL GENERAL REQUIREMENTS

- A. The Contractor shall employ a competent, MADLS-certified Asbestos Abatement Supervisor with at least three years of experience on projects of similar scope and magnitude, who shall be responsible for all work involving asbestos abatement as described in the Contract Documents and defined in applicable regulations and have full-time, daily supervision of the same. The Supervisor shall be the competent person as defined by Occupational Safety and Health Administration (OSHA) regulations.
- B. If required by federal, state, local, or any other authorities having jurisdiction over such work, the Contractor shall allow the Work of this contract to be inspected. The Contractor shall immediately notify the Owner, Architect, and Consultant and shall maintain written evidence of such inspection for review by the aforementioned parties.
- C. The Contractor shall incur the cost of all fines resulting from regulatory non-compliance as issued by federal, state, and local agencies. The Contractor shall incur the cost of all work requirements mandated by federal, state, and local agencies as a result of regulatory non-compliance or negligence.
- D. The Contractor shall immediately notify the Owner, Architect, and Consultant of the delivery of all permits, licenses, certificates of inspection, of approval, or of occupancy, etc., and any other such instruments required under codes by authorities having jurisdiction, regardless of who issued, and shall cause them to be displayed to the aforementioned parties for verification and recording.

1.10 SUBMITTALS

- A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting and at least ten (10) business days before the start of the Work:
1. Submit a schedule to the Owner/Architect and the Consultant that defines a timetable for executing and completing the project, including work area preparations, removal, cleanup, decontamination, and final clearance air monitoring (if applicable).
 2. Submit copies of all notifications, permits, applications, licenses and like documents required by federal, state, or local regulations obtained or submitted in proper fashion. The Contractor's supervisor and laboratory information (Fuss & O'Neill EnviroScience, LLC - AA000198) submitted on Asbestos Notification Form (ANF-001) must be accurate or a revision will be required.
 3. Submit the name and address of the hauling contractor and the landfill to be used. Also, submit current, valid operating permits and certificates of insurance for the transporter and landfill.
 4. Submit photographic or video documentation showing the building conditions prior to the start of work. The Contractor shall be held responsible for all damage to the building and its contents not shown on the pre-construction documentation. The Contractor shall note if this does not apply since the documentation was collected by others (i.e., General Contractor).
 5. Submit a detailed, site-specific work plan including, but not limited to, decon construction, work area isolation, and removal methods.
 6. Submit the training, medical, and respirator fit test records as well as a current, valid MADLS certification of each employee who may be on the Site.
 7. If the Contractor's MADLS-certified Asbestos Abatement Supervisor is not conducting OSHA-required employee exposure monitoring, submit the name, address, and qualifications of the air sampling professional that the Contractor proposes to use on this project for this task. The Contractor shall note if this does not apply.
 8. Submit the name, address, and qualifications of proposed laboratories intended to be utilized for Contractor personal air sampling analysis as required by this Section.
 9. Submit detailed product information on all materials and equipment proposed for asbestos abatement work on this project. This includes all SDS for products and chemicals that may be used on the project.
 10. Submit pertinent information regarding the qualifications of the Project Supervisor (competent person) for this project, as well as a list of past projects completed.

11. Submit a chain-of-command for the project. The chain-of-command should include the name, title, and contact number for each person listed.
12. Submit a site-specific Emergency Action Plan for the project. The Emergency Action Plan may include emergency procedures to be followed by Contractor personnel to evacuate the building, hospital name and phone number, most direct transportation route from the Site, emergency telephone numbers, etc. If this information is contained within an Emergency Action Plan prepared by the Site's General Contractor, a copy shall be submitted for review.
13. Submit a written, site-specific Respiratory Protection Program for employees undertaking the Work, including make, model, and National Institute of Occupational Safety and Health (NIOSH) approval numbers of respirators to be used at the Site. The Contractor shall note if the Respiratory Protection Program is not required at the Site and why.
14. Submit the proposed electrical safeguards to be implemented by a Commonwealth of Massachusetts-licensed electrician, including but not limited to: location of transformers, GFCI outlets, lighting, and power panels necessary to safely perform the Work, including a description of electrical hazards and a safety plan for common practices in the work area. This may also include a safety plan for temporary lighting, extension cords, and other powered equipment used in the work area (locations, daily inspections, etc.).
15. Submit the proposed worker orientation plan that, at a minimum, includes a description of asbestos hazards and abatement methodologies, a review of worker protection requirements, and the outline of safety procedures.

No work on the Site will be allowed to begin until the Owner/Architect and the Consultant approve the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation in a timely manner does not constitute a cause for change order or a time extension.

- B. The Contractor shall submit the following to the Consultant during the Work:
 1. Copies of training, MADLS certifications, respirator fit test records, and medical records for new employees to start work 24 hours in advance of the new employee arriving at the Site.
- C. The Contractor shall submit the following to the Owner at the completion of the Work. The Owner reserves the right to retain payment(s) until all items are received in completion:
 1. Original final completed copies of the WSR, signed by all transporters and the designated disposal site owner/operator.

2. Original final completed copies of weight tickets, recycling tickets, and manifests for all specified materials.
3. Contractor's logs (daily activity logs, daily sign in sheets, containment sign-in sheets), and all worker training, MADLS certifications, medical records, and respirator fit test records.
4. Copies of all OSHA personal monitoring results.

1.11 REGULATIONS AND STANDARDS

A. The Contractor shall be solely responsible for conducting this project and supervising all work in a manner that will be in conformance with all federal, state, and local regulations and guidelines pertaining to asbestos abatement. Specifically, the Contractor shall comply with the requirements of the following:

1. EPA National Emissions Standards for Hazardous Air Pollutants (NESHAP) Regulations (Title 40 CFR, Part 61, Subpart M).
2. EPA Asbestos Hazards Emergency Response Act (AHERA) Regulations (Title 40 CFR, Part 763, Subpart E).
3. OSHA Asbestos Regulations (Title 29 CFR, Parts 1910.1001 and 1926.1101).
4. Department of Transportation (DOT) Hazardous Waste Transportation Regulations (Title 49 CFR, Parts 170 - 180).
5. MassDEP Asbestos Regulations (310 CMR 7.00 and 7.15).
6. MADLS "The Removal, Containment or Encapsulation of Asbestos" Standards for Asbestos Abatement (453 CMR 6.00).
7. Life Safety Code, National Fire Protection Association (NFPA).
8. Local health and safety codes, ordinances or regulations pertaining to asbestos remediation and all national codes and standards including American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), and Underwriter's Laboratories (UL).

1.12 EXEMPTIONS

A. Any deviations from the Contract Documents require the written approval and authorization from the Owner and Consultant. Any deviations that may impact the bid cost shall be delineated with the bid for the Owner to review.

- B. Any modifications from the standard work practices identified in MADLS Regulations 453 CMR 6.00 or MassDEP Regulations 310 CMR 7.00 and 7.15 must be requested in writing and approved in writing by both regulatory agencies. The Consultant shall develop a Non-Traditional Asbestos Abatement Work Practice (NTWP) on behalf of the Owner. If the Contractor intends to request a NTWP for this project, the nature of the NTWP shall be disclosed in the Bid Documents, and the cost savings associated with said NTWP shall be provided for Owner's consideration. A NTWP shall not be filed without prior Owner and Consultant approval.

1.13 FINAL RE-OCCUPANCY AIR CLEARANCE

- A. Following the completion of the encapsulation phase of the Work, the Consultant shall collect final re-occupancy clearance air samples inside the negative pressure enclosure (NPE) work area per MADLS regulatory requirements for re-occupancy.
- B. The Owner shall be responsible for payment of the sampling and analysis of the initial final clearance air samples only. If the first set of samples fails to satisfy the re-occupancy criteria, the Contractor shall be responsible for payment of all costs associated with the collection and analysis of additional final clearance air samples.
- C. The Contractor shall not conduct demolition or other removal activities during final clearance air sampling for re-occupancy.
- D. Exterior asbestos abatement work: Re-occupancy clearance air sampling is not required following removal if abatement activities fall under MassDEP Regulation 310 CMR 7.15(10), (11), or (12) and NPEs are not utilized. If abatement activities would render non-friable ACM friable, the Work must be performed within a NPE and final re-occupancy air clearance sampling will be conducted.

1.14 NOTIFICATIONS, POSTINGS, SUBMITTALS, AND PERMITS

- A. The Contractor shall make the following notifications and provide the submittals to the following agencies prior to the start of work. Submissions may be made electronically on eDEP File. This notification is required ten (10) calendar days prior to the start of the abatement project. The supervisor and laboratory information (Fuss & O'Neill EnviroScience, LLC - AA000198) submitted on the form must be accurate or a revision will be required.

1. Commonwealth of Massachusetts Department of Environmental Protection
Asbestos Program
Enforcement Division
P.O. Box 4062
Boston, MA 02211
 2. Commonwealth of Massachusetts Department of Labor Standards
19 Staniford Street, 2nd Floor
Boston, MA 02114
- B. The minimum information included in the notification to these agencies includes:
1. Building Owner/Operator Name and address.
 2. Building location.
 3. Building size, age, and use.
 4. Amount of asbestos to be removed.
 5. Asbestos Abatement Supervisor Name and Certification Number.
 6. Laboratory Analytical Name and License Number.
 7. Work schedule, including proposed start and completion date.
 8. Asbestos removal procedures to be used.
 9. Name and location of disposal site for generated asbestos waste, residue, and debris.

1.15 WORK SITE SAFETY PLAN

- A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the Site. The safety plan should include provisions for the following:
1. Injured worker evacuation.
 2. Emergency and fire exit routes from all work areas.
 3. Emergency first aid treatment.
 4. Local telephone numbers for emergency services including ambulance, fire, and police.
 5. A method to notify building occupants in the event of a fire or other emergency requiring building evacuation.
- B. The Contractor shall be responsible for training all workers in these procedures.

1.16 INDEPENDENT AIR SAMPLING AND ASBESTOS ABATEMENT MONITORING

- A. This Subsection describes independent air sampling work being performed on behalf of, and paid for by, the Owner. This Subsection describes air monitoring conducted by the Consultant to verify that the building, beyond the work area, and the outside environment remains uncontaminated. Personal air monitoring required by OSHA is work to be performed by the Contractor and is within the Contract Sum. A negative exposure assessment will not be reviewed and/or approved by the Consultant; it shall be the Contractor's responsibility to determine its validity.
- B. The purpose of the Consultant's air monitoring is to verify proper engineering controls in the work areas including, but not limited to:
1. Building contamination outside the work area by airborne fibers.
 2. Filtration failure or differential pressure system rupture.
 3. Air contamination outside the building envelope by airborne fibers.
- C. If any of the above occurs, the Contractor shall immediately cease Asbestos Abatement activities until the fault is made correct. Do not recommence work until authorized by the Consultant.
- D. The Consultant may monitor total airborne fiber concentrations outside the work area. The purpose of this air monitoring will be to detect total airborne fiber concentrations outside the NPE, which may challenge the effectiveness of the work area isolation procedures to protect the ambient areas inside and at the exterior of the Site.
- E. To determine if the elevated total airborne fiber concentrations encountered during abatement operations have been reduced to an acceptable level, the Consultant will sample and analyze ambient air in accordance with final clearance air sampling requirements.
- F. The Consultant may perform on-site monitoring throughout the project, as follows:
1. All work procedures may be monitored by the Consultant to assure that areas outside the designated work areas will not be contaminated.
 2. Prior to work on any given day, the Contractor's designated "competent person" shall discuss the day's work schedule with the Consultant to evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the Site or the employees. This includes a visual inspection of the work area and the decon.

1.17 CONTRACTOR'S AIR SAMPLING RESPONSIBILITY

- A. The Contractor shall independently retain an air-sampling professional or the MADLS-certified Asbestos Abatement Supervisor shall monitor total airborne fiber concentrations in the worker breathing zones to establish conditions and work procedures for maintaining compliance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.
- B. The Contractor's air sampling professional shall document all air sampling results and provide a report to the Consultant within 48 hours after sample collection.
- C. All air sampling shall be conducted in accordance with methods described in OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.

1.18 PROPER WORKER PROTECTION

- A. This Subsection describes the equipment and procedures required for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.
- B. All workers are to be accredited as Abatement Workers as required by the EPA AHERA Title 40 CFR, Parts 763 Appendix C to Subpart E, February 3, 1994.
- C. The Contractor is required to be certified and accredited as required by MADLS.
- D. In accordance with OSHA Title 29 CFR, Part 1926, all workers shall receive a training course covering the dangers inherent in handling asbestos, the dangers of breathing asbestos dust, proper work procedures, and proper worker protective measures. This course must include, but is not limited to the following:
 - 1. Methods of recognizing asbestos
 - 2. Health effects associated with asbestos
 - 3. Relationship between smoking and asbestos in producing lung cancer
 - 4. Nature of operations that could result in exposure to asbestos
 - 5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
 - a. Engineering controls
 - b. Work Practices
 - c. Respirators
 - d. Housekeeping procedures
 - e. Hygiene facilities
 - f. Protective clothing
 - g. Decontamination procedures
 - h. Emergency procedures

- i. Waste disposal procedures
 6. Purpose, proper use, fitting, instructions, and limitations of respirators as required by OSHA Title 29 CFR, Part 1910.134
 7. Appropriate work practices for the work
 8. Requirements of medical surveillance program
 9. Review of OSHA Title 29 CFR, Part 1926
 10. Pressure Differential Systems
 11. Work practices including hands on or on job training
 12. Personal Decontamination procedures
 13. Air monitoring, personal and area
- E. The Contractor shall provide medical examinations for all workers who may encounter a total airborne fiber concentration of 0.1 fibers/cc or greater for an 8-hour TWA. In the absence of specific airborne fiber data, provide medical examinations for all workers who will enter the work area for any reason. Examination shall, at a minimum, meet OSHA requirements as set forth in Title 29 CFR, Part 1926. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.
- F. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:
 1. Non-essential personnel are prohibited from entering the work area.
 2. All authorized personnel entering the work area shall read the "Worker Protection Procedures" that are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing.
 3. All personnel who are exiting from the decon shall be properly decontaminated.
 4. Asbestos waste that is removed from the work area must be properly bagged and labeled in accordance with these Specifications. Asbestos waste removed from a NPE must be immediately transported off-site or immediately placed in locked, posted temporary storage on-site, and removed within 24 hours of the project conclusion.
 5. Any materials, equipment, or supplies that are removed from the decon shall be thoroughly cleaned and decontaminated by wet-cleaning methods and/or HEPA vacuuming of all surfaces.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Deliver all materials in the original packages, containers, or bundles bearing the brand name, manufacturer name, and product technical description.

- B. The Contractor shall have a sufficient inventory of, or dated purchase orders for, materials necessary for the Work (e.g., protective clothing, respirators, respirator filter cartridges, polyethylene (poly) sheeting of proper size and thickness, tape, spray adhesive, air filters, etc.).
- C. Damaged or deteriorating materials are not permitted for use and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed as ACWM.
- D. Poly sheeting (packaged in a roll to minimize the frequency of joints) shall be delivered to the Site with factory label indicating four (4) or six (6)-mil thickness.
- E. Poly disposable bags shall be 6-mil with OSHA-required pre-printed labels (OSHA Title 29 CFR, Part 1926.1101(k)(8)(iii)).
- F. Tape or adhesive spray shall be capable of sealing joints in adjacent poly sheeting, and shall be able to attach poly sheeting to finished or unfinished surfaces of dissimilar materials. Tape and adhesive spray shall also be capable of adhering under both dry and wet conditions (including use of amended water).
- G. Surfactant (wetting agent) shall consist of fifty percent (50%) polyoxyethylene ether and 50% polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of 1 ounce surfactant to 5 gallons of water, or as directed by manufacturer.
- H. Removal encapsulant shall be non-flammable, factory-prepared penetrating chemical encapsulant deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.
- I. The Contractor shall have spray equipment capable of mixing wetting agent with water. Spray equipment shall be capable of generating sufficient pressure and volume; the hose length must reach all areas within the work area.
- J. Impermeable containers shall be used to receive and retain any asbestos-containing or contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with OSHA Title 29 CFR, Part 1926.1101(k)(8)(iii) [June 1, 2015 requirements]. Containers must be airtight and watertight.
- K. Labels and signs, as required by OSHA Title 29 CFR, Part 1926.1101, will be used.
- L. Encapsulant shall be bridging or penetrating type which has been deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

2.02 TOOLS AND EQUIPMENT

- A. The Contractor shall provide all clean tools and equipment necessary for asbestos removal, encapsulation, and enclosure.
- B. The Contractor's air monitoring professional or Abatement Supervisor shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements. The equipment shall function properly and air samples shall be calibrated with a recently calibrated (within 6 calendar months) rotometer.
- C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the Work, including protective clothing, respirators, respirator filter cartridges, poly sheeting of proper size and thickness, tape, spray adhesive, and air filters.
- D. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and/or electrical power sources (e.g., generators, etc.). Any electrical-connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, permitted as required.
- E. The Contractor shall be responsible for coordinating electrical and water services, and shall pay for these services for the duration of the project (if applicable).
- F. The Contractor shall assist the Consultant by providing necessary tools and equipment (e.g., coveralls, ladders, extension cords, lighting, etc.) for the Consultant to perform project monitoring activities (e.g., final visual inspection(s), in-progress and final clearance air sampling, etc.). The Consultant reserves the right to reject such items that are deemed unsafe and/or do not function properly, and may request items be replaced with adequate replacements. The work areas must be safe to enter/occupy by the Consultant at all times.
- G. The Contractor shall have available shower stalls and plumbing, including sufficient hose length and drain system, or an acceptable alternate.

- H. The HEPA-filtered work area ventilation systems shall contain HEPA filter(s) and be capable of sustaining sufficient air exhaust to create a minimum negative air pressure of -0.02 inches of water column within NPE with respect to the outside area. Digital monometers shall be supplied for Class 1 work. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of 4 air changes per hour within the NPE. No air movement system or air-filtering equipment shall discharge unfiltered air outside the work area. The Contractor will have reserve units so that system will operate continuously.
- I. HEPA-Vacuum Equipment, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

- A. A pre-construction meeting may be scheduled prior to the start of Work. The Contractor must attend this meeting (as required by the Owner); the assigned Asbestos Abatement Supervisor must also attend this meeting.
- B. The Contractor shall present a detailed project schedule and project submittals at the pre-construction meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and the Consultant will inform the Contractor of any scheduling adjustments for this project.
- C. Following the pre-construction meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.02 WORK AREA PREPARATION - NEGATIVE PRESSURE ENCLOSURE (NPE)

- A. Where necessary, deactivate electrical power, including receptacles and light fixtures. Under no circumstances during the decontamination procedures will lighting fixtures be permitted to be operating when amended water spray may contact the fixture. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a Commonwealth of Massachusetts-licensed electrician (permitted as required) and located outside the work areas.
- B. Temporary power shall be continuous power. Portable generators are not authorized for use during interior asbestos abatement without an approved NTWP.

