

EXPANSION & RENOVATE AS NEW – PHASE 1

**CRYSTAL LAKE ELEMENTARY SCHOOL
284 SANDY BEACH ROAD
ELLINGTON, CT 06029
STATE PROJECT NO. 048-0058 EA/RR/PS**

S/P+A PROJECT NO. 12.140

DATE: December 5, 2013

The following changes to the Drawings and Project Specifications shall become a part of the Drawings and Project Specifications; superseding previously issued Drawings and Project Specifications to the extent modified by Addendum No. 1.

New Specifications:

- SECTION 011000, SUMMARY OF WORK has been added and is attached as part of this addendum. (4)
- SECTION 071326, SELF-ADHERING SHEET WATERPROOFING has been added and is attached as part of this addendum. (5)
- SECTION 071900, UNDER SLAB VAPOR BARRIERS has been added and is attached as part of this addendum. (3)
- SECTION 074113.16, STANDING-SEAM METAL ROOF PANELS has been added and is attached as part of this addendum. (9)
- SECTION 074213.19, INSULATED METAL WALL PANELS has been added and is attached as part of this addendum. (18)

Changes to the Specifications:

- TABLE OF CONTENTS:
 - Page 1, Division 1 – General Requirements:
 - Section 014127, Stormwater General Permit, Pages, revise “60” to read “62”.
 - Add the following:

“Section 011000	Summary of Work	3”
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 - Page 3:
 - Division 7 – Thermal and Moisture Protection, add the following:

“Section 071326	Self-Adhering Sheet Waterproofing	5
Section 071900	Under Slab Vapor Barriers	3

Section 074113.16 Standing-Seam Metal Roof Panels	9
Section 074213.19 Insulated Metal Wall Panels	18”

- Division 8 – Openings:
 - * Section 081113, Hollow Metal Doors and Frames, Pages, revise “13” to read “11”.
 - * Section 081416, Flush Wood Doors, Pages, revise “9” to read “6”.
 - * Section 083313, Coiling Counter Doors, Pages, revise “16” to read “5”.
- DRAWING LIST, Page 1, Information and Code Drawings, revise “A004 PHASING PLAN” to read as follows:
 - “A004.1 PHASING PLAN BUILDING CONSTRUCTION PHASE 1
 - A004.2 PHASING PLAN BUILDING CONSTRUCTION PHASE 2
 - A004.3 PHASING PLAN BUILDING CONSTRUCTION PHASE 3”
- SECTION 014127, STORMWATER GENERAL PERMIT, delete in its entirety. A new SECTION 014127, STORMWATER GENERAL PERMIT has been added and is attached as part of this addendum. (62)
- SECTION 081113, HOLLOW METAL DOORS AND FRAMES, delete in its entirety. A new SECTION 081113, HOLLOW METAL DOORS AND FRAMES has been added and is attached as part of this addendum. (11)
- SECTION 081416, FLUSH WOOD DOORS, delete in its entirety. A new SECTION 081416, FLUSH WOOD DOORS has been added and is attached as part of this addendum. (6)
- SECTION 083313, COILING COUNTER DOORS, delete in its entirety. A new SECTION 083313, COILING COUNTER DOORS has been added and is attached as part of this addendum. (5)
- SECTION 087100, DOOR HARDWARE, Page 19, Article 3.6, HW-24, delete “butts” in its entirety and revise “acoustical seals” to read “remaining hardware by door manufacturer”.
- SECTION 089000, LOUVERS AND VENTS, Page 1, Article 1.1.B., revise “019113” and “General” to read “019103” and “Building”, respectively.
- SECTION 090000, SCHEDULE OF FINISHES, Page 4, Floors, QT1, Style, revise “Textures” to read “Tile”.
- SECTION 092400, CEMENT PLASTERING:
 - Page 1:
 - Article 1.2.A.1., revise to read as follows:
 - “Interior plasterwork.”
 - Article 1.5.B., revise to read as follows:

“Interior Plasterwork: Maintain room temperatures at greater than 40 deg F (4.4 deg C) for at least forty-eight (48) hours before plaster application, and continuously during and after application.