- C. HEPA-filtered work area ventilation systems shall be utilized during the installation of enclosures and supports where ACM may be disturbed.
- D. Deactivate and/or isolate heating, ventilating, and air conditioning (HVAC) systems or zones to prevent contamination and fiber dispersal to other areas of the building or structure. During the Work, vents within the work area shall be covered with two (2) layers of 6-mil poly sheeting completely sealed with duct tape. If deactivation is not possible, isolation shall include a hard barrier, such as plywood or rigid-foam insulation board, securely affixed to active duct openings prior to covering with 2 layers of 6-mil poly sheeting completely sealed with duct tape.
- E. The Contractor shall be responsible for removing furniture, equipment, and any other materials to be salvaged from the work areas. The Contractor shall be responsible for removing all solid waste within the work areas. The Contractor shall pre-clean moveable objects within the proposed work areas using HEPA-vacuum equipment and/or wet-cleaning methods as appropriate and remove such objects from work areas.
- F. Completely seal all openings including, but not limited to, windows, corridors, doorways, skylights, ducts, grills, diffusers, and any other work area penetrations with 6-mil poly sheeting sealed with duct tape. This includes doorways and corridors that will not be used for passage during work.
- G. Pre-clean fixed objects within the work areas with HEPA-vacuum equipment and/or wet-cleaning methods as appropriate, and enclose with 6-mil poly sheeting completely sealed with duct tape.
- H. Clean the proposed work areas using HEPA-vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.
- I. After HEPA-vacuum cleaning, where wall materials are not being abated, cover fixed walls with 2 layers of 4-mil poly sheeting. Where fixed walls do not form a barrier, 2 layers of 6-mil poly sheeting shall be applied to a rigid framework of wood, metal, or polyvinyl chloride (PVC). Where flooring materials are not being abated, cover the floor with 2 layers of 6-mil poly sheeting. Where ceiling materials are not being abated, cover ceilings with 2 layers of 4-mil poly sheeting in accordance with current MassDEP Regulation 310 CMR 7.15(7)(c)(6). All overlaps shall be completely sealed with tape and spray adhesive.

- J. Pursuant to MassDEP Regulation 310 CMR 7.15(7)(c)(4), large openings such as open doorways, elevator doors, and passageways shall be first sealed with solid construction materials, such as plywood over studding, which shall constitute the outermost boundary of the Asbestos Abatement work area. All cracks, seams, and openings in such solid construction materials shall be caulked or otherwise sealed, so as to prevent the movement of asbestos fibers out of the work area.
- K. Maintain emergency and fire exits from the work areas, or establish alternate exits satisfactory to fire officials.
- L. Clean and remove ceiling-mounted objects, such as lights and other items not sealed-off, which interfere with asbestos abatement. Use hand-held, amended water sprayers or HEPA-vacuum equipment during fixture removal to reduce settled fiber dispersal.
- M. Create pressure differential between work areas and adjacent unregulated areas by the use of acceptable HEPA-filtered work area ventilation systems sufficient to provide 4 air changes per hour, and create a negative air pressure of -0.02 inches of water column within the NPE with respect to the adjacent area as measured on a manometer.
- N. If a Consultant is retained for pre-abatement services, the Contractor and the Consultant shall visually inspect barrier several times daily to assure an effective seal and the Contractor shall repair defects immediately.

3.03 WORK AREA PREPARATION - EXTERIOR WINDOW SYSTEM ABATEMENT

- A. This Subsection only applies to exterior window caulking/glazing compounds pursuant to MassDEP Regulation 310 CMR 7.15(11). All other ACM abatement work area preparations must follow Subsection 3.2, unless a NTWP is submitted to, and approved by, MassDEP.
- B. Work is to be conducted from the building exterior. Completely seal all openings including, but not limited to, windows, doors, ventilation openings, drains, grilles, diffuser grates, and any other penetration into the work areas with 2 layers of 6-mil poly sheeting completely sealed with tape and spray adhesive.
- C. Window openings shall be isolated from the building interior on the interior side using 2 layers of 6-mil poly sheeting sealed with tape and spray adhesive.
- D. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet from the building perimeter where ACM and/or ACWM are to be removed. Poly sheeting shall be attached to the building foundation with tape and spray adhesive.

- E. Movable lifts or staging platforms to be used during abatement shall be protected with 2 layers of 6-mil poly sheeting.
- F. Pre-clean fixed objects within the work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate, and enclose with 6-mil poly sheeting sealed with tape.
- G. Clean the proposed work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.
- H. Post asbestos warning signs, in accordance with OSHA Title 29 CFR, Part 1926.1101, at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read them and take precautionary measures to avoid exposure to asbestos.
- I. Maintain emergency and fire exits from the work area or establish alternative exits satisfactory to fire officials.

3.04 WORK AREA PREPARATION - ASPHALTIC ROOFING AND SIDING MATERIALS ABATEMENT

- A. This Subsection only applies to asphaltic roofing materials pursuant to MassDEP Regulation 310 CMR 7.15(10). All other ACM abatement work area preparations must follow Subsection 3.2, unless a NTWP is submitted to, and approved by, MassDEP.
- B. Work is to be conducted from the building exterior. Completely seal all openings at the roof level including, but not limited to, windows, doors, ventilation openings, drains, grilles, diffuser grates, and any other penetration into the work areas with 2 layers of 6-mil poly sheeting completely sealed with tape and spray adhesive.
- C. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet from the building perimeter where ACM and/or ACWM are to be removed. Poly sheeting shall be attached to the building foundation with tape and spray adhesive.
- D. Provide 2 layers of 6-mil poly sheeting on exterior ground surface extending to a minimum of ten (10) feet around any waste receptacle.
- E. Movable lifts or staging platforms to be used during abatement shall be protected with 2 layers of 6-mil poly sheeting.

- F. Pre-clean fixed objects within the work areas (e.g., air handling units, roof-top fans, etc.) using HEPA-vacuum equipment and wet-cleaning methods, as appropriate, and enclose with 6-mil poly sheeting sealed with tape.
- G. Clean the proposed work areas using HEPA-vacuum equipment and wet-cleaning methods, as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.
- H. Post asbestos warning signs, in accordance with OSHA Title 29 CFR, Part 1926.1101, at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read them and take precautionary measures to avoid exposure to asbestos.
- I. If a Consultant is retained for pre-abatement services, the Contractor and the Consultant shall visually inspect barrier several times daily to assure effective seal and the Contractor shall repair defects immediately.
- J. Maintain emergency and fire exits from the work area or establish alternative exits satisfactory to fire officials.

3.05 DECONTAMINATION ENCLOSURE SYSTEM (DECON)

- A. The Contractor shall establish, contiguous to the work area, a three-chamber decon consisting of (in-series) equipment room, shower room, and clean room. The only access between contaminated and uncontaminated areas shall be through this decon. If it is not feasible to erect a contiguous decon, the Contractor shall establish a remote decon in as close proximity to the work area as is feasible. For abatement not requiring a NPE, the Contractor shall establish a remote decon at the perimeter of the regulated work area. Use of a remote decon shall be specified on the Contractor's Asbestos Notification Form (ANF-001).
- B. Access between rooms in the decon shall be through double-flap, curtained openings. The clean room, shower room, and equipment room within the decon shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.
- C. If feasible, the Contractor shall establish, contiguous with the work area, an equipment decon consisting of 2 totally-enclosed chambers divided by a double-flapped, curtained opening. No personnel are permitted to enter or exit through this unit.
- D. Construct the decon with wood or metal framing, cover both sides with 2 layers of 6-mil poly sheeting, completely sealed with spray adhesive, and taped at the joints.

3.06 ASBESTOS REMOVAL PROCEDURE - GENERAL

- A. Prior to the removal of ACM, the Contractor shall ensure that work area preparations have been conducted in accordance with applicable Subsections of this Section.
- B. The Contractor shall have a MADLS-licensed Asbestos Supervisor on the Site at all times to ensure establishment of a proper NPE and proper work practices throughout project.
- C. If a Consultant is retained for pre-abatement services, abatement work shall not commence until authorized by the Consultant.
- D. The Contractor shall properly coordinate abatement work with other trades, new construction, and Site use. The Contractor shall be responsible for addressing any concerns to the Owner and/or Consultant.
- E. With a fine mist, spray ACM/ACWM with amended water using airless spray equipment or apply an approved removal wetting agent to reduce the release of fibers during removal operation.
- F. Remove wet ACM/ACWM in manageable sections to keep fiber concentrations to a minimum. Material drop shall not exceed 8 feet. For heights up to 15 feet, provide inclined chutes or scaffolding to intercept drop.
- G. Remove ACM/ACWM by standard methods, as appropriate. Fill disposal containers as removal proceeds; seal filled containers and clean containers before removal to equipment decon. Wet clean each container thoroughly, double bag, and apply caution labels, if required.
- H. After completion of stripping work, all surfaces from which ACM/ACWM have been removed shall be wet brushed, using a nylon brush, wet-wiped, and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are prohibited). During this work, the surfaces being cleaned shall be kept wet.
- I. Remove and containerize all visible accumulations of ACM and ACWM. During cleanup, utilize brooms, non-metal dustpans, and rubber squeegees to minimize damage to floor covering. Non-porous materials (i.e., metal) to be removed from the work area during abatement activities for recycling/disposal as solid waste shall be cleaned and visually inspected by an Asbestos Project Monitor prior to removal from work areas.

- J. Sealed disposal containers, and all equipment used in the work area, shall be included in the cleanup and shall be removed from work areas via the equipment decon at an appropriate time in the cleaning sequence. All asbestos waste in 6-mil poly disposal bags shall be double-bagged in the equipment decon before removal from the Site.
- K. At any time during asbestos removal, should the Consultant suspect contamination of areas outside the work area(s), they shall cause all abatement work to stop until the Contractor takes the necessary steps to decontaminate these areas and eliminate the causes of such contamination. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections verify decontamination.
- L. After completion of the initial final cleaning procedure, including removal of the inner layers of poly sheeting but prior to encapsulation, a pre-sealant inspection shall be conducted by the Consultant. The pre-sealant inspection shall verify that ACM and residual dust has been removed from the work area.

3.07 ASBESTOS REMOVAL PROCEDURES - INTERIOR CAULKING AND GLAZING COMPOUNDS

- A. Unless an approved NTWP is obtained, removal of interior window caulking and glazing compounds shall be performed within a NPE.
- B. Spray ACM with amended water using airless spray equipment or apply an approved wetting agent to reduce the release of fibers during removal operations.
- C. Window systems with asbestos-containing glazing compound shall be removed and wrapped for disposal as ACWM.
- D. Asbestos-containing caulking/glazing compound shall be wet-misted and removed from substrates. Asbestos caulking/glazing compound shall be placed in double 6-mil poly disposal bags.
- E. Caulking/glazing compound may be covered with non-asbestos, silicone-type caulking that must be removed to completely access and abate asbestos-containing caulking from substrates. Caulking in contact with asbestos-containing caulking shall be placed in double 6-mil poly disposal bags for disposal as ACWM.
- F. Upon removal, caulking and/or substrates to be disposed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.

3.08 ASBESTOS REMOVAL PROCEDURES - GLOVEBAG OPERATIONS

A. Specifications:

1. Glovebags shall be constructed of 6-mil poly and be seamless at the bottom.
2. Glovebags used on pipe-fitting insulations and other pipe connections must be designed for that purpose and used without modifications, per manufacturer instructions for use.

B. Work Practices:

1. At least 2 persons shall perform Class I glovebag removal operations.
2. Each glovebag shall be installed so it completely covers the circumference of the pipe or other structure where the work is to be performed.
3. Glovebags shall be smoke-tested for leaks and any leaks sealed prior to use.
4. Glovebags may be used only once and may not be moved.
5. Glovebags shall not be used on surfaces where temperature exceeds 150°F.
6. Prior to disposal, glovebags shall be collapsed by removing air within them using HEPA-vacuum equipment.
7. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be rendered intact by the use of re-wettable, plaster-impregnated cloth.
8. Where system uses attached waste bag, such bag shall be connected to collection bag using hose or other material that shall withstand pressure of ACM waste and water without losing integrity.
9. Sliding valve or other device shall separate waste bag from hose to ensure no exposure when waste bag is disconnected.

3.09 ASBESTOS REMOVAL PROCEDURES - EXTERIOR DOOR SYSTEM CAULKING

- A. Unless an approved NTWP is obtained, removal of the exterior door system caulking shall be performed within a dust-tight enclosure.
- B. Work shall be conducted from the building exterior.
- C. Spray ACM with amended water using airless spray equipment or apply an approved wetting agent to reduce the release of fibers during removal operations.
- D. Asbestos-containing caulking shall be wet-misted and removed from substrates. Asbestos caulking shall be placed in double 6-mil poly disposal bags.

- E. Caulking may be covered with non-asbestos, silicone-type caulking that must be removed to completely access and abate asbestos-containing caulking from substrates. Caulking in contact with asbestos-containing caulking shall be placed in double 6-mil poly disposal bags for disposal as ACWM.
- F. Upon removal, caulking and/or substrates to be disposed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.

3.10 ASBESTOS REMOVAL PROCEDURES - EXTERIOR WINDOW SYSTEMS

- A. Work shall be conducted from the building exterior pursuant to MassDEP Regulation 310 CMR 7.15(11) - Requirements for Window Painting and/or Repair Work that Result in the Disturbance of Asbestos-Containing Glazing and/or Caulking Compounds.
- B. It will be at the discretion of the Consultant to determine if removal procedures will render ACM friable, thus requiring additional dust control measures to prevent airborne asbestos fiber concentrations and/or environmental contamination.
- C. Spray ACM with amended water using airless spray equipment or apply an approved wetting agent to reduce fiber release during removal operations.
- D. Window sashes with asbestos-containing glazing compound shall be removed and wrapped in 2 layers of 6-mil poly sheeting for disposal as ACWM.
- E. Asbestos-containing exterior caulking shall be wet-misted and removed from window and door frames. Asbestos caulking shall be placed in double 6-mil poly disposal bags.
- F. Asbestos-containing caulking shall be removed from rough openings including masonry, lintels, and sills by wet-misting. Caulking may be covered with non-asbestos silicone-type caulking that must be removed to completely access and abate asbestos-containing caulking from window and door systems. All debris shall be placed in double 6-mil poly disposal bags for disposal as ACWM.
- G. Upon removal, caulking, glazing compound, and/or window system frames to be disposed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.
- H. Surrounding surfaces, such as exterior brick/block, remaining window surfaces, etc. shall be thoroughly cleaned with HEPA-vacuum equipment and wet-wiped to remove all visible dust and debris.

- I. Once the Consultant completes their final visual inspection, the Contractor shall remove protective the poly sheeting by rolling in all 4 corners towards the center.
- J. Check all ground surfaces in work areas after removal is complete and the protective ground poly drop cloths have been removed. Remove and dispose any suspect ACM observed on the ground.

3.11 ASBESTOS REMOVAL PROCEDURES - EXTERIOR DAMPPROOFING/
WATERPROOFING

- A. Unless an approved NTWP is obtained, removal of the dampproofing/waterproofing materials shall be performed within a dust-tight enclosure.
- B. Expose the partially-concealed dampproofing/waterproofing in a manner that does not disturb ACM.
- C. Spray ACM with amended water using airless spray equipment, or apply an approved wetting agent to reduce the potential for fiber release during removal operations.
- D. Remove exterior asbestos-containing dampproofing using hand tools, and place directly into durable, leak-tight containers, or two 6-mil poly bags, and properly label.
- E. Surrounding surfaces shall be thoroughly cleaned with HEPA-filter vacuum equipment, and wet-wiped to remove all visible dust and debris. Place waste directly into durable leak-tight containers, or two 6-mil poly bags, and properly label for disposal as ACWM.

3.12 ASBESTOS REMOVAL PROCEDURES - EXTERIOR THROUGH-WALL
FLASHING

- A. Unless an approved NTWP is obtained, removal of the through-wall flashing materials shall be performed within a dust-tight enclosure.
- B. Spray ACM with amended water using airless spray equipment or apply an approved wetting agent to reduce the release of fibers during removal operations.
- C. Asbestos-containing through-wall flashing shall be removed from rough openings including, but not limited to, masonry, lintels, and sills by wet-misting. Masonry demolition may be required to access through-wall flashing.

- D. Upon removal, through-wall flashing and any masonry removed during abatement shall be wrapped in 2 layers of 6-mil poly or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.

3.13 ASBESTOS REMOVAL PROCEDURES - EXTERIOR ROOFING SEALANTS

- A. Pursuant to MADLS Regulation 453 CMR 6.13(2)(a)(5), work operations that involve the breaking, shearing, or slicing of Category I non-friable, asbestos-containing, asphaltic roofing materials are not subject to the requirements of MADLS Regulation 453 CMR Part 6.00, as long as the work does not result in the production of asbestos dust or the material becoming friable.
- B. Work shall be conducted pursuant to MassDEP Regulation 310 CMR 7.15(10).
- C. Asbestos-containing sealants shall be wet-misted to reduce the release of fibers and removed from surfaces.
- D. Asbestos-containing sealants shall be removed from all surfaces (i.e., masonry, wood, etc.). Sealant may be covered with non-asbestos silicone type caulking that must be removed to completely remove asbestos-containing caulking from surfaces. Caulking in contact with asbestos caulking shall be placed in double 6-mil poly disposal bags for disposal as ACWM.
- E. Upon removal, sealants and any flashing material removed shall be wrapped in 2 layers of 6-mil poly sheeting or placed in double 6-mil poly disposal bags and properly labeled for disposal as ACWM.
- F. Pursuant to MassDEP Regulation 310 CMR 19.000, asbestos-containing, asphaltic roofing materials may be disposed in any landfill permitted by MassDEP to accept solid waste. If the asbestos-containing, asphaltic roofing materials are not handled in accordance with MassDEP Regulation 310 CMR 7.15(10) or if MassDEP has determined that asbestos fibers may be released during handling, removal, or disposal, then the materials shall be disposed in a landfill that has obtained a special waste permit to accept ACWM or is managing such wastes in accordance with 310 CMR 19.061.

3.14 ASBESTOS REMOVAL PROCEDURE – SLATE ROOF TILE CEMENT

- A. Unless an approved NTWP is obtained, slate roof tile cement removal shall be performed within a dust-tight enclosure.
- B. Wet methods shall be used during removal of ACM.
- C. Slate roof tiles and tile cement shall be removed to expose the underlying roof deck.

- D. Upon removal, asbestos-containing roofing materials shall be wrapped in two (2) layers of 6-mil poly, appropriately labeled, and lowered to the ground via dust-tight chute, crane, or hoist no later than the end of the work shift. Alternatively, ACWM may be double-bagged at the roof and transported to ground. Dumpsters shall be lined with two (2) layers of 10-mil poly and sealed at the end of each work shift.
- E. If the Contractor decides to remove the cement from individual roof tiles instead of whole-component removal and disposal as ACWM, the slate roof tiles shall be stacked neatly in bins after final cleaning, stored on a 6-mil poly drop cloth, and covered tightly with 6-mil poly until a final visual inspection is performed by the Consultant. If the slate roof tiles meet the “no visible suspect dust or debris” standard, they may be disposed as general construction debris.

3.15 CONSULTANT’S AIR SAMPLING RESPONSIBILITIES

- A. Air sampling will be conducted by the Consultant’s Asbestos Project Monitor to determine the effectiveness of the work area controls in preventing asbestos contamination. Independently, the Contractor shall monitor air quality within the work area to comply with OSHA regulations for worker safety.
- B. The Consultant’s Asbestos Project Monitor will collect and analyze air samples during the following period:
 - 1. Removal Period: If required or retained for this service, the Consultant’s Asbestos Project Monitor will provide continual evaluation of the building air quality during removal, using their best professional judgment in respect to the MADLS guidance level of 0.010 fibers/cc and the background airborne fiber concentration, if established during the pre-abatement period.
 - a. If the Consultant’s Asbestos Project Monitor determines that the building air quality has become contaminated from the abatement project, they shall immediately inform the Contractor to cease all removal operations, and implement a work stoppage cleanup procedure. The Contractor shall conduct a thorough cleanup of the building areas designated by the Consultant. No further removal work may occur until the Asbestos Project Monitor has determined through air sample collection and analysis that the airborne fiber concentrations are at or below the MADLS re-occupancy standard.

2. Post-Abatement Period: If required, the Consultant's Asbestos Project Monitor will conduct air sampling following the final cleanup phase of the project, once the "no visible, suspect dust or debris" criterion, as established by the Consultant's Asbestos Project Monitor, has been met and the work area has been encapsulated by the Contractor. Final clearance air samples shall be collected in accordance with the MADLS re-occupancy clearance standard.
 - a. As required, the Consultant's Asbestos Project Monitor will collect final re-occupancy clearance air samples inside the work area at the completion of abatement work. These final clearance air samples shall be analyzed in accordance with requirements of EPA Title 40 CFR, Part 763, Subpart E and MADLS Regulation 453 CMR 6.00.
 - b. Final clearance air sample collection and analysis will be in accordance with MADLS Regulation 453 CMR 6.14(5)(b)(2)(c) and include at least 1 sample for each 500 linear/1,000 square feet of asbestos or portion thereof, or 1 sample per room, whichever is greater. A minimum of 2 samples per clearance will be collected and analyzed. Sample collection and analysis shall be in accordance with NIOSH 7400 Method and include utilizing aggressive air-sampling techniques to obtain a minimum air volume of 1,200 liters.
 - c. The Owner shall be responsible for payment for the initial final clearance air sampling performance, only. If the first set of samples fails to satisfy the re-occupancy criteria, the Contractor shall be responsible for payment of all costs associated with the additional final clearance air sampling and analysis.
 - d. The Contractor shall properly schedule abatement work and other site activities at appropriate times and locations to prevent cross-contamination and/or dust in areas where the Consultant's Asbestos Project Monitor will conduct air sampling.

3.16 CONSULTANT'S INSPECTION RESPONSIBILITIES

- A. The Consultant's Asbestos Project Monitor may conduct inspections throughout the progress of the abatement project. Inspections will be conducted to document the abatement work progress, as well as the Contractor's procedures and practices.
- B. The Consultant's Asbestos Project Monitor may perform the following inspections during abatement activities:

1. Pre-Commencement Inspection: If required or retained for this service, pre-commencement inspections shall be performed at the time requested by the Contractor. The Consultant shall be informed 24 hours prior to the time the inspection is needed. If deficiencies are noted during the pre-commencement inspection, the Contractor shall perform the necessary adjustments to obtain compliance.
 2. Work Area Inspections: If required or retained for this service, work area inspections shall be conducted on a daily basis, at the discretion of the Consultant. During the work inspections, the Consultant's Asbestos Project Monitor shall observe the Contractor's removal procedures, verify barrier integrity, monitor HEPA-filtered work area ventilation systems, assess project progress, and, if deficiencies are noted, inform the Contractor of specific remedial activities.
- C. The Consultant's Asbestos Project Monitor shall perform the following inspections after removal activities are completed:
1. Pre-Sealant Inspection: If required or retained for this service, the Consultant's Asbestos Project Monitor will conduct a pre-sealant inspection, at a time requested by the Contractor. The Consultant shall be informed 24 hours prior the time that the inspection is needed. The pre-sealant inspection shall be conducted after completion of the initial cleaning procedures, but prior to encapsulation. The pre-sealant inspection shall verify that all ACM and residual debris have been removed from the work area. If the Consultant's Asbestos Project Monitor identifies residual dust or debris during the pre-sealant inspection, the Contractor shall re-clean to meet the "no visible, suspect dust or debris" standard.
 2. Final Visual Inspection: When abatement is complete, the Consultant's Asbestos Project Monitor will conduct a final visual inspection inside each regulated work area. The Consultant shall be informed 24 hours prior to the time that the inspection is needed. Following the removal of the inner layer of poly sheeting, but prior to final clearance air sampling, the Consultant's Asbestos Project Monitor will conduct a final visual inspection inside the work area. If residual dust or debris is identified during the final inspection, the Contractor shall re-clean to meet the "no visible, suspect dust or debris" standard.

3.17 ASBESTOS DISPOSAL

- A. ACM and/or ACWM disposal (including supplies, rags, disposable clothing, respirator filter cartridges, etc.) shall be completed in accordance with MassDEP and EPA regulations. Waste receptacles (bags, drums, etc.) shall be labeled in accordance with the most current OSHA regulations (Title 29 CFR, Parts 1910.1001 and 1926.1101) and contain the following:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

- B. Disposal site approvals shall be obtained and accepted prior to the start of asbestos removal activities.
- C. A copy of the signed disposal authorization shall be provided to the Owner, Consultant, and any required federal, state, or local agencies.
- D. Copies of all Waste Shipment Records (WSR) shall be provided to the Owner no later than 35 calendar days from when the waste was removed from the Site for inclusion in the project file. The Contractor shall document the specific amount of waste on each WSR, portion/location of the Site building it was generated from, and the type of waste. Upon receipt of the ACM waste, the landfill operator shall sign the WSR so the quantity of asbestos debris leaving the Site and arriving at the landfill is documented for the Owner.
- E. All wash water and shower water shall be collected and filtered through a five-micron filter before discharge to a sanitary sewer with prior appropriate permitting or publicly-owned treatment works (POTW) approval. Alternately, wash and shower water can be used to moisten ACWM.
- F. All ACWM shall be transported in covered sealed vans, boxes, or dumpsters which are physically isolated from the driver by an airtight barrier. All vehicles must be properly-licensed to meet Commonwealth of Massachusetts and United State Department of Transportation (DOT) requirements.
- G. Any vehicles used to store or transport ACWM will either be removed from the Site at night, or securely locked and posted to prevent disturbance.

DEMOLITION OF FORMER OSTERVILLE BAY SCHOOL AND
OSTERVILLE COMMUNITY CENTER
HYANNIS, MASSACHUSETTS
CBI JOB NO: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
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- H. Any incident and/or accident that may result in spilling or exposure of ACWM outside the containment, on and off the property, and all related issues shall be the sole responsibility of the Contractor.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 02 83 10

LEAD-BASED PAINT AWARENESS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. General Provisions of Contract, including General Supplementary Conditions shall apply to this Section.
- B. Hazardous Building Materials Inspection Report prepared by Fuss & O'Neill EnviroScience, LLC (August 12, 2014).
- C. Section 02 41 00 - Demolition.
- D. Section 02 82 13 - Asbestos Abatement.
- E. Asbestos Abatement Drawings HA-01 - HA-06 prepared by Fuss & O'Neill EnviroScience, LLC.

1.02 SUMMARY OF WORK

- A. Work of this Section includes requirements for worker protection and waste disposal related to demolition involving lead-based paint (LBP)-coated building components and surfaces (the "Work") at the former West Bay Elementary School and Osterville Community Center located on West Bay Road in Osterville, Massachusetts (the "Site").
- B. All Work associated with the Osterville Community Center is part of Add Alternate 1.
- C. The procedures referenced herein shall be utilized during required demolition work, specified elsewhere, that may impact building components coated with LBP. The following painted components were determined to be coated with LBP:
 - 1. Former West Bay Elementary School
 - a. Metal Door Frames;
 - b. Plaster Walls;
 - c. Wood Window Frames; and
 - d. Bathroom Stall Doors.

- D. A LBP screening was conducted at the Osterville Community Center utilizing X-ray fluorescence (XRF). Not every coated building component was tested. The screening results indicated none of the painted building components were determined to be coated with LBP (greater than or equal to one milligram of lead per square centimeter [$\geq 1.0 \text{ mg/cm}^2$]). However, detectable levels of lead ($> 0.1 \text{ mg/cm}^2$, but less than [$<$] 1.0 mg/cm^2) were detected on all painted surfaces screened.
- E. Work impacting LBP-coated components may result in dust and debris exposing workers to levels of lead above the Occupational Safety and Health Administration's (OSHA) Action Level. Worker protection, training, and engineering controls referenced herein shall be strictly followed, until completion of exposure assessment with results indicating exposures below the "Action Level". This Section does not involve lead abatement, but identified worker protection requirements for trades involved in the demolition and disposal procedures if LBP is involved in the demolition waste stream.
- F. Construction activities disturbing surfaces coated with LBP that are likely to be employed, such as demolition, sanding, grinding, welding, cutting, and burning, have been known to expose workers to levels of lead in excess of the OSHA Permissible Exposure Limit (PEL). All work specified in the Contract Documents shall also be in conformance with this Section.

1.03 DEFINITIONS

- A. The following definitions relative to LBP shall apply:
1. Action Level (AL): The allowable employee exposure, without regard to use of respiratory protection, to an airborne concentration of lead over an eight (8)-hour time-weighted average (TWA) as defined by OSHA. The current action level is thirty micrograms per cubic meter ($30 \mu\text{g/m}^3$) of air.
 2. Architect: CBI Consulting, Inc.
 3. Area Monitoring: The sampling of lead concentrations, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
 4. Biological Monitoring: The analysis of a person's blood and/or urine, to determine the level of lead concentration in the body.
 5. CDC: The Center for Disease Control.
 6. Change Room: An area provided with separate facilities for clean protective work clothing and equipment and for street clothes, which prevents cross-contamination.
 7. Competent Person: A person employed by the Contractor who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA.

8. Consultant: Fuss & O'Neill EnviroScience, LLC.
9. EPA: The United States Environmental Protection Agency.
10. Exposure Assessment: An assessment conducted by an employer to determine if any employee may be exposed to lead at or above the AL.
11. High-Efficiency Particulate Air (HEPA): A type of filtering system capable of filtering out particles of 0.3 microns diameter from a body of air at 99.97% efficiency or greater.
12. HUD: The United States Housing and Urban Development.
13. Lead: Refers to metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.
14. Lead Work Area: An area enclosed in a manner to prevent the spread of lead dust, paint chips, or debris resulting from LBP disturbance.
15. Lead-Based Paint: Refers to paints, glazes, and other surface coverings containing a toxic level of lead.
16. MSHA: The Mine Safety and Health Administration.
17. NARI: The National Association of the Remodeling Industry.
18. NIOSH: The National Institute of Occupational Safety and Health.
19. OSHA: The Occupational Safety and Health Administration.
20. Owner: Town of Barnstable.
21. Permissible Exposure Limit (PEL): The maximum allowable limit of exposure to an airborne concentration over an 8-hour TWA, as defined by OSHA. The current PEL for lead is fifty (50) $\mu\text{g}/\text{m}^3$ of air. Extended workdays lower the PEL by the formula: PEL equals 400 divided by the number of hours of work.
22. Personal Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour TWA concentration in accordance with OSHA Title 29 CFR, Parts 1910.1025 and 1926.62. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a sphere with a radius of eighteen (18) inches and centered at the nose or mouth of an employee.
23. Resource Conservation and Recovery Act (RCRA): RCRA establishes regulatory levels of hazardous chemicals. There are 8 heavy metals of concern for disposal: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Six (6) of the metals are typically in paints, excluding selenium and silver.
24. SDS: Safety Data Sheets.
25. Site: The former West Bay Elementary School and Osterville Community Center located on West Bay Road in Osterville, Massachusetts.
26. Toxic Level of Lead: A level of lead, when present in dried paint or plaster, contains more than 0.50% lead by dry weight as measured by atomic absorption spectrophotometry (AAS) or 1.0 milligram per square centimeter (mg/cm^2) as measured by on-site testing utilizing an x-ray fluorescence analyzer.

LEAD-BASED PAINT AWARENESS

27. Toxicity Characteristic Leaching Procedure (TCLP): The EPA required sample preparation and analysis method for determining the hazard characteristics of a waste material. Waste must be disposed as Hazardous Waste if a TCLP analytical result indicates leaching greater than or equal to five milligrams per liter (≥ 5.0 mg/L).
28. TWA: Time-Weighted Average.

1.04 REGULATIONS AND STANDARDS

A. All applicable regulations, standards, and ordinances of federal, state, and local agencies are applicable and made a part of this Section. This includes, but is not limited to, the following:

1. American National Standards Institute (ANSI)
 - a. ANSI 288.2 - 1980 Respiratory Protection
2. Code of Federal Regulation (CFR)
 - a. Title 29 CFR, Part 1910.134 - Respiratory Protection
 - b. Title 29 CFR, Part 1910.1025 - Lead
 - c. Title 29 CFR, Part 1910.1200 - Hazard Communication
 - d. Title 29 CFR, Part 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists
 - e. Title 29 CFR, Part 1926.57 - Ventilation
 - f. Title 29 CFR, Part 1926.59 - Hazard Communication in Construction
 - g. Title 29 CFR, Part 1926.62 - Lead in Construction Interim Final Rule
 - h. Title 40 CFR, Parts 124 and 270 - Hazardous Waste Permits
 - i. Title 40 CFR, Part 172 - Hazardous Materials Tables and Communication Regulations
 - j. Title 40 CFR, Part 178 - Shipping Container Specifications
 - k. Title 40 CFR, Part 260 - Hazardous Waste Management Systems: General
 - l. Title 40 CFR, Part 261 - Identification and Listing of Hazardous Waste
 - m. Title 40 CFR, Part 262 - Generators of Hazardous Waste
 - n. Title 40 CFR, Part 263 - Transporters of Hazardous Waste
 - o. Title 40 CFR, Part 264 - Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - p. Title 40 CFR, Part 265 - Interim Statutes for Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - q. Title 40 CFR, Part 268 - Lead Disposal Restrictions
 - r. Title 49 CFR, Parts 170 - 180 Hazardous Wastes

3. Underwriters Laboratories, Inc. (UL)
 - a. UL586 - 1990 High Efficiency Particulate Air Filter Units

1.05 QUALITY ASSURANCE

- A. Hazard Communication Program
 1. The Contractor shall establish and implement a Hazard Communication Program as required by OSHA Title 29 CFR, Part 1926.59.
- B. Compliance Plan (Site-Specific)
 1. The Contractor shall establish a written compliance plan, which is specific to the Site, to include the following:
 - a. A description of work activity involving LBP disturbance including equipment used, material included, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.
 - b. Engineering controls used to control lead exposure.
 - c. The proposed technology the Contractor will implement in meeting the PEL.
 - d. Air monitoring data documenting the source of lead emissions.
 - e. A detailed schedule for implementing the program, including documentation of appropriate supply of equipment, etc.
 - f. Proposed work practice which establishes proper protective work clothing, housekeeping methods, hygiene facilities, and practices.
 - g. Worker rotation schedule (if proposed), to reduce TWA.
 - h. A description of methods for informing workers of potential lead exposure.
- C. Hazardous Waste Management
 1. The Contractor shall establish a Hazardous Waste Management Plan, which shall comply with applicable regulations and address the following:
 - a. Hazardous waste identification.
 - b. Estimated waste disposal quantity.
 - c. Names and qualifications of each subcontractor who will be transporting, storing, treating, and disposing wastes.
 - d. Disposal facility location and 24-hour point of contact.
 - e. Establish EPA state hazardous waste and identification numbers, if applicable.
 - f. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

LEAD-BASED PAINT AWARENESS

- g. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, if applicable, and transport equipment.
- h. Qualifications of laboratory to be utilized for TCLP sampling and analysis, if applicable.
- i. Spill Prevention, Control, and Countermeasure (SPCC) Plan.
- j. Work plan and schedule for waste containment, removal, treatment, and disposal.

D. Medical Examinations

- 1. Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by OSHA Title 29 CFR, Parts 1910.1025 and 1926.62.
- 2. The examination shall not be required if adequate records show that employees have been examined as required by OSHA Title 29 CFR, Part 1926.62 within the last year.
- 3. Medical examination shall include, at a minimum, biological monitoring and approval to wear respiratory protection.

E. Training

- 1. The Contractor shall ensure that workers are trained to perform LBP disturbing activities and disposal operations prior to the start of work, in accordance with OSHA Title 29 CFR, Part 1926.62.

F. Respiratory Protection Program

- 1. The Contractor shall furnish each employee required to wear a negative pressure respirator with a respirator fit test at the time of initial fitting and at least once every 6 months thereafter, as required by OSHA Title 29 CFR, Part 1926.62.
- 2. The Contractor shall establish a Respiratory Protection Program in accordance with ANSI Z88.2 and OSHA Title 29 CFR, Parts 1910.134 and 1926.62.

1.06 SUBMITTALS

- A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting and at least ten (10) business days before the start of the Work:

- 1. Submit a schedule to the Owner and the Consultant, which defines a timetable for executing and completing the project, including work area preparations, removal, cleanup, and decontamination.

2. Submit a current, valid certificate of insurance.
3. Submit the name and address of the hauling contractor and location of the landfill to be used. Also, submit current valid operating permits and certificates of insurance for the transporter and landfill.
4. Submit the plans and construction details for the decontamination systems and the isolation of the work areas as may be necessary for compliance with this Section and applicable regulations.
5. Submit copies of medical records for each employee to be used on the project, including results of biological monitoring and a notarized statement by the examining physician that such an examination occurred.
6. Submit valid training certificates for each employee to be used on the project.
7. Submit a successful respirator fit testing record performed by a qualified individual within the previous six months for each employee to be used on this project. The employee's name and social security number must be provided with each record.
8. Submit the name and address of the Contractor's blood lead testing lab, OSHA CDC listing, and state certification.
9. Submit detailed product information on all materials and equipment proposed for demolition work on this project.
10. Submit pertinent information regarding the qualifications of the Project Supervisor (competent person) for this project, as well as a list of past projects completed.
11. Submit a chain-of-command for the project.
12. Submit a site-specific Emergency Action Plan for the project.
13. Submit a written, site-specific Respiratory Protection Program for employees, including make, model, and NIOSH approval numbers of respirators to be used at the Site (if applicable).

No work on the Site will be allowed to begin until the Owner and the Consultant, as listed herein, accept the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation accurately, completely, and in a timely manner does not constitute a cause for change order or a time extension.

B. The following shall be submitted to the Consultant during the Work:

1. Personal air sampling results.
2. Training and medical records for new employees to start Site work (24-hours in advance).

C. The following shall be submitted to the Consultant at the completion of the Work:

1. Copies of all air sampling results.
2. Contractor logs.

LEAD-BASED PAINT AWARENESS

3. Copies of manifests and receipts acknowledging disposal of all waste material from the project showing delivery date, quantity, and appropriate signature of authorized landfill representative.

1.07 PERSONAL PROTECTION

A. Exposure Assessment

1. The Contractor shall determine if any worker will be exposed to lead at or above the AL.
2. The exposure assessment shall identify the level of exposure a worker would be subjected to without respiratory protection.
3. The exposure assessment shall be achieved by obtaining personal air monitoring samples representative of a full shift, at least an 8-hour TWA.
4. During the period of the exposure assessment, the Contractor shall institute the following procedures for worker protection:
 - a. Protective clothing shall be utilized
 - b. Respiratory protection
 - c. Change areas shall be provided
 - d. Hand washing facilities and shower shall be provided
 - e. Biological monitoring
 - f. Worker training

B. Respiratory Protection

1. The Contractor shall furnish appropriate NIOSH/MSHA-approved respirators for use in atmospheres containing lead dust.
2. Respirators shall comply with the requirements of OSHA Title 29 CFR, Part 1926.62.
3. Workers shall be instructed in all aspects of respiratory protection.
4. The Contractor shall have an adequate supply of HEPA-filter cartridges and spare parts on-site for all types of respirators in use.
5. The following minimum respirator protection for use during paint removal or demolition of components and surfaces with LBP shall be the half-face, air-purifying respirator with a minimum of dual P100 filter cartridges (for exposures not in excess of $500 \mu\text{g}/\text{m}^3$ or 10 x PEL).