1. Avoid conditions that result in plaster drying out during curing period. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
2. Ventilate building spaces as required to remove water in excess of that required for hydrating plaster in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.”

○ Page 3:

- Article 3.3.A., add the following:

“2. Provide plaster surfaces that are ready to receive field-applied finishes indicated.”

- Article 3.3.B., revise “Apply on concrete plaster bases” to read “Apply on substrates for direct application of plaster.”
- Article 3.3.C., revise “¼ inch thick on concrete” to read “in thickness to match existing”.

● SECTION 093000, TILING:

○ Page 4:

- Article 2.3.A., revise “**PFT-1**” to read “**CFT-1, CFT-2, CFT-3**”.
- Article 2.3.A.8.a., revise to read as follows:

“Base: As indicated on Drawings.”

○ Page 5:

- Article 2.3.B.4.a., revise “1.00” to read “0.60”.
- Article 2.3.B.4.b., revise “1.00” to read “0.90”.
- Article 2.3.B.6.a., revise “**QB1**” to read “**QTB-1**”.
- Article 2.3.C., revise “**CWT1, CWT2**” to read “**CWT-1, CWT-2, CWT-3**”.
- Article 2.3.C.4.a., revise “Section 090000 “Schedule of Finishes”” to read “Drawings”.

○ Page 10:

- Article 3.7.A.1.a. and .3.a., revise “**PFT-1**” to read “**CFT-1, CFT-2, CFT-3**”.
- Article 3.7.B.1.a., revise “**CWT1, CWT2**” to read “**CWT-1, CWT-2, CWT-3**”.

● SECTION 096543, LINOLEUM FLOORING, Page 2, Article 2.2, revise “**LN1**” to read “**LSF-1, LSF-2, LSF-3, LSF-4**”.

New Drawings:

- DRAWING A004.1, PHASING PLAN BUILDING CONSTRUCTION PHASE 1 has been added and is attached as part of this addendum.*

- DRAWING A004.2, PHASING PLAN BUILDING CONSTRUCTION PHASE 2 has been added and is attached as part of this addendum.*
- DRAWING A004.3, PHASING PLAN BUILDING CONSTRUCTION PHASE 3 has been added and is attached as part of this addendum.*
- DRAWING SKT01, 5TH GRADE CLASSROOM A117 REMOVAL OF WALL PHONE has been added and is attached as part of this addendum. This sketch revises information on Drawing T203.

Changes to the Drawings:

- DRAWINGS A001.1 & A001.2, GENERAL INFORMATION, List of Drawings, Volume 2:
 - Structural Drawings:
 - Revise “S402” to read “S403”.
 - Add the following:
“S402 ELEVATIONS & BRACE FRAME DETAILS”
 - Food Service Drawings, add the following:
“FS-1.6.2 CAFETERIA FOOD SERVICE EQUIPMENT ELEVATIONS”
- DRAWING A004, PHASING PLAN has been deleted in its entirety.
- DRAWING C700, PHASING PLAN – PHASE ONE has been deleted in its entirety. A new DRAWING C700, PHASING PLAN – SITE CONSTRUCTION PHASE ONE has been added and is attached as part of this addendum.*
- DRAWING C701, PHASING PLAN – PHASE TWO has been deleted in its entirety. A new DRAWING C700, PHASING PLAN – SITE CONSTRUCTION PHASE TWO has been added and is attached as part of this addendum.*
- DRAWING C702, PHASING PLAN – PHASE FOUR has been deleted in its entirety. A new DRAWING C700, PHASING PLAN – SITE CONSTRUCTION PHASE THREE has been added and is attached as part of this addendum.*
- DRAWING A102, FIRST FLOOR PLAN – AREA ‘B’, Cafeteria B105, Elevation Tag, revise “5/A727” to read “5/A726”.
- DRAWING A910, DOOR SCHEDULE AREA ‘A’ & ‘B’, Door Schedule – First Floor Area ‘B’, Saddle Detail, Doors B106A, B106B, B106C and B106D, revise “F” to read “K”.
- DRAWING A912, DOOR & FRAME ELEVATIONS, Saddle Details 3, Type P, delete in its entirety.

The bid dates are unchanged by this addendum.

The addendum consists of one hundred twenty-six (126) pages of 8½” x 11” text, 1 8½” x 11” sketch and six (6) 30” x 42” drawings*.

End of Addendum #1

SECTION 011000 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT DESCRIPTION

- A. The Work of the Project is defined by the Contract Documents and consists of the renovations and additions to an existing elementary school.

1.3 CONTRACTOR USE OF PREMISES

- A. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.
 - 1. Refer to Phasing Drawings for exact delineation of limit lines.
- B. Confine operations to as small work areas and accessways as possible. As much as possible and without damage to the finishes, doors and related building systems, access the project area via the service doors designated by the principals and maintenance staff at the school.
- C. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
- D. Maintain existing egress patterns, exit doors and means of egress during construction, which will include the provision of temporary walkways, sidewalks or other means necessary to provide adequate life safety for the building occupants, particularly at exitways which must continue to be open and serviceable while adjacent construction activity occurs.
- E. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.
 - 1. Contractor is responsible to secure project area/site from intrusions during unoccupied (after hours) period of time. Any temporary doors and /or window coverings that may be necessary to complete repairs are the Contractors responsibility to furnish and install as part of the project scope.

1.4 OWNER OCCUPANCY

- A. Full Owner Occupancy: The Owner's administrative and maintenance staff will occupy the site and existing building during the entire construction period, with children on site during the school year. Cooperate with the Owner during construction operations to minimize conflicts

and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations. Pre-schedule construction operations with the Owner for areas that must be evacuated for extended periods, giving the Owner the opportunity to relocate administrative or educational operations to non-affected areas.

- B. Utility Relocations: Schedule utility relocations that affect the building as early as possible. Coordinate Contractor's schedules with the utility companies and with the Owner to expedite the work while mitigating their interference with the Owner's operation of the building. Schedule protracted utility shut-downs during school vacations or over weekends to prevent any loss of use of building by Owner. Schedule and pay for overtime charges as required to complete the utility relocations and installations.

1.5 SPECIAL REQUIREMENTS

- A. The Contractor shall insure that all work performed is done so in a safe manner and that all of his/her employees shall adhere to all applicable safety procedures and practices at all times. There may be children and staff in the vicinity of the work area during normal working hours. The Contractor shall be aware at all times that additional safety considerations should be taken. Particular care shall be taken by the Contractor, Subcontractors and all those in their employ, that all tools, equipment, ladders, etc. are never left unsupervised.
- B. Meaningful Instruction: Meaningful instruction (as determined by the Owner) must be facilitated and possible within the building at all times. This requirement may limit the Contractor's demolition and construction operations as the distraction represented by hammering, material movement, etc. may disrupt classes. No down time or mobilization charges will be permitted should the meaningful instruction requirement suspend the Contractor's operations for any length of time.
- C. Testing: During the school year, Smarter Balanced Assessment Consortium may be administered to portions of the student population, which requires absolute concentration on the part of the students. The Owner may prohibit operations during the administration of these assessments. Cooperate with the Owner to determine the schedule, locations of the testing and where operations may proceed with disrupting classroom or roofing operations.
- D. Under no circumstances shall the buildings' occupants be subjected to excessive construction noise or vibrations, nor shall they be subject to fumes, odors or other deleterious effects of the operation. Should material delivery, demolition or construction operations, inclement weather or related schedule conditions produce this situation (as determined by the Owner), the Contractor shall be required to suspend operations that produce the offending effects until such time as the building is not occupied, or as approved by the Owner.
 - 1. The school will be open and operational during construction phases. The school administrators reserve the right to halt any construction activity that interrupts school operations, teaching and learning at no additional cost to the project. School hours of operation (referred to as the time while the building is occupied) are Monday through Friday 7:00AM to 5:00PM and evening hours as requested in advance by the Owner. Contractor to work around hours of operation where noted on the phasing plans as well as special dates indicated in Schedule/Phasing Restrictions.
 - 2. Per the order of the local building official and fire marshal all construction activity shall temporarily be halted, both inside the building and on-site, during school fire alarm drills, lock down drills and crisis response drills.