C. Protective Clothing

1. Personal protective clothing shall be provided for all workers, supervisors, and authorized visitors entering the work area.
2. Each worker shall be provided daily with a minimum of two (2) complete disposable coverall suits.

3. Removal workers shall not be limited to 2 coveralls, and the Contractor shall supply additional coveralls as necessary.
4. Under no circumstances shall anyone entering the abatement area be allowed to re-use a contaminated disposable suit.
5. Disposable suits (Tyvek™ or equivalent) and other personal protective equipment (PPE) shall be donned prior to entering a lead work area. A change room shall be provided for workers to don suits and other PPE with separate areas to store street clothes and personal belongings.
6. Eye protection for personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.
7. Goggles with side shields shall be worn when working with power tools, a material that may splash or fragment, or if protective eye wear is specified on the SDS for a particular product to be used on the project.

1.08 PERSONAL MONITORING

A. General

1. The Contractor shall be required to perform the personal air sampling activities during LBP disturbing work. The results of such air sampling shall be posted, provided to individual workers, and submitted to the Client, as described herein.

B. Air Sampling

1. Air samples shall be collected for the duration of the work shift or for 8 hours, whichever is less. If working conditions remain unchanged, personal air samples need not be collected every day after the first day; however, they must be collected each time there is a change in removal operations, either in terms of the location, or in the type of work. Sampling will be used to determine the 8-hour TWA. The Contractor shall be responsible for personal air sampling as outlined in OSHA Title 29 CFR, Parts 1910.1025 and 1926.62.
2. Air sampling results shall be reported to individual workers, in written form, no more than 48 hours after the completion of a sampling cycle. The reporting document shall list each sample's result, sampling time and date, personnel monitored and their social security numbers, flow rate, sample duration, sample yield, cassette size, and analyst's name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in $\mu\text{g}/\text{m}^3$.

C. Testing Laboratory

1. The Contractor's testing lab shall be currently participating in AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP). The Contractor shall submit to the Consultant for review and acceptance, the name and address of the laboratory, certification(s) of AIHA participation, a listing of relevant experience in air lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Any substitution in materials, equipment, or methods to those specified shall be approved by the Owner and Consultant prior to use. Any requests for substitution shall be provided in writing to the Owner and Consultant. The request shall clearly state the rationale for the substitution.
- B. Submit to the Owner and Consultant product data for all materials and equipment and material samples to be considered as an alternate.
- C. Product data shall consist of manufacturer catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, SDS, and other standard descriptive data. Submittal data shall be clearly marked to identify pertinent materials, products, or equipment and show performance characteristics and capacities.
- D. Samples shall be of sufficient size and quantity to clearly illustrate the functional characteristics of the product or material with integrally related parts and attachment devices.

2.02 MATERIALS AND PRODUCTS

- A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.
- B. Damaged or deteriorating materials shall not be used and shall be removed from the premises.
- C. The Contractor shall have a sufficient inventory of, or dated purchase orders for, materials necessary for the work (e.g., protective clothing, respirators, respirator filter cartridges, polyethylene (poly) sheeting of proper size and thickness, tape, spray adhesive, air filters, etc.).

D. Materials

1. Poly sheeting in a roll size to minimize the frequency of joints shall be delivered to the Site with factory label indicating 6-mil.
2. Poly disposable bags shall be 6-mil. Tie wraps for bags shall be plastic, five (5)-inches long (minimum), pointed and looped to secure filled poly bags.
3. Tape or spray adhesive will be capable of sealing joints in adjacent poly sheets and for attachment of poly sheeting to finished or unfinished surfaces of dissimilar materials and capable of adhering onto both dry and wet conditions, including use of amended water.
4. Impermeable containers are to be used to receive and retain any lead-containing or lead-contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with EPA and DOT standards.
5. HEPA-filtered exhaust systems shall be used during powered dust-generating removal operations. Using powered equipment without HEPA exhaust systems in-place on this Site is prohibited.

2.03 TOOLS AND EQUIPMENT

- A. Provide suitable tools for all LBP disturbing operations.
- B. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and/or electrical power sources (e.g., generators, etc.). Any electrical-connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, permitted as required.
- C. HEPA-Vacuum Equipment, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION MEETING

- A. At least one week prior to the start of work, a Pre-Construction Meeting will be scheduled and must be attended by the Contractor and any Subcontractors. The assigned Contractor Site Supervisor must attend this meeting.

- B. The Contractor shall present a detailed project schedule and project submittal package at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed, and the Owner and Consultant will inform the Contractor of any scheduling adjustments for this project.
- C. Following the Pre-Construction Meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

3.02 WORKER PROTECTION/TRAINING

- A. The Contractor shall provide appropriate training, PPE, and biological monitoring for each worker and ensure proper usage during potential lead exposure and the initial exposure assessment.

3.03 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall be responsible for establishing and maintaining controls referenced herein to prevent lead contamination outside the lead work area.
- B. The Contractor shall also be responsible for conducting work with applicable federal, state, and local regulations as referenced herein.

3.04 WORKER HYGIENE PRACTICES (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA AL)

- A. Work Area Entry
 - 1. Workers shall don PPE, including respiratory protection, disposable coveralls, gloves, headgear, and footwear, prior to entering the work area.
- B. Work Area Departure
 - 1. While leaving respirators on, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to change room to remove coveralls and footwear and place in hazardous waste disposal container.
- C. Hand-Washing Facilities
 - 1. All workers must wash their hands and faces upon leaving the work area.
- D. Equipment
 - 1. All equipment used by workers inside the work area shall be wet-wiped or bagged for future decontamination before removal from the work area.

- E. Prohibited Activities
 - 1. Under no circumstances shall workers eat, drink, smoke, chew gum or tobacco, apply cosmetics, or remove their respirators in the work area.
- F. Shock Hazards
 - 1. The Contractor shall be responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground-fault circuit interrupters (GFCI).

3.05 LEAD WORK AREA (REQUIRED DURING INITIAL EXPOSURE ASSESSMENT AND IF RESULTS OF AIR SAMPLING ARE ABOVE OSHA AL)

- A. The Contractor shall place lead warning signs at all entrances and exits from the work area. Signage shall be a minimum of 20" x 14" and shall state the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING OR DRINKING
UNAUTHORIZED ENTRY PROHIBITED

- B. The Contractor shall designate a change room as specified in this Section. The change room shall consist of 2 layers of 6-mil poly sheeting on the floor surface adjacent to the lead work area. The change room shall have separate storage facilities for street clothes to avoid cross-contamination.
- C. The Contractor shall provide potable water for hand and face washing.
- D. The Contractor shall place 6-mil poly sheeting on floor/ground surfaces prior to beginning removal work to facilitate clean-up.

3.06 WORK AREA CLEAN-UP

- A. The Contractor shall remove all loose chips and debris from floor surfaces and place in hazardous waste disposal bags.
- B. The Contractor shall clean adjacent surfaces using HEPA-vacuum equipment to remove dust and debris.
- C. Poly sheeting shall be cleaned and properly disposed as general construction and demolition waste.

3.07 WASTE DISPOSAL

- A. The Contractor's contractual liability shall be the proper disposal of all wastes generated at the Site in accordance with all applicable federal, state, and local regulations as referenced herein.
 - 1. The Contractor shall be responsible for collecting a waste characterization sample for TCLP analysis, as is required by the designated disposal site. Results of the TCLP analysis shall be forwarded by the Contractor to the Consultant prior to the waste being transported off-Site.

3.08 CONSULTANT

- A. The Owner may retain a Consultant for the purpose of construction administration and project monitoring during demolition work at the Site.
- B. The Consultant will represent the Owner in all tasks of the project at the discretion of the Owner.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 02 84 16

LIGHTING BALLASTS AND MERCURY MANAGEMENT

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 00 00 as part of this Section.
- B. Hazardous Building Materials Inspection Report prepared by Fuss & O’Neill EnviroScience, LLC (August 12, 2014).

1.02 SUMMARY OF WORK

- A. Work outlined in this Section includes all work necessary for the removal, packaging, transporting, and disposing of fluorescent lighting ballasts and mercury-containing bulbs impacted during demolition activities (the “Work”) to occur at the former West Bay Elementary School and the Osterville Community Center located on West Bay Road in Osterville, Massachusetts (the “Site”).
- B. All Work associated with the Osterville Community Center is part of Add Alternate 1.
- C. Fluorescent Light Ballasts: Work of this Section includes, but is not necessarily limited to, all that is necessary for complete proper removal, packaging, transportation, and disposal/reclamation of all Polychlorinated Biphenyls (PCB) or Non-PCB diethylhexyl phthalate (DEHP)-containing ballasts. Work shall be performed related to selective demolition work necessary to facilitate renovations. Ballasts that are to be removed shall be recycled/disposed as (presumed) DEHP-containing electrical equipment. Include a bid quantity of seven drums for fluorescent light ballast disposal/recycling.
- D. Fluorescent Lamps and Mercury Equipment: Work of this Section includes, but is not necessarily limited to, all that is necessary for complete proper removal, packaging, transportation, and disposal/recycling/reclamation of all presumed mercury-containing fluorescent lamps and mercury equipment which includes mercury-containing thermostats that exist in the interior of the building(s) to be renovated. Fluorescent lamps that are to be removed shall be recycled/disposed as Universal Waste. The Contractor shall coordinate removal in accordance with requirements of the electrical and mechanical work specified elsewhere. Include a bid quantity of fifteen fifty-count boxes for fluorescent lamp disposal/recycling.

- E. The extent of electrical demolition is specified elsewhere in the contract documents and the Contractor shall coordinate this Section with other Sections for the actual quantities of the work required. Only ballasts on light fixtures proposed for demolition require removal.
- F. The Contractor is responsible for verifying actual quantities of the above items that will require removal and disposal. This verification shall include an on-site walkthrough of the work areas, and visually inspecting ballasts for the presence of labels indicating "No PCBs". If ballasts do not have labels indicating "No PCBs" they shall be disposed/recycled as presumed PCB-containing electrical equipment. If ballasts have labels indicating "No PCBs," but do not have a listed manufacture date subsequent to 1991, they shall be disposed/recycled as presumed DEHP-containing electrical equipment.

1.03 DEFINITIONS

- A. The following definitions apply:
 - 1. Architect: CBI Consulting, Inc.
 - 2. CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act
 - 3. Consultant: Fuss and O'Neill EnviroScience, LLC.
 - 4. DOT: The Department of Transportation.
 - 5. EPA: The United States Environmental Protection Agency.
 - 6. OSHA: The Occupational Safety and Health Administration.
 - 7. Owner: Town of Barnstable.
 - 8. RCRA: The Resource Conservation and Recovery Act (EPA Title 40 CFR, Parts 260 - 265).
 - 9. Site: The former West Bay Elementary School and Osterville Community Center located on West Bay Road in Osterville, Massachusetts.

1.04 REGULATIONS AND STANDARDS

- A. The following regulations and standards of federal and state agencies apply to ballast disposal, and are made part of this Section by reference.
 - 1. Toxic Substance Control Act (TSCA) (EPA Title 40 CFR, Part 761).
 - 2. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA - Superfund Law).
 - 3. Department of Transportation (DOT) regulations - DOT regulation HM-181 regulates transportation of hazardous materials, including PCBs.
 - 4. Occupational Safety and Health Administration (OSHA) - OSHA regulates workers' safety and exposure to a variety of chemicals including PCBs.

5. Resource Conservation and Recovery Act (RCRA) - EPA Title 40 CFR, Part 261 regulates wastes which fail Toxic Characteristic Leaching Procedure (TCLP) and that contain greater than fifty parts per million (> 50 ppm) of PCBs.
- B. The following regulations and standards of federal and state agencies apply to Universal Waste (i.e., fluorescent lamps) disposal and mercury-containing equipment are made part of this Section by reference.
1. RCRA – EPA Title 40 CFR, Part 261, Subpart C.
 2. RCRA – Title 40 CFR, Part 273.
 3. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA - Superfund Law).
 4. DOT Regulations – Pipeline and Hazardous Materials Safety Administration Regulation Title 49 CFR, Parts 100 - 185 as applicable.
 5. OSHA – Title 29 CFR, Part 1910.1200 Hazard Communications and Part 1926.65.

1.05 SUBMITTALS

- A. The Contractor shall submit the following submittals to the Hazardous Building Materials Consultant prior to start of work:
1. Proposed transporter name, address, DOT license, and certificate of insurance for PCB and non-PCB wastes generated as part of the project.
 2. Proposed disposal/recycling facility proposed for PCB and non-PCB waste generated as part of the project. This includes name, address, operating permit and certificate of insurance.
 3. Proposed transporter name, address, DOT license, and certificate of insurance for mercury-containing universal wastes generated as part of the project,
 4. Proposed disposal/recycling facility name, address, DOT license, and certificate of insurance proposed for mercury-containing waste generated as part of the project.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.
- B. Disposal drums shall be DOT 17-C or 17-H.

- C. Light tube and lamp boxes shall be provided by the reclamation facility. Only new boxes shall be used.

PART 3 – EXECUTION

3.01 BALLAST REMOVAL AND PACKAGING

- A. The Contractor shall remove all ballasts from light fixtures with care.
- B. The Contractor shall pack all ballasts in appropriately sized containers or drums with care, so as not to cause ballasts to leak as a direct result of removal and packing.
- C. The Contractor shall segregate all leaking ballasts from non-leaking ballasts, separately package leaking ballasts in plastic bags and individually placed in properly-labeled drums.
- D. The Contractor shall label all drums properly. The Contractor shall supply labels. Labels shall contain the following information:
 - 1. Drum contents.
 - 2. DOT description.
 - 3. Name, address, and telephone number of the Owner (i.e., the Generator).
 - 4. Emergency telephone numbers.
 - 5. Date on which drum was filled with ballasts.
 - 6. Class 9 label.
- E. The Contractor shall ensure that no other materials or wastes are in the drums except the fluorescent light ballasts.
- F. The Contractor shall not load any single drum with more than 750 pounds of gross weight.
- G. The Contractor shall not use any absorbent material to pack ballasts in drums.
- H. The Contractor shall not use any plastic liners in drums.
- I. Each drum shall be sealed and stored in a secure (i.e., locked) area to minimize inadvertent damage or vandalism.
- J. The ballasts shall be removed by personnel wearing chemically-resistant gloves, eye protection, and proper respiratory protection.

3.02 BALLAST DISPOSAL

- A. At the completion of the removal phase, a licensed transporter shall haul either PCB or non-PCB waste generated by the project work. Chain-of-custody records shall be maintained which include the date removed from the Site, total number of drums, transporter name, and disposal site name and address. The Contractor shall be responsible for all disposal costs associated with the waste generated during this project.
- B. The Contractor shall provide Certificate(s) of Recycling and Disposal (CRD) pursuant to EPA Title 40 CFR, Part 761, Subpart K.
- C. The Contractor shall provide waste manifests for all PCB and non-PCB wastes generated and disposed from the project site. The Owner shall be provided sufficient time to identify agent for signatures on waste documentation. Contractor shall provide waste manifest to generation and destination state as required and provide Owner (Generator copy to Agent signing manifests).

3.03 COLLECTION AND CONTAINMENT MERCURY LAMPS AND EQUIPMENT

- A. All fluorescent lamps to be removed are to be considered mercury-containing. Lamps are to be handled by personnel wearing gloves and eye protection for protection against glass breakage, and proper respiratory protection. Lamps are to be stored unbroken in DOT-approved containers that protect the lamps against breakage.

3.04 MERCURY LAMPS AND EQUIPMENT STORAGE AND DISPOSAL/RECYCLING

- A. Each container shall be sealed and stored in a secure area to minimize inadvertent damage or vandalism. Each lamp or a container or package in which such lamps are contained must be labeled or marked clearly with one of the following phrases: "Universal Waste -- Lamp(s)," "Waste Lamp(s)," or "Used Lamp(s)".
- B. At the completion of the mercury removal phase, a licensed transporter shall haul mercury-containing waste for disposal/recycling of the mercury waste. Chain-of-custody records shall be maintained that include the date removed from the Site, the number of containers, the name of mercury transporter, and the destination of mercury waste disposal. The Contractor shall be responsible for all disposal/recycling costs associated with the mercury waste generated during this project.

DEMOLITION OF FORMER OSTERVILLE BAY SCHOOL AND
OSTERVILLE COMMUNITY CENTER
HYANNIS, MASSACHUSETTS
CBI JOB NO: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

- C. The Owner shall be provided a minimum of 72-hour notice of requirement for signature to identify agent for signatures on waste documentation. Contractor shall provide waste manifest to generation and destination state as required and provide Owner (Generator copy to Agent signing manifests) and Hazardous Materials Consultant.

END OF SECTION

DIVISION 22

PLUMBING

SECTION 22 00 00

PLUMBING

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the Plumbing Work required to complete the Work of the Contract including all the Plumbing Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the Plumbing Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Plumbing Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. Plumbing Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

C. The following is the Plumbing system demolition narrative which provides general information on the existing plumbing components within the buildings.

1. Plumbing Building Components - Osterville Bay School:

Presently, the Plumbing Systems serving the building are domestic cold water, sanitary, waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the Building.

Prior to building demolition, General Contractor shall contact Gas Utility Company and Local Water and Sewer Departments. General Contractor to coordinate capping of existing gas, sewer, and water in Town right-of-way prior to demolition of building.

2. Plumbing Building Components-Osterville Community Center:
Add Alternate #1:

Presently, the Plumbing Systems serving the building are domestic cold water, sanitary, waste and vent system, storm drain piping, and natural gas. Municipal sewer and municipal water service the Building.

Prior to building demolition, General Contractor shall contact Gas Utility Company and Local Water and Sewer Departments. General Contractor to coordinate capping of existing gas, sewer, and water in Town right-of-way prior to demolition of building.

3. Demolition:

The General Contractor shall perform all demolition work. All plumbing systems shall be demolished. The General Contractor shall make safe the building prior to any building demolition. The General Contractor shall be responsible to coordinate with utilities and to cap or plug gas, water, storm, and sanitary drainage at a minimum of 10 feet outside building or at the service main in the Right-of-Way.

END OF SECTION

DIVISION 23

HVAC

SECTION 23 00 00

HVAC

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the HVAC Work required to complete the Work of the Contract including all the HVAC Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the HVAC Work with all the other trades for the project. Provide all demolition and disposal Work to complete the HVAC Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. HVAC Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required

in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

C. The following is the HVAC system demolition narrative which provides general information on the existing HVAC components within the Osterville Bay School and the Osterville Community Center buildings.

1. Heating, Ventilation & Air Conditioning Building Components – Osterville Bay School Demolition and Salvage:

- a. The building is currently abandoned by the town therefore all HVAC related components have been deactivated, winterized and are not operating. All power and fuel sources are still connected to the existing equipment. General contractor shall ensure that all components are disconnected from all utilities and all components shall be made safe for demolition. Underground fuel oil tank shall be drained and removed per NFPA and all local, state and federal laws.
- b. The General Contractor shall demolish existing heating equipment (i.e. unit ventilators, radiation, exhaust fans, pumps, etc.) which shall include all associated piping, valves, wiring, controls, hangers, associated ductwork, and all associated appurtenances. Where existing piping (i.e. water, steam, condensate, drain etc.) and ductwork are demolished it shall include all associated hangers, insulation, valves, controls, dampers and all associated appurtenances. This contractor shall disconnect, lower to floor and remove components from the building and dispose of in a legal manner.
- c. The main HVAC related components within the building are as follows;
 - i. One gas fired cast iron steam boiler manufactured by Peerless Boiler Company and related appurtenances including an abandoned 10,000 gallon underground fuel oil tank. The gas fired cast-iron steam boiler is to be salvaged and cleaned and delivered to Structures and Grounds Division of the Department of Public Works, 800 Pitchers Way, Hyannis, MA. Coordinated delivery time with the Owner's project manage two (2) weeks prior to scheduled delivery.
 - ii. Pneumatic temperature controls including air compressor, pneumatic tubing, wall mounted thermostats, pneumatic

control valves and pipe mounted temperature sensors
(Johnson Controls)

- iii. Vertical and horizontal classroom unit ventilators and associated ductwork, piping and controls.
- iv. Fin tube radiation and associated piping and controls.
- v. Cabinet Unit heaters and associated piping and controls.
- vi. Indoor Air Handling Units and associated ductwork, grilles, piping and controls.
- vii. Exhaust fans and associated ductwork and controls.

2. Heating, Ventilation & Air Conditioning Building Components – Osterville Community Center: Add Alternate #1:

- a. The building is currently in use by the town therefore all HVAC related components are functional and operating. All power and fuel sources are connected to the existing equipment. General contractor shall ensure that all components are disconnected from all utilities and all components shall be made safe for demolition.
- b. The General Contractor shall demolish existing heating equipment (i.e. unit ventilators, radiation, exhaust fans, pumps, boilers etc.) which shall include all associated piping, valves, wiring, controls, hangers, associated ductwork, and all associated appurtenances. Where existing piping (i.e. water, steam, condensate, drain etc.) and ductwork are demolished it shall include all associated hangers, insulation, valves, controls, dampers and all associated appurtenances. This contractor shall disconnect, lower to floor and remove components from the building and dispose of in a legal manner.
- c. The main HVAC related components within the building are as follows;
 - i. Two gas fired indoor forced hot air furnaces manufactured by Lennox Company and associated ductwork, grilles and controls.
 - ii. Standalone electronic temperature controls and wall mounted thermostats (Honeywell)
 - iii. Electric cabinet unit heaters and associated wiring and controls.

DEMOLITION OF FORMER OSTERVILLE
BAY SCHOOL AND OSTERVILLE COMMUNITY CENTER GYM
HYANNIS, MASSACHUSETTS
CBI JOB NO.: 16165-A

CBI Consulting Inc.
Boston, Massachusetts
Tel: (617) 268-8977
Fax: (617) 464-2971

iv. Exhaust fans and associated ductwork and controls.

END OF SECTION

DIVISION 23

ELECTRICAL

SECTION 23 00 00

ELECTRICAL

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect Work of this Section whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other trades affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the Work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the HVAC Work required to complete the Work of the Contract including all the HVAC Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the HVAC Work with all the other trades for the project. Provide all demolition and disposal Work to complete the HVAC Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. HVAC Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

C. The following is the Electrical system demolition narrative which provides general information on the existing electrical components within the building.

1. Electrical Building Components - Osterville Bay School:

- a. The building is currently abandoned by the town therefore all Electrical related components are functional and operating. The Electrical Contractor shall contact the utility company and fill out a removal of service work order and coordinate disconnection with the utility company. The Electrical Contractor shall remove and make safe the existing service for general demolition by the General Contractor. The General Contractor shall demolish all electrical equipment once the building has been made safe. The electrical equipment shall be properly disposed of per DEP/EPA requirements.
- b. The Electrical systems to be demolished by General Contractor consist of the following:
 - i. Electrical Distribution Equipment
 - ii. Light fixtures which a majority consist of T12 fluorescent lamps and electronic ballasts.
 - iii. Branch circuit wiring
 - iv. Fire alarm system
 - v. Communication wiring
 - vi. Exterior lighting

2. Electrical Building Components - Osterville Community Center:

Add Alternate #1:

- a. The building is currently in use by the town therefore all Electrical related components are functional and operating. The Electrical Contractor shall contact the utility company and fill out a removal of service work order and coordinate disconnection with the utility company. The Electrical Contractor shall remove and make safe the existing service for general demolition by the General Contractor. The General Contractor shall demolish all electrical equipment once the building has been made safe. The electrical equipment shall be properly disposed of per DEP/EPA requirements.
- b. The Electrical systems to be demolished by General Contractor consist of the following:

- i. Electrical Distribution Equipment
 - ii. Light fixtures which a majority consist of T12 fluorescent lamps and electronic ballasts.
 - iii. Branch circuit wiring
 - iv. Fire alarm system
 - v. Communication wiring
 - vi. Exterior lighting
3. Phasing, Demolition and Maintaining Existing Services:
- a. During the execution of the work, required relocation, rerouting, etc., of existing equipment and systems in the existing building areas where new work is to be installed or new connections are scheduled to be made, shall be performed by the Electrical Subcontractor, as required by job conditions and as determined by the Architect in the field, to facilitate the installation of the new system, while demolition, relocation work or new tie-ins will be performed. Outages required for construction purposes shall be scheduled for the shortest practical periods of time, in coordination with the Owner's designated representative, for specified, mutually agreeable periods of time, after each of which the interruption shall cease and the service shall be restored. This procedure shall be repeated to suit the Owner's working schedule, as many times as required until all work is completed. Any outages of service shall be approved by the Owner, prior to commencing the work. No outages or shutdowns of service shall occur without the written authorization of the Owner prior to commencing the work. Give notice of any scheduled shutdowns, a minimum of (2) weeks in advance. Owner shall make their best efforts to meet this request without adversely affecting the electric service to the existing building.
 - b. Prior to any deactivation and relocation or demolition work, consult the drawings and arrange a conference with the Architect and the Owner's representative in the field to inspect each of the items to be deactivated, removed or relocated. Care shall be taken to protect all equipment designated to be relocated and reused or to remain in operation and be integrated with the new systems.
 - c. Where existing outlets are to be reused and are cut off by the remodeling, they shall be reconnected to existing circuits as required

by field conditions. Where existing outlets are to be abandoned, they shall be removed and blank plates installed.

- d. All deactivation, relocation and temporary tie-ins of electrical systems and equipment shall be provided by the Electrical Subcontractor. All demolition of electrical systems and equipment designated to be demolished shall be provided by the Electrical Subcontractor. Stack all demolished electrical materials nearby in an area designated by the General Contractor for removal by the General Contractor. All hazardous electrical materials shall be legally disposed by the General Contractor. General Contractor will be responsible for removal of the PCB ballasts and lamps from the light fixtures.
- e. The Owner reserves the right to inspect the material scheduled for removal and salvage any items he deems usable as spare parts.
- f. Phasing:
 - i. The Electrical Sub-contractor shall construct the project in phases as directed by the Architect to suit the project progress schedule, as well as the completion date of the project.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 31 10 00

SITE CLEARING

PART 1-GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Protecting existing trees and vegetation to remain, including temporary fencing for trees in close proximity to construction operations.
 2. Removing existing trees and vegetation indicated to be removed.
 3. Clearing and grubbing.
 4. Stripping and stockpiling topsoil.
 5. Removing above and below grade site improvements.
 6. Protection of Existing Utilities.
 7. Utility Demolition as required to accommodate new construction.
 8. Protection and Abandonment of Utilities.
 9. Disconnecting, capping or sealing of utilities as required.
- B. Alternate #1:
1. Remove gas line
 2. Remove grease trap and sewer lines
 3. Remove tree
 4. Remove 1-story brick building and foundation. Fill with on-site material as directed by owner. Grub area around building and move to area designated by the owner.
- C. Items To Be Installed Only: Not Applicable.
- D. Items To Be Furnished Only: Not Applicable.
- E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 312000 – EARTH MOVING for soil materials, excavating, backfilling, and site grading and removal of site utilities.
2. Section 312500 – EROSION AND SEDIMENTATION CONTROLS for required erosion and sedimentation control measures.

1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain the Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

- A. Refer to SECTION 013300 – SUBMITTALS for submittal provisions and procedures.
 1. Schedule indicating proposed sequence of operations for demolition work for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise protection.
 - a. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on site operations.
 - b. Coordinate with Owner's continuing occupation of portions of existing building, adjacent buildings, and with Owner's partial occupancy of completed portions of proposed building or additions.
 2. Preconstruction survey photographs sufficiently detailed, of existing conditions of existing buildings, trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Record drawings, according to Section 017700 - CONTRACT CLOSEOUT identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner's Representative and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on the Owner's premises where indicated.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- D. Do not commence site clearing operations until erosion and sedimentation control measures are in place.
- E. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place or outside of the limit of work. Protect improvements on adjoining properties and on the Owner's property.
 - 1. Restore improvements damaged by Contractor's clearing activities to their original condition, at no additional expense to the Owner.

1.7 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of a lack of knowledge of existing conditions as indicated in the Construction Documents, or obvious from observation of the site.
- B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

PART 2-PRODUCTS (NOT USED)

PART 3-EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.

- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to the Owner's Representative.

3.2 TREE PROTECTION

- A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.
 - 1. Do not store construction materials, debris, or excavated material within fenced area.
 - 2. Do not permit vehicles, equipment, or foot traffic within fenced area.
 - 3. Maintain fenced area free of weeds and trash.
 - 4. Except as otherwise directed, cutting and trimming of existing trees will not be permitted.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
 - 1. Cover exposed roots with burlap and water regularly.
 - 2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 - 4. Backfill with soil as soon as possible.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Designer.
 - 1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
 - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the Designer.

3.3 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
 - 1. Arrange with utility companies to shut off indicated utilities. The Contractor is responsible for coordinating and scheduling with the authorities having

jurisdiction the removal and/or abandonment of existing utilities as required to complete the work.

- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner's Representative or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify the Owner's Representative not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without the Owner's Representative's written permission.
- C. Utility pipes designated to be abandoned in place shall be plugged at their ends with watertight brick masonry or cement mortar with a minimum thickness of 8 inches.
- D. Utility pipes designated to be removed shall consist of the complete removal and disposal of the entire length of pipe and backfill and compaction of the void with common fill. When the void is within the footprint of the new building, structural fill shall be used to backfill the void.
- E. Utility structures designated to be abandoned in place shall have their cast iron castings removed and disposed, inlet and outlet pipes plugged, the bottom of the structures shall be broken, the void of the structure shall be backfilled and compacted with common fill, and the top of the structure shall be removed so that it is at least 36 inches below finished grade.
- F. Utility structures designated to be removed shall consist of the removal and disposal of cast iron castings, plugging of inlet and outlet pipes, removal of the structure, and backfill and compaction of the void with common fill. When the void is within the footprint of the new building, structural fill shall be used to backfill the void.

3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
 - 4. Use only hand methods for grubbing within tree protection zone.
 - 5. Chip removed tree branches and dispose of off-site.

- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust or contamination by air-borne weed seed.
 - 1. Limit height of topsoil stockpiles to 72 inches.
 - 2. Do not stockpile topsoil within tree protection zones.

3.6 EXCESS TOPSOIL

- A. Topsoil that has been stripped and stockpiled, but is not needed after the completion of all final topsoil spreading and grassing, shall be removed and legally disposed of offsite by the Contractor per local, state, and federal standards.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.8 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off the Owner's property.
 - 1. Burning on site is prohibited.

2. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

3.9 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site.
- B. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by site demolition work.

END OF SECTION

DIVISION 03

EXISTING CONDITIONS

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section (excluding earthwork for building and retaining wall construction), including but not limited to the following:
1. Excavation, backfill, and compaction for pavements, pads, utility trenches and structures, and landscaping.
 2. Preparation and protection of subgrades.
 3. Removal of underground utilities as applicable.
 4. Excavation of all unsuitable materials encountered below indicated subgrade elevations.
 5. Placement of subbase course for concrete pavements.
 6. Placement of subbase and base course for asphalt paving.
 7. Bedding for utility trenches.
 8. Dewatering and support of excavation of trenches and excavations.
 9. Removal of items covered by Section 012200 - UNIT PRICES as applicable.
 10. Disposal of unsuitable or excess excavated material.
 11. Coordinate with all trades for complete building and site utility systems.
 12. Coordination with maintenance of safe path of travel for the public.
- B. Alternate #1:
- a. Remove gas line
 - b. Remove grease trap and sewer line
 - c. Remove tree
 - d. Remove 1-story brick building and foundation. Fill with on-site material as directed by owner
- C. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. SECTION 31 20 00 - EARTHWORK for building related soil materials, excavating and backfilling requirements.
2. SECTION 311000 - SITE CLEARING for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements.
3. SECTION 312500 – EROSION AND SEDIMENTATION CONTROLS for temporary erosion and sedimentation control measures.
4. Division 02, 22, 23, and 26 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

1.3 DEFINITIONS

- A. Backfill: Soil material or Controlled Density Fill (CDF) used to fill an excavation.
 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Course placed between the subbase course and hot-mix asphalt paving and concrete paving.
- C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture of heaving of the bottom of any excavation; and disposing of pumped water.
 1. Normal dewatering is defined as using conventional pumps installed in open excavations ditches, or sumps.
- F. Drainage Course: Course supporting the pavement that also minimizes upward capillary flow of pore water.
- G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Owner's Representative or the Designer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
 2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner's Representative or the Designer. Unauthorized excavation, as well as remedial work directed by Designer, shall be without additional compensation.
- H. Fill: Soil materials used to raise existing grades.
- I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material as defined in Section 31 23 16, Rock Removal, that cannot be removed by normal rock excavating equipment without systematic drilling, ram hammering, ripping, or blasting, when permitted.
- J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- K. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- L. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- M. Utilities: Onsite underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- N. Unsuitable Soils: Excavated soils that are determined by the Designer to not be reusable as fill or backfill on-site due to gradation, moisture content, and/or the presence of deleterious materials.

1.4 SUBMITTALS

- A. Product Data: For the following:
1. Each type of plastic warning tape.
 2. Geotextile.
 3. Controlled Density Fill, including design mixture.

- B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
 2. Laboratory compaction curve according to ASTM D 1557 for each on-site and borrow soil material proposed for fill and backfill.
- C. Dewatering system: Contractor shall submit, for record, drawings and design data prepared, stamped, and signed by a registered professional engineer in the Commonwealth of Massachusetts who is experienced in groundwater control system design. The submittal shall show arrangement locations, and details of wells and well points and sump pumps; locations of risers, headers, filters, pumps, power units, all treatment components, and discharge lines; and means of discharge, control of sediment, and disposal of water. The submittal of the dewatering system will not relieve the Contractor from the responsibility for the adequacy of the dewatering system to achieve the required results specified in these Specifications and all permit requirements.
1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
 2. Include a written plan for dewatering operations including control procedures to be adapted if dewatering problems arise.
 3. Include design calculations demonstrating adequacy of the proposed dewatering system and equipment.
 4. Provisions and methods of sediment removal and disposal of water.
 5. All permits required for the work.
- D. Support of Excavation: Contractor shall submit, for record, proposed excavation support systems (if required). The proposed lateral support systems shall be designed and stamped by a registered professional engineer licensed in the Commonwealth of Massachusetts. Despite the submittal of the design of excavation support and protection systems, the Contractor shall remain solely responsible for the adequacy and safety of materials and methods used in construction. Include the following as a minimum on the drawings:
1. Details, arrangements and methods of construction of the proposed system(s).
 2. The method of installation and installation equipment.
 3. The elevation of struts, shores, and tiebacks, as applicable, and permissible depth to which excavation may be carried before such supports are installed.

4. The excavation depths, the depth below the main excavation to which the support system will be installed, and the maximum design load to be carried by various members of the support system.
 5. Design calculations including references to design methods used, assumptions, design parameters, design soil profile, material properties, allowable stresses, and other pertinent information stamped by a Professional Engineer registered in the Commonwealth of Massachusetts.
 6. The location of existing utilities, facilities and/or structures nearby.
- E. Preexcavation Photographs and Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins. Maintain catalog of up-to-date photographs at the site.
- F. Plan to Maintain Safe Path of Travel: Submit plans for maintaining safe paths of travel for the general public during the entire project, including requirement for police details of necessary.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the Owner or others unless permitted in writing by the Owner's Representative and then only after arranging to provide temporary utility services according to requirements indicated.
1. Notify the Owner's Representative not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the Owner's Representative's written permission.
 3. Contact utility-locator service for area where Project is located before excavating.
 - a. The Contractor shall notify "Dig Safe" at 1-888-DIG-SAFE prior to commencing any excavation work.
- B. Demolish and completely remove from site existing underground utilities and structures indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- C. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Neither the Owner nor the Geotechnical Engineer will be responsible for interpretations or conclusions drawn from the data.

1. The geotechnical report does not represent, and shall not be construed to represent a guarantee of subsurface conditions.
 2. Interpretation of this data for purposes of construction is the responsibility of the Contractor. It is the Contractor's responsibility to make interpretations and draw conclusions with respect to the character of materials to be encountered and groundwater conditions at the site and their impact upon Contractor's work based on his expert knowledge of the area, construction dewatering methods, and support of excavation methods.
 3. Make additional test borings and conduct other exploratory operations necessary for dewatering and excavation support and protection.
 4. The geotechnical report is referenced elsewhere in the Project Manual.
- D. Survey Work: Contractor shall engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
1. During earth moving operations, installation of excavation support and protection systems and dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Owner's Representative if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
- E. The Contractor shall not close or obstruct any street, sidewalk, or passageway without written permission from authorities having jurisdiction unless otherwise indicated on the Contract Drawings. The Contractor shall conduct the construction operations as to minimize interference with the use of roads, driveways, or other facilities near enough to the project to be affected by the work.
- F. The Contractor shall provide police details when working in roadways as required by local jurisdictional authorities. The Contractor shall pay for any and all police details.

1.6 EXCAVATION SUPPORT AND PROTECTION

- A. The Contractor shall furnish, install, monitor and maintain excavation support and protection systems (sheeting, shoring, and bracing) at locations necessary to support the sides of excavations and resist soil and hydrostatic pressure and superimposed and construction loads; to prevent danger to persons or damage to adjacent pavements, facilities, utilities, or structures; to prevent injurious caving or erosion or the loss of ground; and to maintain pedestrian and vehicular traffic as required by the Contract Documents, the

Contractor's sequence of construction, and as directed by the Owner's Representative.

- B. In all sheeting, shoring and bracing operations, care shall be taken to prevent collapse of excavations, injury to persons or damage to adjacent structures, facilities, utilities and services. Any injuries to persons shall be the responsibility of the Contractor; and any damage to the work occurring as a result of settlement, water or earth pressure, or other causes due to inadequate bracing or other construction operations of the Contractor shall be satisfactorily repaired and made good by the Contractor, at no additional cost to the Owner.
- C. The excavation support system shall be of sufficient strength and be provided with adequate bracing to support all loads to which it will be subjected. The excavation support system shall be designed to prevent any movement of earth that would diminish the width of the excavation or damage or endanger adjacent structures.
- D. Where sheeting is to be used, it shall be driven ahead of excavation operations to the extent practicable so as to avoid the loss of material from behind the sheeting; where voids occur outside of the sheeting, they shall be filled immediately with ordinary fill, thoroughly compacted.
- E. The Contractor shall leave in place all sheeting and bracing at the locations and within the limits ordered by the Owner's Representative in writing. The Contractor shall cut off the sheeting at elevations as indicated on the Contract Drawings or to be determined with the approval of the Owner's Representative.
- F. The Contractor shall comply with all federal, state, and local safety regulations, and requirements.

1.7 DEWATERING

- A. The Contractor shall provide, at his own expense, adequate pumping and drainage facilities to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. The flows of all water resulting from pumping shall be managed so as not to cause erosion, siltation of drainage systems, or damage to adjacent property.
- B. Any damage resulting from the failure of the dewatering operations of the Contractor, and any damage resulting from the failure of the Contractor to maintain all the areas of work in a suitable dry condition, shall be repaired by the Contractor, as directed by the Owner's Representative and/or the Designer, at no additional cost to the Owner. The Contractor's pumping and

dewatering operations shall be carried out in such a manner as to prevent damage to the Contract work and so that no loss of ground will result from these operations. Precautions shall be taken to protect new work from flooding during storms or from other causes. Pumping shall be continuous to protect the work and/or to maintain satisfactory progress.

- C. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water from the trenches, excavations, and stormwater management operations shall be disposed of in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.
- D. The Contractor shall control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, temporary ditches shall be provided to control drainage. Upon completion of the work and when directed, all areas shall be restored by the Contractor in a satisfactory manner and as directed.
- E. Remove dewatering system when no longer required for construction.
- F. The Contractor shall obtain and maintain all required local, state, and federal permits necessary for construction dewatering for the duration of dewatering activities including all chemical testing required for disposal and discharge of dewatering effluent. The Contractor shall be responsible for treatment of water, if necessary, to meet minimum discharge criteria specified in the permits.

1.8 QUALITY CONTROL

- A. Inspection and testing will be performed by the Contractor to ensure that the materials placed meet the requirements in this section. Fill materials imported from off-site sources shall be chemically and geotechnically tested once for every 2,000 tons of material.
- B. If fill soils are not obtained from a commercial gravel pit, the Contractor shall provide certified analytical testing of offsite backfill to demonstrate that the soil does not exceed the limitations for MCP reference/reportable concentrations. Analyses shall include RCRA-8 metals, Extractable and Volatile Petroleum Hydrocarbons (EPH/VPH), and Volatile Organic Compounds (by EPA Method 8260B/5035). No testing will be required of imported fill soils obtained from a commercial gravel pit, provided the soils are free of odors, discoloration, staining or other conditions indicative of contamination, in the opinion of the Geotechnical Engineer and/or the Designer.

- C. Tests and analysis of soil material will be performed in accordance with ASTM D422, ASTM D1557, ASTM D2922, ASTM D3017 and ASTM D4318.
- D. If tests indicate materials do not meet specified requirements, the Contractor shall identify an alternative borrow source, test the new material, and submit results to the Designer at no cost to Owner.

1.9 LAYOUT AND GRADES

- A. The Contractor is responsible for establishing vertical and horizontal control for the work, and shall establish permanent bench marks and replace as directed any, which are destroyed or disturbed. The Contractor shall maintain sufficient reference points at all times during construction to properly perform site grading. The existing survey benchmark shall be protected throughout the construction project.
- B. Finished grades, contours, and elevations indicated on the Drawings describe final surface elevation for completed construction. The words “finished grade” as used herein shall mean final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas shall be given uniform slope between points and existing established grades.

1.10 QUALITY ASSURANCE

- A. Field inspection and testing may be performed by a Geotechnical Engineer at the Owner’s expense to supplement the Contractor’s Quality Control testing. Classification of all materials will be made by the Geotechnical Engineer whose decision shall be final and binding on the Contractor.
- B. The Contractor shall be responsible for managing and tracking all materials excavated and placed in stockpiles for testing.
- C. Comply with governing EPA notification regulations before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. The Contractor is responsible for the adequacy of the dewatering systems.
 - 1. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation bottom, unless otherwise directed by the Designer, so that all excavation bottoms are firm and dry.
 - 2. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenance to be built therein

- have been completed to the extent that they will not be floated or otherwise damaged.
3. The dewatering system and excavation support shall be designed so that the lowering of the groundwater level outside the excavation does not adversely affect adjacent structures, utilities or other improvements.
- E. The Owner will perform in place density tests in accordance with ASTM D2922 or D3017 as the Work progresses, to determine the degree of compaction. Any corrective work required as a result of such tests, such as additional compaction, or a decrease in the thickness of layers, shall be performed by the Contractor at no additional expense to Owner. In place density testing shall be made at the Contractor's expense by a qualified geotechnical testing laboratory.
- F. The Designer's duties do not include the supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Designer nor any observation and testing by the Geotechnical Engineer shall excuse the Contractor from defects discovered in his Work at that time or subsequent to the testing.
- G. Contractor shall assist the Owner's Testing Laboratory in performing in place density testing at a minimum frequency of one test per lift but no less than one test per 200 cubic yards of material placed in any one lift. Compaction testing will be performed in accordance with ASTM D1557, D2922, and D3017.
- H. Subgrades shall be approved for compactness and material composition prior to placing subsequent lifts. If inspections indicate Work does not meet specified requirements, the work shall be removed, replaced, and compacted at no additional cost to Owner.

1.11 REGULATORY REQUIREMENTS

- A. Comply with the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.). Contractors shall be familiar with the requirements of these regulations.
1. All excavations shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P), State, and local requirements. Where conflict between OSHA, State, and local regulations exists, the most stringent requirements shall apply.

- B. Comply with governing EPA notification regulations before, during, and upon completion of dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Comply with all rules, regulations, laws and ordinances of the municipality, the Commonwealth of Massachusetts, and other authorities having jurisdiction over the project site or work. All labor, materials, equipment and services necessary to make the work comply with requirements shall be provided by the Contractor without additional cost to the Owner.
- D. The Contractor shall obtain and pay for all permits and licenses required to complete the work specified herein and indicated on the Contract Drawings.

1.12 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the site.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

PART 2-PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Ordinary Borrow: Ordinary borrow shall meet the requirements of MassDOT M1.01.0. It shall be well-graded, natural inorganic soil contain-

ing no stone greater than 6 inches maximum dimension. The materials shall be free of trash, ice, snow, tree stumps, roots, and other organic and deleterious materials. It shall be free of highly plastic clays, of all materials subject to decay, or other materials that will corrode piping or metals. Ordinary borrow shall have a maximum dry density of not less than 110 pounds per cubic foot. It shall be of such a nature and character that it can be compacted to the specified densities. Topsoil shall not be considered ordinary borrow. Existing available fill materials from onsite excavations may be reused as ordinary borrow if it meets the above requirements. It shall be graded within the following limits:

<u>U. S. Standard Sieve Size</u>	<u>Percent Finer by Weight</u>
6 inch	100
No. 10	30-90
No. 40	10-70
No. 200	0-15

- E. Gravel Borrow: Gravel borrow shall meet the requirements of MassDOT M1.03.0, Type B. It shall be an inert, hard, durable sand and gravel or stone soil obtained from an offsite commercial source. It shall be free of ice, snow, roots, sod, rubbish, oil, hazardous material, and other deleterious or organic matter. It shall be graded within the following limits:

<u>U. S. Standard Sieve Size</u>	<u>Percent Finer by Weight</u>
3 inch	100
½ inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-8

- F. ¾" Crushed Stone: ¾" crushed stone shall meet the requirements of MassDOT M2.01.4. It shall consist of durable crushed rock or crushed gravel stone, free of ice, snow, sand, silt, clay, loam, shale, or other deleterious or organic matter. It shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1 inch	100
¾ inch	90-100
½ inch	10-50
3/8 inch	0-20
No. 4	0-5

- G. 1-1/2" Crushed Stone: 1-1/2" crushed stone shall meet the requirements of MassDOT M2.01.1. It shall consist of durable crushed rock or crushed gravel stone, free of ice, snow, sand, silt, clay, loam, shale, or other deleterious or organic matter. It shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
2 inch	100
1-1/2 inch	95-100
1 inch	35-70
3/4 inch	0-25

- H. Dense Graded Crushed Stone: Dense graded crushed stone shall meet the requirements of MassDOT M2.01.7. It shall consist of a mixture of crusher-run aggregate of crushed stone mixed with natural sand and gravel soil obtained from an offsite commercial source. It shall be free of ice, snow, roots, sod, rubbish, soil, hazardous material, and other deleterious or organic matter. It shall be graded within the following limits:

<u>U. S. Standard Sieve Size</u>	<u>Percent Finer by Weight</u>
2 inch	100
1-1/2 inch	70-100
3/4 inch	50-85
No. 4	30-55
No. 40	8-24
No. 200	3-10

- I. Sand: Sand shall meet the requirements of MassDOT M1.04.1. It shall consist of clean inert, hard, durable grains of quartz or other hard durable rock, free from clay, organics, surface coatings, or other deleterious or organic matter. It shall be graded within the following limits:

<u>U. S. Standard Sieve Size</u>	<u>Percent Finer by Weight</u>
1/2 inch	100
3/8 inch	85-100
No. 4	60-100
No. 16	35-80
No. 50	10-55
No. 100	2-10

- J. Dumped Riprap: Stone used for dumped riprap shall be hard, durable, angular in shape stones, resistant to weathering and shall meet the gradation re-

quirement specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted unless authorized by the Engineer. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified. Stone shall be free from overburden, spoil, shale, and organic material and shall conform to the following gradation with no more than 5% by weight passing a 2-inch sieve:

<u>Weight of Stone (lbs.)</u>	<u>Percent Finer by Weight</u>
400	100
300	50
200	30
25	10

- K. Stone for Pipe Ends: Stone for pipe ends shall be sound, curable rock which is angular in shape. Rounded stones, boulders, sandstone or similar stone or relatively thin slabs will not be acceptable. Each stone shall weigh not less than 50 pounds not more than 125 pounds and at least 75% of the volume shall consist of stones weighing not less than 75 pounds each. The remainder of the stones shall be so graded that when placed with the larger stones the entire mass will be compact.
- L. Controlled Density Fill (CDF) shall be a cement concrete backfill material that flows like a liquid, supports like a solid when cured, and levels without tamping or vibrating to reach 100 percent compaction. CDF shall meet the requirements of MassDOT Specifications M4.08.00 for Type 1E (Very Flowable, Excavatable) or type 2E (Flowable, Excavatable) CDF. The mix formulation will be submitted to the Designer for review prior to placement of the material in the project.
- M. Reuse of Excavated Rock: Excavated on-site rock materials processed by the Contractor meeting the gradation limits for 3/4" Crushed Stone, 1-1/2" Crushed Stone, Dense Graded Crushed Stone and Stone for Pipe Ends contained herein may be segregated and reused as approved by the Owner.

2.2 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 3. Sewn Seam Strength: 142 lbf; ASTM D 4632.
 4. Tear Strength: 56 lbf; ASTM D 4533.

5. Puncture Strength: 56 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
7. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 90 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

A. Detectable Underground Warning Tapes: Acid and alkali-resistant polyethylene plastic film warning tape, 6-inches wide by 4-mils minimum thickness, with continuously printed caption in black letters "CAUTION - xxxxx LINE BURIED BELOW." The text and color of the tape shall be as shown in the table below. The tape shall have a metallic core encased in a protective jacket for corrosion protection and be detectable by a metal detector when the tape is buried up to 2.5-feet deep.

Color	Utility
Safety Red	Electric
High Visibility Safety Yellow	Gas, Oil, Steam
Safety Alert Orange	Telephone, Communications, Cable Television
Safety Precaution Blue	Water System, Irrigation
Safety Green	Sanitary Sewer, Storm Sewer
White	Proposed Excavation

2.4 USES OF MATERIALS

- A. Fill materials listed in Paragraph 2.1 above shall be utilized as follows and as otherwise indicated on the Drawings, specified or directed.
- B. Gravel Borrow:

1. As fill and base coarse soils below cement concrete and hot-mix asphalt pavements as shown on the Contract Drawings.
 2. Trench backfill within paved areas.
 3. Bedding for ductile iron drain, water, and sewer piping.
- C. Dense Graded Crushed Stone:
1. As base course soils below cement concrete and hot-mix asphalt pavement as shown on the Contract Drawings.
- D. $\frac{3}{4}$ -inch and 1-1/2-inch Crushed Stone:
1. Base for drain manholes, catch basins, sewer manholes and utility structures.
 2. Bedding for drain pipe and sewer pipe.
 3. Around perforated drain lines.
 4. To stabilize wet subgrade conditions.
 5. Elsewhere as shown on the Drawings or specified herein.
 6. To aid in dewatering.
- E. Sand:
1. Bedding for drain, water, sewer, and other utility piping.
 2. Elsewhere as shown on the Drawings or specified herein.
- F. Ordinary Borrow:
1. For general site fill outside of the proposed building footprint, concrete, and bituminous concrete areas.
 2. Trench backfill material outside of paved areas.
 3. Elsewhere as shown on the Drawings or specified herein.
- G. Geotextiles:
1. Subsurface non-woven Drainage Geotextile shall fully wrap 3-4-inch Crushed Stone.
 2. Use to prevent soil intrusion into drains and/or to assist in stabilizing soil subgrades prior to placement of fill materials.
 3. Subsurface woven separation geotextile as separation material between crushed stone and gravel borrow base materials below cement concrete and hot-mix asphalt pavement as shown on the Contract Drawings.
 4. Where indicated or shown in the Contract Drawings.
- H. Controlled Density Fill (CDF):
1. CDF shall be used as shown on the Contract Drawings.
 2. CDF shall be used, if directed by the DESIGNER as fill at the limits of the excavation areas.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. The Contract Drawings indicate the proposed finish alignment, elevation, and grade of the work. Establish the line and grade in close conformity with the Contract Drawings.
- B. The Contractor is responsible for establishing construction phasing, means, and methods and interim grading and temporary conditions required to attain the finish product required by the Contract Documents. The Contractor is responsible for all construction, protection, movement, and maintenance of stockpiles. Establish and maintain suitable benchmarks and grade control to accurately perform the work.
- C. No excavation shall be deposited or stockpiled at any time to endanger portions of new or existing structures, either by direct pressure or indirectly by overloading banks contiguous to the operation. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.
- D. When the plans require excavation in areas in close proximity to existing buildings, roads, structures and utilities it shall be the responsibility of the Contractor at his expense to use satisfactory means and methods to protect and maintain the stability of such roads, and structures located immediately adjacent to but outside the limits of excavations.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 311000 - SITE CLEARING.
- C. Protect and maintain erosion and sedimentation controls, which are specified in Section 312500 – EROSION AND SEDIMENTATION CONTROLS, during earthwork operations.
- D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.3 DEWATERING

- A. Provide Dewatering as required to maintain dry excavations.
- B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.
 - 3. Where soil has been softened or eroded by flooding, equipment, traffic or placement of fill or concrete during unfavorable weather or such other conditions, it shall be removed and replaced by the Contractor with suitable material and at the Contractor's expense. The necessity and extent of such removals shall be determined by the Geotechnical Engineer.
- D. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
- E. Monitor dewatering systems continuously.
- F. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
 - 1. Space well points or wells at intervals required to provide sufficient dewatering.
 - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- G. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- H. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing

strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- I. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
 1. Maintain piezometric water level a minimum of 24 inches below surface of excavation.
- J. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- K. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to the Owner.
 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.
- L. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.4 EXCAVATION SUPPORT AND PROTECTION

- A. Work shall not be started until all materials and equipment necessary for the construction are either on the site of the work or satisfactorily available for immediate use as required.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 1. Shore, support, and protect utilities encountered.
- C. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner's Representative and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- D. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces or installation of improvements is not impeded.
- E. The excavation support and protection systems shall be securely and satisfactorily braced to withstand all pressures to which it may be subjected and be sufficiently tight to minimize lowering of the groundwater level outside the excavation.
- F. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- G. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.
- H. Responsibility for the satisfactory construction and maintenance of the excavation support system, complete in place, shall rest with the Contractor. Any work done, including incidental construction, which is not acceptable for the intended purpose shall be either repaired or removed and reconstructed by the Contractor at his expense.
- I. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
 2. Fill voids immediately with approved backfill compacted to density specified herein.
 3. Repair or replace, as approved by Owner's Representative, adjacent work damaged or displaced by the installation, performance, and removal of the excavation support and protection systems.

3.5 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms.
 - b. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - c. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.
- B. Provide sheeting, shoring and bracing to complete and protect all excavated areas, are required for safety and compliance with OSHA. Cost for sheeting, shoring and bracing shall be included as a part of the contract price for completing the work and Owner shall make no separate payment for this work.
- C. Perform excavation work in accordance with all applicable Federal, State, and Local regulations regarding safe excavation work.
- D. Excavation in the area of existing utilities. Expose utilities by hand or other excavation methods that will prevent damage. Required excavation near electric, gas, water lines, and fiber-optic telecommunication lines shall be hand dug within 3 feet of the lines.
- E. Do not excavate to full depths when freezing temperatures may be expected unless subgrades are protected from freezing.

3.6 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavation for Underground Tanks, Manholes, Basins, Mechanical and/or Electrical Utility Structures, Drainage and Sewer Systems, Infiltration Systems, and Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

3.7 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.8 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: 12 inches each side of pipe or conduit.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.9 SUBGRADE INSPECTION

- A. Notify the Owner's Representative when excavations have reached required subgrade.
- B. If the Owner's Representative, Geotechnical Engineer and/or the Designer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll granular subgrade below structures and pavements with heavy vibrating drum roller to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
 - 2. Proof-roll with approved equipment weighing not less than 15 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Designer, and replace with compacted backfill or fill as directed.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Geotechnical Engineer and/or the Designer, without additional compensation.
 - E. Protect all subgrades from disturbance.
 1. Place Gravel Borrow or Crushed Stone wrapped in non-woven geotextile over clayey, silty or wet footing subgrades. Fill shall not be placed in standing water.
 2. Grade around prepared subgrade areas to direct stormwater runoff away from the work area.
 3. Protect subgrades from frost at all times during construction. Fill should not be placed over frozen soil.

3.10 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavations under site improvement construction or utility pipe as directed by Designer. Lean concrete fill, with 28-day compressive strength of 2500 psi may be used when approved by Designer.

3.11 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials (from off-site sources) and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
 2. Stockpile soil materials in a location, acceptable to the Owner's Representative, that will preclude having to relocate stockpiled soil materials that would otherwise delay or impact the Work.

3.12 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing concrete formwork.
 5. Removing trash and debris.
 6. Removing temporary shoring and bracing, and sheeting.

7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on previously placed and compacted fill and/or subgrades free of mud, frost, snow, or ice.
- C. Excavated on-site natural soils may be used as Ordinary Fill, provided the material can be placed and compacted as required herein and at the approval of the Designer.
- D. The Contractor shall not commence backfilling operations without approval of the Owner's Representative and/or the Designer.
- E. The Contractor shall maintain a dry and firm subgrade throughout construction. Dewatering shall be performed as needed at the Contractor's expense.
- F. The Contractor shall strip the existing subgrade of any vegetation, topsoil, organics, debris, or other unsuitable materials. The subgrade shall be proof compacted using a vibratory roller to treat any loose or disturbed areas, and to provide a dense uniform surface.
- G. After the subgrade has been prepared, fill material shall be placed and built-up in successive layers until the required elevations are reached. No fill shall be placed on a frozen surface, nor shall snow, ice, or other frozen materials be included in fill. Wet materials containing moisture in excess of the amount necessary for satisfactory placement or compaction shall not be used.
- H. All fill shall be brought up in essentially level lifts and shall be placed in levels by standard methods. Layers of fill outside of utility trenches shall not exceed nine (9) inches in uncompacted thickness before compaction, unless otherwise specified, or as required for proper subgrade stabilization.
- I. Filling operations shall continue until the fill has been brought up to the finished slopes, lines, and grades making proper allowances for thickness of the overlying topsoil.
- J. The entire surface of the work shall be maintained free from ruts and in the condition that will permit construction equipment to travel over any section readily. The top surface of each layer shall be made level or slightly sloped toward the center of the filled area.
- K. Backfilling shall not be performed when weather conditions or the conditions of the materials are such that, in the opinion of the Geotechnical Engineer or the Designer, work cannot be performed satisfactorily.

3.13 BACKFILLING AGAINST STRUCTURES

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Backfilling against masonry or concrete shall not be done until permitted by the Owner's Representative. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking or other damage.
- C. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed and approved, special leakage tests of the structures shall be made by the Contractor, as required by the Owner's Representative. After the satisfactory completion of leakage tests and the satisfactory completion of any other required work in connection with the structures, the backfilling around the structures shall proceed using suitable and approved excavation material.
- D. The best of the backfill material shall be used for backfilling within 2-feet of the structure. Just prior to placing backfill, the areas shall be cleaned of all excess construction material and debris and the bottom of excavations shall be in a thoroughly compacted condition.
- E. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures. During backfilling operations, care shall be exercised that the equipment used will not overload the structures in passing over and compacting these fills. Except as otherwise specified or directed, backfill shall be placed in layers not more than 12 inches in loose depth and each layer of backfill shall be compacted thoroughly and evenly using approved types of mechanical equipment. Each pass of the equipment shall cover the entire area of each layer of backfill.
- F. In compacting and other operations, the Contractor shall conduct his operations in a manner to prevent damage to structures due to passage of heavy equipment over, or adjacent to, structures, and any damage thereto shall be made good by the Contractor at no additional expense to the Owner.

3.14 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

- C. Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 - CAST-IN-PLACE CONCRETE.
- D. Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.
- E. Place and compact initial backfill of subbase material free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- F. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- G. Backfill material shall be placed in maximum 6 inch lifts and mechanically compacted as specified herein.
- H. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- I. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- J. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened, to the depth required for proper compaction, then re-filled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
- K. During filling and backfilling operations, pipelines will be checked by the Owner's Representative to determine whether any displacement of the pipe has occurred. If the observation of the pipelines shows poor alignment, displaced pipe or any other defects they shall be remedied in a manner satisfactory to the Owner's Representative at no additional cost to the Owner.

3.15 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
- C. Place soil fills on subgrades free of mud, frost, snow, or ice.

3.16 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.
 - 3. Fill material shall not be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

3.17 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

Area	ASTM Density Degree of Compaction
Pavement and walkway base course	95%
Pavement and walkway subgrade	95%
General fill below pavement and walkway subbase	95%

Area	ASTM Density Degree of Compaction
Trench backfill - below pavements - below landscaped areas - below structures	95% 92% 95%
All other areas	90%

1. Under structures and pavement, proof-compact existing subgrade. Compact each layer of backfill soil material at 95 percent of the soils' maximum dry density (per ASTM D 1557). Fill areas within the 1H:1V influence zone of foundations and retaining wall footings shall also be compacted to 95 percent of the soils' maximum dry density (per ASTM D 1557).
 2. Under walkways, scarify and re-compact top 6 inches below subgrade to 95 percent of the soils' maximum dry density (per ASTM D 1557). Fill and base course material within 2 feet of the finished asphalt or concrete pavement grade shall be compacted to 95 percent of the soils' maximum dry density (per ASTM D 1557).
 3. For utility trenches in paved areas, compact each layer of initial and final backfill soil material to at least 95 percent of the soils' maximum dry density (per ASTM D 1557).
 4. For utility trenches in lawn or unpaved areas, compact each layer of backfill soil material to at least 92 percent of the soils' maximum dry density (per ASTM D 1557).
 5. Under lawn or unpaved areas, scarify and re-compact top 6 inches below subgrade and compact each layer of backfill or fill soil material to at least 90 percent of the soils' maximum dry density (per ASTM D 1557).
- D. In confined areas, place Crushed Stone in maximum 6-inch lifts and compact each lift with at least 4 passes of a vibratory plate compactor to a firm and unyielding surface. In open areas, place Crushed Stone in maximum 12-inch lifts and compact each lift with at least four passes of a vibratory drum roller with a minimum static weight of 10,000 pounds. Crushed stone fill shall be wrapped on all sides with non-woven filter fabric.

3.18 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Lawn or Unpaved Areas: Plus or minus 1 inch.
 2. Walks: Plus or minus 1 inch.
 3. Pavements: Plus or minus 1/2 inch.

3.19 SUBSURFACE DRAINAGE

- A. Subdrainage Pipe: Specified in Division 2 Section "Subdrainage."
- B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 1557.
- C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with 1 layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 1557.
 2. Place and compact impervious fill over drainage backfill in 6-inch-thick compacted layers to final subgrade.

3.20 SUBBASE AND BASE COURSES

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
1. Install separation geotextile fabric on prepared subgrade, where indicated on the Contract Drawings, according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material over subbase course under hot-mix asphalt pavement.

3. Shape subbase and base course to required crown elevations and cross-slope grades.
 4. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
 5. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.
- C. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.21 DRAINAGE COURSE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under pavements, walkways and cast-in-place concrete slabs-on-grade as follows:
 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.22 FIELD QUALITY CONTROL

- A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by the Owner for field quality control activities for the Work of this Section. Refer also to Section 014325 - TESTING AGENCY SERVICES.
- B. Cooperate with field quality control personnel.
- C. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.
- D. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
 2. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained. Costs related to retesting due to unacceptable quality of work and failures discovered by the testing shall be borne by the Contractor.
- G. Notify the Independent Testing Agency a minimum of 72 hours prior to start of earthwork operations, to comply with Code requirement that a registered design professional be present at all times during backfill to assure adequate compaction with no bridging effects. The services of the Testing Agency, Geotechnical Engineer and the Designer shall include, but not be limited to, the following:
1. Observation during excavation, backfilling, and compaction.
 2. Laboratory testing and analysis of fill materials specified or proposed for use as required.
 3. Observation of construction and performance of water content, gradation, and compactions tests at a frequency and at locations that he/she shall select. The results of these test will be submitted to the Owner's Representative so that the Contractor can take such action as is required to remedy any indicated deficiencies.
 4. Observation of proof-compaction of exposed subgrades. Proof-compaction may be waived if, in the opinion of the Geotechnical Engineer, disturbance will occur and cause loss of strength of underlying soil.
- H. The Contractor shall make provisions for allowing observations and testing of Contractor's Work by the Testing Agency and the Geotechnical Engineer, and the Designer. The presence of the Testing Agency, Geotechnical Engineering, and/or the Designer does not include supervision or direction of the actual work by the Contractor, his/her employees, or agents. Neither the presence of the Testing Agency, Geotechnical Engineer, and/or the Designer nor any observations and testing performed by those entities or any notice or

failure to give notice, shall excuse the Contractor from defect discovered in his/her work.

3.23 PROTECTION

- A. No excavation will be permitted below a line drawn downwards at 2 horizontal to 1 vertical from the underside of the closest edge of any proposed in-place footing or utility at a higher elevation without providing adequate sheeting and bracing or underpinning to prevent loss of support of the footing or utility.
- B. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- C. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Designer; reshape and recompact.
- D. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.24 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Contractor shall remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

DIVISION 31 **SUBSURFACE INVESTIGATION & DEMOLITION**

SECTION 31 23 00 **EXCAVATION AND BACKFILL**

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that all the material, labor, and equipment be furnished complete in every respect, and that this Contractor shall provide all material, labor, and equipment needed and usually furnished in connection with such systems to provide a complete installation including all demolition, disposal, and patching of adjacent surfaces. Materials, equipment, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the Excavation and Backfill work required to complete the work of the contract including all the Excavation and Backfill work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the Excavation and Backfill work with all the other trades for the project. Provide all demolition and disposal work to complete the Excavation and Backfill work. Patch to match all adjacent surfaces that are disturbed left exposed, or unfinished. All work of the contract is related. It is the General Contractor's responsibility to review all the work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the work can be properly and completely performed.
- B. Excavation and Backfill work includes, but is not limited to:
 - 1. Protection of all roads, sidewalks and existing utilities to remain. It is the Contractor's responsibility to call Dig Safe in the area of excavation.

2. Legal disposal off-site of all unsuitable excavated materials and on-site stockpiling of all suitable excavated material.
 3. Supply and placement of all backfill materials required to complete the Work of this Section, including backfilling to indicate finished grade elevation.
 4. Protection of trees and plantings to remain.
 5. Filling, compaction, and rough grading of site. Install a 6" thick gravel base course over entire site to make site suitable for future paving by the Town.
 6. Water and erosion control of excavations.
 7. Shoring and bracing of excavation.
- C. Alternate #1:
1. Protection of all roads, sidewalks and existing utilities to remain. It is the Contractor's responsibility to call Dig Safe in the area of excavation.
 2. Legal disposal off-site of all unsuitable excavated materials and on-site stockpiling of all suitable excavated material.
 3. Supply and placement of all backfill materials required to complete the Work of this Section, including backfilling to indicate finished grade elevation.
 4. Protection of trees and plantings to remain.
 5. Filling, compaction, and rough grading of site. Install a 6" thick gravel base course over entire site to make site suitable for future paving by the Town.
 6. Water and erosion control of excavations.
 7. Shoring and bracing of excavation.
- D. Provide all excavation and backfill to perform the work of the contract whether or not indicated including but not limited to the following locations:
1. Excavation, removal, and disposal of construction debris and unsuitable material from entire footprint of building to be demolished. Backfill excavation of entire building footprint to match grade of adjacent lot (Veterans Memorial Park).

1.03 STANDARDS AND CODES

- A. The work shall conform to the codes and standards of the following agencies as further cited herein:
 - 1. ASTM: Specifications of the American Society for Testing and Materials.
 - 2. AASHTO: American Association of State Highway and Transportation Officials.
 - 3. ACI: American Concrete Institute
 - 4. Code: Massachusetts State Building Code.

1.04 QUALITY ASSURANCE

- A. Comply with all rules, regulations, laws and ordinances of the Commonwealth of Massachusetts, and of all other authorities having jurisdiction. All labor, materials, equipment, and services necessary to make work comply with such requirements shall be provided without additional cost to Awarding Authority.
- B. Field Monitoring and Testing
 - 1. Do not place any fill until the Awarding Authority's representative has observed the excavation
 - 2. All new fill material brought on-site shall be subject to approval of the Awarding Authority prior to placement of such material. The contractor shall provide a submittal to the Awarding Authority that specifies the name, location, and type of material to be obtained from the proposed fill source. Appropriate testing of the fill material shall be required by the Awarding Authority to ensure that no hazardous constituents are present in new fill material. Testing parameters shall include PCB's, VOC's, SVOC's, and Metals. The Contractor shall be responsible for all costs associated with testing of proposed fill material and results shall be provided to the Awarding Authority for review and approval.
 - 3. Approvals given by the Architect or by the testing agencies shall not relieve the Contractor of his/her responsibility for performing the work in accordance with the Contract Documents.

1.05 SUBMITTALS

- A. The Contractor shall submit the information specified herein to the Architect for review. Unless otherwise specified, submittals shall be made not less than one week before the start of work.

- B. Personnel qualifications, including name, license identification, qualification, and other identification of person(s) responsible for field survey.

1.06 JOB CONDITIONS

- A. The Contractor shall be responsible for verifying existing grades and layouts. Site conditions and information must be field verified before proceeding with Work. The Architect reserves the right to require adjustments to accommodate field-verified conditions at no additional cost to the Awarding Authority.
- B. Work shall not interfere with normal use of public ways, including streets and sidewalks, unless permission is obtained from the Awarding Authority and local authorities.
- C. The Contractor shall protect adjacent property and public utilities from damage associated with the excavation and backfilling operation. Damage due to the work shall be repaired by the Contractor at his own expense.

1.07 LINES AND GRADES

- A. Lay out all lines and grade work in accordance with Drawings and Specifications not presently established at the site. Maintain all established bounds and benchmarks and replace any which are destroyed or disturbed.
- B. The words "finished grades" as used herein shall mean the required final grade elevations indicated on the Drawings. Where not otherwise indicated, project site areas shall be given uniform slopes between points of existing established grades.

PART 2 – PRODUCTS

2.01 MATERIALS

Earth materials used as fill shall be as designated below:

- A. Common Fill: Common Fill shall consist of well graded mineral soil substantially free of organic materials, loam, wood, trash, and other objectionable material which may be compressible or which cannot be compacted properly. Common Fill shall be unfrozen and shall not contain snow, ice, or frozen materials. Common Fill shall not contain stones larger than six (6) inches in largest dimension and shall have physical properties such that it can be readily spread and compacted. Common Fill shall conform to Massachusetts DPW specification for Ordinary Borrow, M1.01.0.
- B. Gravel Base: Gravel base shall be sandy gravel or gravelly sand, free of organic material, loam, snow, ice, frozen soil, and other objectionable materials and well graded within the following limits:

EXCAVATION AND BACKFILL

U.S. Standard

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
3"	100
#4	40-75
#40	8-28
#200	0-8

PART 3 – EXECUTION

3.01 PROTECTION

- A. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protecting during excavation operations.
- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the utility Awarding Authority immediately for directions. Cooperate with Awarding Authority and public and private service companies in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility Awarding Authority.
- C. Protect adjacent areas from soil and damage.

3.02 EXCAVATION

- A. General
 - 1. Excavation consists of the removal and disposal or stockpiling of soil materials encountered during the removal of the below grade materials to be demolished and removed from site.
 - 2. All material encountered during excavation shall be classified as general excavation. No additional payment shall be made for removal of materials encountered in the excavation including concrete slabs, foundation walls etc. The excavation operations shall be conducted in a manner to insure the most efficient reuse of excavated materials where suitable. Suitable materials shall be used or stockpiled for later use in backfill preparation.

EXCAVATION AND BACKFILL

3. All surplus excavated material not used to fulfill requirements of the Contract shall become the property of the Contractor and shall be removed from the site and legally disposed of.
4. When excavations have reached the prescribed depths, the Architect shall be notified to observe the conditions. Contractor will receive notification to proceed if bearing conditions meet the design requirements.
5. If any underground fuel tanks are encountered, the Contractor will be responsible for removal of such tanks encountered and their contents. Any tanks encountered must be reported to the Awarding Authority.

B. Earth Excavation

1. Excavate earth utilizing appropriate equipment in sufficient quantity and sizes to expeditiously perform the excavation required to the lines and grades specified and/or indicated on the Drawings.
2. Prevent disturbance to soil subgrades below foundations of adjacent building to remain.
3. Sloped sides of excavations must be stable slopes that comply with codes and ordinances having jurisdiction.

3.03 TEMPORARY EXCAVATION SUPPORT

- A. It is the responsibility of the Contractor to provide protection to provide safe and stable excavations at all times during construction.

3.04 DEWATERING

- A. Dewater as necessary to maintain dry excavations. Provide temporary water control ditches, pumps, and piping as needed to control water.

3.05 PLACEMENT AND COMPACTION OF MATERIALS

A. General

1. All fill materials shall be placed "in-the-dry" on subgrades acceptable to the Architect. The Contractor shall dewater excavated areas as required to perform the work, and in such a manner as to preserve the undisturbed state of the subgrade material. The Contractor shall drain away ponded areas as required to perform the placement of fill "in-the-dry".
2. During compaction operations incidental compaction due to traffic by construction equipment, other than used specifically in compaction

operations, will not be credited toward the required minimum coverages specified.

3. Bulldozers, trucks, and other mechanical contrivances used in placement of fill materials are expressly prohibited from approaching within 8 feet of backfilled building walls.
 4. Placement of all specified fill materials shall be in horizontal loose layers not exceeding 12" and compact after each layer. Fill areas for site development as required to raise grade to required finished grade elevations
 5. Compaction of fill materials shall be conducted by a minimum of four (4) complete coverages with acceptable compaction equipment to a specified density which is expressed as a percentage of maximum dry density as determined by ASTM D1557.
- B. Backfill excavations as promptly as Work permits, but not until completion of the following:
1. Removal of temporary earth support elements.
 2. Removal of trash and debris.
- C. Compaction Equipment
1. In all cases, the character, efficiency and acceptability of the Contractor's compaction equipment shall be subject to the approval of the Architect based on observed or documented field performance.
 2. Compaction in open areas shall be conducted with heavy equipment, such as vibratory rollers, conforming to the compaction characteristics of a RayGo 400, or by other acceptable equipment.
 3. Compaction in confined areas (against walls) shall be conducted with acceptable equipment, such as hand-guided vibratory compactors or mechanical tampers.
 4. Exercise care in the placement of backfill against wall and directly in contact with waterproofed structures such that stones contained in the backfill do not damage waterproofing.
 5. Repair any damage to waterproofing which occurs during placement and compaction operations at no additional cost to Awarding Authority.

6. Control groundwater by ditches, sumps, or sloped surfaces to permit collection and removal efficiently and with minimal disturbance to materials being placed.
7. Fill materials of the various types specified shall generally be placed and compacted within the limits and to the thickness indicated on the Drawings unless otherwise specified.
8. Do not place fill material on surfaces that are muddy, frozen, or contain frost or ice.
9. Place fill materials evenly adjacent to structures to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
10. Fill shall not be placed when the atmospheric temperature is less than 30 degrees, unless prior approval is given by the Architect.
11. Compaction by puddling or jetting is prohibited.

D. Moisture Control

1. The amount of moisture in any one layer of fill material shall be as uniform as practicable throughout. The upper limit of water content in materials shall be that which will permit handling, spreading and will permit proper compaction and shall not exceed a value of three (3) percentage points on the wet side of optimum water content as determined by ASTM D1557. The lower limit of water content shall not be less than two (2) percentage points below optimum water content. Material which is too wet, shall be spread and permitted to dry, assisted by mechanical agitation, if necessary, until the water content is reduced to a value within the specified limits.
2. Each layer of material which is too dry shall be sprinkled with water, and the water worked into the material by mechanical methods until a uniform distribution of moisture shall be accurately controlled in amount so that free water will not appear on the surface during, or subsequent to, compaction.

E. Common Fill

1. Place in layers not to exceed twelve inches.
2. Compact to at least 92 percent of maximum dry density.

F. Gravel Base Course

1. Place in layers not to exceed nine inches when utilizing heavy compaction equipment and in six inch layers when utilizing light, hand-operated compaction equipment.
2. Compact to at least 95 percent of maximum dry density.

3.07 GRADING

A. General

1. Perform all rough and finish grading to match the finished grade elevation at the site to the elevation of the adjacent site (Veterans Memorial Park).
2. Uniformly rough grade to prevent ponding of water and to slope away from existing structures.
3. Fill voids resulting from demolition of structure with appropriate fill material specified.

B. Treatment after Completion of Grading

1. After grading is completed and the Architect has finished inspection, permit no further excavating, filling, or grading except with the approval of and inspection by the Architect.
2. Use of all means necessary to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

END OF SECTION

DIVISION 02

EXISTING CONDITIONS

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1-GENERAL

1.01 GENERAL REQUIREMENTS

- A. Include the General Conditions, Modifications to the General Conditions, and applicable parts of Division 01 as part of this Section.
- B. Examine all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under Contract.
- D. It is the intent of the Specifications and the Drawings to require that the equipment to be furnished be complete in every respect, and that this Contractor shall provide all equipment needed and usually furnished in connection with such systems to provide a complete installation. Equipment, materials, and articles incorporated in the work shall be new and of the best grade of their respective kinds.

1.02 WORK TO BE PERFORMED

- A. Provide all the Erosion and Sedimentation Controls Work required to complete the Work of the Contract including all the Erosion and Sedimentation Controls Work shown on the plans, listed in the specification, and needed to install a complete assembly in every way. Coordinate the Erosion and Sedimentation Controls Work with all the other trades for the project. Provide all demolition and disposal Work to complete the Erosion and Sedimentation Controls Work. Patch to match all adjacent surfaces that are disturbed, left exposed, or unfinished. All Work of the Contract is related. It is the General Contractor's responsibility to review all the Work of each section, each Subcontractor, and each file sub-bidder for the entire project so that all the Work can be properly and completely performed.
- B. Erosion and Sedimentation Controls Work includes, but is not limited to:
 - 1. In general, the Contractor shall supply all material, equipment, temporary protection, tools and appliances necessary for the proper removal of selected construction materials for the completion of the Work as required in the Specifications, in accordance with good construction, and as required by the materials manufacturer.

- C. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Control measures to prevent all erosion, siltation and sedimentation of wetlands, waterways, construction areas, adjacent areas and off-site areas.
 2. Control measures shall be accomplished adjacent to or in the following work areas:
 - a. Soil stockpiles and on-site storage and staging areas.
 - b. Cut and fill slopes and other stripped and graded areas.
 - c. Constructed and existing swales and ditches.
 - d. Retention ponds.
 - e. At edge of wetlands areas, if applicable, as shown on Drawings.
 3. The Contract Drawings indicate the minimum requirements for sedimentation and erosion control. The Contractor shall install all measures needed to control sediment and erosion as required by the Contractor and Sub-contractor's construction methods and operations, the weather conditions, and as directed by the Engineer.
 4. Additional means of protection shall be provided by the Contractor as required for continued or unforeseen erosion problems, at no additional cost to the Owner.
 5. Periodic maintenance of all sediment control structures shall be provided to ensure intended purpose is accomplished. Sediment control measures shall be in working condition at the end of each day.
 6. After any significant rainfall, sediment control structures shall be inspected for integrity. Any damaged device shall be corrected immediately.
- B. Alternates: Add Alternate #1.
- C. Items To Be Installed Only: Not Applicable.
- D. Items To Be Furnished Only: Not Applicable.
- E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
1. Section 311000 – SITE CLEARING for protection of existing trees and other vegetation to remain.
 2. Section 312000 – EARTH MOVING for soil materials, excavating, backfilling, and site grading and removal of site utilities.

EROSION AND SEDIMENTATION CONTROLS

1.04 SUBMITTALS

- A. Refer to SECTION 013300 – SUBMITTALS for submittal provisions and procedures.
1. At least 20 days prior to the start of the project, the Contractor shall submit a Storm Water Pollution Prevention Plan (SWPPP) indicating project phasing, Contractor operation areas, work areas, stockpile locations, construction staging/sequencing, and sedimentation/erosion control measures to be used. The SWPPP shall be prepared to meet the requirements of the United States Environmental Protection's (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges From Construction Activities (GCP). The Contractor shall also submit the EPA "Notice of Intent for Storm Water Discharges Associated with CONSTRUCTION ACTIVITY Under a NPDES General Permit." (NOI) form. This form shall be submitted to the EPA at least 14 days prior to the start of any construction activity and placing a signed copy along with proof of mailing in the SWPPP.
 2. As part of the Contract Closeout procedures, the Contractor is responsible for filing a Notice of Termination with the EPA once the project has been completed and is permanently stabilized. Stabilization is complete when all temporary storm water and erosion controls have been removed, all permanent storm water and erosion controls are in place and functional and all vegetated areas are at least 70% viable.
 3. The Contractor shall provide the manufacturer's literature, material specification, and installation instructions for sedimentation and erosion control materials and devices for approval. Do not order materials until approval of certifications or test results has been obtained. Delivered materials shall match the approved submittals.
 4. LEED Supporting Documentation: Submit LEED supporting documentation as outlined in Section 018110 SUSTAINABLE DESIGN REQUIREMENTS for materials and products that have been extracted, harvested, or recovered, as well as manufactured within 500 miles of the project site.

1.04 QUALITY ASSURANCE

- A. When applicable, comply with the requirements of Stormwater Pollution Prevention Plan prepared for the NPDES permit, which are incorporated herein by reference, and all other applicable requirements of governing authorities having jurisdiction. The specifications and drawings are not represented as being comprehensive, but rather convey the intent to provide complete slope protection and erosion control for both the project site and adjacent property.
5. Provide temporary erosion and sedimentation control measures to prevent soil

EROSION AND SEDIMENTATION CONTROLS

erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to a sediment and erosion control plan specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

- B. Erosion control measures shall be established at the beginning of construction and maintained during the entire period of construction. On-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation, are to be identified and receive special attention.
- C. The Contractor shall install and maintain sedimentation control devices during construction to prevent the movement of sediment from the construction site to off site areas, into adjacent water bodies via surface runoff or into underground drainage systems. Measures to prevent the movement of sediment off site shall be installed, maintained, removed, and cleaned up at no additional cost to the Owner.
- D. All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time, and the length of time of exposure.
- E. Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.
- F. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving stream bed, provide measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream.
- G. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedimentation damage.
- H. The Contractor is responsible for cleaning out and disposing of all sediment once the storage capacity of the sediment facility is reduced by one-half.
- I. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- J. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.05 REFERENCE STANDARDS

- A. The following standards are applicable to the work of this Section to the extent referenced herein:
 - 1. "Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas, A Guide for Planners, Designers and Municipal Officials", prepared by the Massachusetts Department of Environmental Protection,

EROSION AND SEDIMENTATION CONTROLS

Bureau of Resource Protection, dated March 1997, reprinted May 2003.

1.06 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the site.
- K. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of the work involved.

1.07 PERMITS, CODES AND REGULATIONS

- A. Comply with all rules, regulations, laws and ordinances of the City and State, and all other authorities having jurisdiction over the project site. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Owner.
- L. Comply with all applicable regulations of the Commonwealth of Massachusetts Department of Environmental Protection (DEP) and the EPA.
- M. The Contractor shall comply with the requirements of the NPDES GCP for this project.

PART 2-PRODUCTS

2.01 MATERIALS

- A. Straw Bales: Wire or nylon bound bales of straw, oriented around sides, rather than over and under.
- B. Stakes: Stakes for bales shall be one of the following materials: Wood stakes of sound hardwood 2 by 2 inches in size or steel reinforcing bars of at least No. 4 size. Lengths shall be approximately three feet.
- C. Straw Wattles
 - 1. Straw wattles shall consist of weed free rice straw inside biodegradable netting. Straw wattles shall measure at least nine (9) inches in diameter.
 - 2. Stakes for wattles shall be one of the following materials. Lengths shall be approximately two feet (2').
 - a. Wood stakes of sound hardwood, one inch by one inch (1" x 1") in size.
 - b. Steel reinforcing bars of at least No. 4 size.

EROSION AND SEDIMENTATION CONTROLS

D. Siltation Fence

1. Fabricated or prefabricated unit consisting of the following filter fabric properties:

a. Grab Tensile Strength (lbs)	124	ASTM D4632
b. Elongation at Failure (%)	15	ASTM D4632
c. Mullen Burst Strength (PSI)	280-300	ASTM D3786
d. Puncture Strength (lbs)	60-65	ASTM D4833
e. Water Flow Rate (gal/min/sf)	8-10	ASTM D4491
f. Apparent Opening Size (Sieve)	30	ASTM D4751
g. Ultraviolet Radiation Stability (%)	70-80	ASTM D4355

2. Use only commercially available fabric that is certified in writing by the manufacturer for the purpose intended.

3. Acceptable fabric materials include "Mirafi Envirofence" by Mirafi Construction Products, "Style 2130" by Amoco Fabrics Co., and "IVI 3617C Silt Fence" by Indian Valley Industries, Inc., or approved equal by the Engineer.

4. Silt fence posts: Posts may be wood or metal. Wood post shall be a minimum 1¼ inch by 1¼ inch by 5 feet long hardwood stakes commonly used to support siltation fabric. Metal posts shall be a minimum of 1 inch wide and 5 feet long. Posts shall be spaced at a maximum distance of 8 feet on center.

5. Provide suitable heavy nylon cord for securing abutting silt fence posts.

- E. Fencing: Steel posts shall be standard 6 foot long metal stamped drive stakes commonly used to support snow fences. Fencing shall be new four foot height wood lath snow fencing. Provide suitable steel staples or heavy nylon cord for securing filter cloth to support system.

- F. Crushed Stone: Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious or organic material. The crushed stone shall be uniformly blended and shall conform to the following requirements.

Percent Passing by Weight		
Sieve Size	1 1/2-inch Stone	3/4-inch Stone

Percent Passing by Weight		
Sieve Size	1 1/2-inch Stone	3/4-inch Stone
2-inch	100	---
1 1/2-inch	95-100	---
1 1/4-inch	---	---
1-inch	35-70	100
3/4-inch	0-25	90-100
1/2-inch	---	10-50
3/8-inch	---	0-20
No. 4	---	0-5

- G. Protective Measures: As temporary coverings on ground areas subject to erosion, provide one of the following protective measures, and as directed by the Designer with concurrence of the Owner's Representative:
1. Hay or straw temporary mulch, 100 pounds per 1,000 square feet.
 2. Wood fiber cellulose temporary mulch, 35 pounds per 1,000 square feet.
 3. Tackafier for anchoring mulch or straw shall be a non-petroleum based liquid bonding agent specifically made for anchoring hay or straw.
 4. Provide natural (jute, wood excelsior) or man-made (glass fiber) covering with suitable staples or anchors to secure to ground surface. Note that wire staples and non-biodegradable coverings shall not be used for any area that will be mown turf.
 5. Temporary vegetative cover for graded areas shall be undamaged, air dry threshed straw or hay free of undesirable weed seed.
- H. Temporary Covers For Drainage Structures
1. Filter fabric for use as temporary covers for drainage structures shall be the same as noted above for siltation fence.
 2. Wire mesh for use at temporary drainage structure covers shall be 6" x 6", W2.9 welded wire mesh.
 3. Crushed stone shall be as specified herein before.
 4. Silt-Sac, Hydro-FloGard + Plus Catch basin Insert, Ultra-DrainGuard Insert, or approved equal, may be used in lieu of hay bales and filter fabric at catch basins.

EROSION AND SEDIMENTATION CONTROLS

PART 3-EXECUTION

3.01 GENERAL REQUIREMENTS

- A. The Contractor shall provide suitable and adequate means of sedimentation and erosion control during construction. Control measures shall prevent all erosion, siltation and sedimentation of waterways, drainage systems, construction areas, adjacent areas and off-site areas. Work shall be accomplished on and/or adjacent to the following work areas:
1. Earthwork stockpiles and on-site storage and staging areas.
 2. Cut and fill slopes and other stripped and exposed graded areas.
 3. Constructed and existing swales and ditches.
 4. Unestablished lawns and seeded embankments.
- B. Means of protection as noted on the Contract Drawings indicate the minimum provisions necessary. Additional means of protection shall be provided by the Contractor as required for continued or unforeseen erosion problems, at no additional expense to the Owner.
- C. Periodic maintenance of all sediment control installations shall be provided to ensure intended purposes are accomplished. Sediment control measures shall be in working condition at the end of each day.
- D. After any significant rainfall, sediment control devices shall be inspected for integrity. Any damaged device shall be corrected immediately.
- E. The Contractor shall provide adequate means of control of runoff, as to not detrimentally impact downstream conditions during construction. The Contractor shall plan his operations so that permanent drainage mitigation systems such as detention/retention/infiltration basins and chambers are in place and properly functioning prior to connecting upland drainage flows to these systems. The Contractor shall plan his operations such that downstream drainage mitigation measures are in place and functioning before attempting to tie in upgradient drainage systems.
- F. In the event that the Contractor is unable to sequence the work so that construction of the permanent drainage mitigation systems precedes the upland work, then the Contractor shall submit a plan indicating his proposed methods of otherwise controlling runoff from the site.
- G. The "Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas" should be consulted as a guide for the selection and installation of Best Management Practices to suit the conditions encountered.

3.02 STRAW BALE BARRIERS

- A. Excavation shall be to the width of the bale and the length of the proposed barrier to a minimum depth of 4 inches.
- B. Bales shall be placed in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another. In swales and ditches the barrier shall extend to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale.
- C. Staking shall be accomplished to securely anchor bales by driving at least two stakes or rebars through each bale to a minimum depth of 18 inches.
- D. The gaps between bales shall be filled by wedging straw in the gaps to prevent water from escaping between the bales.
- E. The excavated soil shall be backfilled against the barrier. Backfill shall conform to ground level on the downhill side and shall be built up to 4 inches on the uphill side. Loose straw shall then be scattered over the area immediately uphill from a straw barrier.
- F. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
- G. Bales shall be removed when they have served their usefulness so as not to block or impede stormwater flows or drainage.

3.03 STRAW WATTLE BARRIERS

- A. Install straw wattles in locations as shown on Contract Drawings and as directed.
 - 1. Wattles shall be placed in a row with ends overlapping a minimum of two (2) feet.
 - 2. Each wattle shall be embedded in the soil a minimum of two (2) and a maximum of six (6) inches.
 - 3. Wattles shall be securely anchored in place by stakes or rebars driven through the wattles and a minimum twelve (12) inches into the soil. Stakes shall be placed four (4) feet on center.
- B. Inspection shall be frequent and repair or replacement shall be made as needed.
- C. Wattles shall be removed when they have served their usefulness so as not to block or impede stormwater flows or drainage.

3.04 STABILIZED CONSTRUCTION ENTRANCE AND STONE BERMS

- A. Stone size: Use ASTM designation C-33, size No. 2 (1-1/2" to 2-1/2"). Use

crushed stone.

- B. Length: As effective, but not less than 50 feet.
- C. Thickness: Not less than eight inches.
- D. Width: Not less than full width of all points on ingress or egress, but not less than 25 feet.
- E. Washing: When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch, or watercourse through the use of sand bags, gravel boards or other approved methods.
- F. Maintenance: The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-or-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spoiled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- G. Place crushed stone berms in locations required and as directed. Berms shall have side slopes of 1:3 or less.
- H. Inspect stone berms periodically and replace and/or regrade crushed stone as required.

3.05 SILT FENCING

- A. Excavate a 6 inch trench along the upstream side of the desired fence location.
- B. Drive fence posts a minimum of 1'-6" into the ground. Install fence, well-staked at maximum eight foot intervals in locations as shown on Drawings. Secure fabric to fence and bury fabric end within the six inch deep trench cut.
- C. Lay lower 12 inches of silt fence into the trench, 6 inches deep and 6 inches wide. Backfill trench and compact.
- D. Overlap joints in fabric at post to prevent leakage of silt at seam.
- E. Inspect siltation fence after major storm events and periodically and remove accumulated sediment and debris. If a breach or failure of the siltation fence occurs, the fence shall immediately be restored.

3.06 EROSION CONTROL GRASSING

- A. Grassing shall be applied according to State of Massachusetts Highway Department Standard Specifications.

EROSION AND SEDIMENTATION CONTROLS

3.07 INLET PROTECTION

- A. Install silt fence or straw bales around inlet as specified herein.
- B. Install temporary covers at drainage structure locations that may be subject to erosion infiltration and as directed by the Engineer.
- C. Inspect drainage structures periodically. Remove sediment accumulation and regrade or replace materials as required.

3.08 DUST CONTROL

- A. Throughout the construction period the Contractor shall carry on an active program for the control of fugitive dust within all site construction zones, or areas disturbed as a result of construction. Control methods shall include the following: Apply calcium chloride at a uniform rate of one and one-half (1 ½) pounds per square yard in areas subject to blowing. For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.
- B. The frequency and methods of application for fugitive dust control shall be as directed by the Designer with concurrence by the Owner's Representative.

3.09 TEMPORARY PROTECTIVE COVERINGS

- A. Place temporary soil coverings to control erosion and sedimentation on all disturbed or graded areas as required by the construction methods employed and as directed by the Engineer. Erosion control matting shall be installed in all areas seeded or hydroseeded with slopes of one vertical foot to three foot horizontal, or steeper, immediately after such areas have been seeded and a hay mulch applied as follows:
 - 1. The area to receive matting shall have been recently seeded and shall have a smooth surface free front stones, clods or depressions.
 - 2. Roll out of the matting perpendicular to the slope, do not stretch the fabric. In drainage swales, center the fabric along the flow line. Install the matting in a check slot at the top and bottom of the slope and at the edges of the area to be covered. Check slots shall be six inches deep and six inches wide. Fabric shall extend down one wall of the check slot and across the full width of the base. Overlap edges of matting rolls four (4) inches minimum and overlap the ends eighteen (18) inches minimum.
 - 3. Install staples in check slots, edges, center and ends of rolls by driving specified steel staples two feet on center over the entire area to be covered except at check slots and ends of rolls, where staples shall be placed six inches on center. All staples shall be driven below finished grade.
 - 4. Fill check slots with loam and tamp firmly.

5. Reseed check slots and all disturbed areas per Specifications.
 6. Following matting installation, roll the entire area with a smooth drum roller weighing between fifty and seventy-five (50-75) pounds per linear foot of roller. The finished installation of matting shall be firmly in contact with the seeded area and provide a smooth, finished appearance free from lumps or depressions.
- C. Install erosion control matting as a temporary ground cover in all disturbed or graded areas subject to erosion and as directed by the Engineer. The temporary ground cover shall protect the site from erosion until a full permanent lawn can be installed. Install and anchor in place temporary erosion control matting in accordance with manufacturer's printed instructions or as directed by the Engineer and remove all temporary erosion control matting prior to installation of a permanent lawn.
- D. Inspect protective coverings periodically and reset or replace materials as required.
- 1.04 TEMPORARY PROTECTIVE COVERINGS (AFTER GROWING SEASON)
- A. Place temporary covering for erosion and sedimentation control on all areas that have been graded and left exposed after October 30. Contractor shall have the choice to use either or both of the methods described herein.
 - B. Hay or straw shall be anchored in-place by one of the following methods and as approved by the Designer with concurrence by the Owner's Representative: Mechanical "crimping" with a tractor drawn device specifically devised to cut mulch into top two inches of soil surface or application of non-petroleum based liquid tackifier, applied at a rate and in accordance with manufacturer's instructions for specific mulch material utilized.
 - C. Placement of mesh or blanket matting and anchoring in place shall be in accordance with manufacturer's printed instructions.
 - D. Inspect protective coverings periodically and reset or replace materials as required.
- 3.11 REMOVAL AND FINAL CLEANUP
- A. Once the site has been fully stabilized against erosion, and with the approval of the Owner's Representative remove sediment control devices and all accumulated silt. Dispose of silt and waste materials offsite. Regrade all areas disturbed during this process and stabilize against erosion with surfacing materials as indicated.

END OF SECTION