- E. Smoking will not be permitted inside the school building or on the school grounds. Strict adherence to the smoking regulations will be enforced for the entire duration of the construction.
- F. There will be absolutely **no** fraternizing with the students by construction personnel. Anyone caught doing so will be required to leave the jobsite and will not be permitted to return. Such dismissal shall not give the contractor grounds for default on any other contract requirements, including the construction schedule.
- G. Site Security – Identification Badges
 - 1. The Contractor shall provide a list of all contact persons. The list shall include each trade, name of Contractor, contact person(s), phone numbers, fax numbers, Federal Employer Identification Number (FEIN), social security number if FEIN is not available, and Connecticut Tax Registration number.
 - 2. Prior to the start of work all Contractor and Sub-Contractor personnel assigned to perform work shall be required to fill out and submit to a background check at a cost provided by the Contractor. All information shall be submitted to the Town of Ellington, Board of Education and the Resident State Trooper. Information for background check includes the following:
 - a. Identity Verification
 - b. Criminal Background
 - c. Additional checks as deemed warranted
 - 3. Security badges will be worn by all project personnel during construction activities. The Contractor will provide badges at no cost to the Owner. The Contractor will be responsible for monitoring the display of badges, including those of the personnel of all subcontractors and visitors to the project site.

1.6 SCHEDULE/PHASING RESTRICTIONS

- A. Refer to Phasing Drawings for full delineation as well as Substantial Completions Dates as indicated in the Supplementary Instructions to Bidders. Contractor will be required to produce detailed schedules, site staging diagrams and egress patterns prior to commencement of each phase.
- B. The following dates and locations will need to be accommodated in the construction schedule:
 - 1. October 16, 2013 – Ellington EEA Meeting (Library)
 - 2. November 21, 2013 – Brownie Troop 10366 (Café)
 - 3. October 22, 2013 – Boy Scouts (Café)
 - 4. November 4, 2013 – Brownie Troop 10366 (Café)/Registrar of Voters (Gym)
 - 5. November 5, 2013 – Registrar of Voters (Gym)
 - 6. November 12, 2013 – CLS PTO Meeting (Media Center)
 - 7. November 18, 2013 – Brownie Troop 10366 (Café)
 - 8. November 19, 2013 – Boy Scouts (Café)
 - 9. December 2, 2013 – Brownie Troop 10366 (Café)
 - 10. December 11, 2013 – CLS PTO Meeting (Media Center)
 - 11. December 16, 2013 – Brownie Troop 10366 (Café)
 - 12. December 17, 2013 – Boy Scouts (Café)

13. January 13, 2014 – Brownie Troop 10366 (Café)
14. January 14, 2014 – CLS PTO Meeting (Media Center)
15. January 21, 2014 – Boy Scouts (Café)
16. January 27, 2014 – Brownie Troop 10366 (Café)
17. February 10, 2014 – Brownie Troop 10366 (Café)
18. February 11, 2014 – CLS PTO Meeting (Media Center)
19. February 24, 2014 – Brownie Troop 10366 (Café)
20. February 27, 2014 – Family Reading Night
21. March 10, 2014 – Brownie Troop 10366 (Café)
22. March 11, 2014 – CLS PTO Meeting (Media Center)
23. March 18, 2014 – Boy Scouts (Café)
24. March 24, 2014 – Brownie Troop 10366 (Café)
25. April 3, 2014 – Family Math Night
26. April 7, 2014 – Brownie Troop 10366 (Café)
27. April 9, 2014 – CLS PTO Meeting (Media Center)
28. April 21, 2014 – Brownie Troop 10366 (Café)
29. May 5, 2014 – Brownie Troop 10366 (Café)
30. May 7, 2014 – CLS PTO Meeting (Media Center)
31. May 19, 2014 – Brownie Troop 10366 (Café)
32. June 2, 2014 – Brownie Troop 10366 (Café)
33. June 3, 2014 – CLS PTO Meeting (Media Center)
34. September 9, 2013 – April 28, 2014, Monday – Friday - Ellington Recreation Department (Gym)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Modified bituminous sheet waterproofing.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Samples: For each exposed product and for each color and texture specified, including the following products:
 - 1. 8-by-8-inch square of waterproofing and flashing sheet.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

- 1. Do not apply waterproofing in snow, rain, fog, or mist.

- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

- 1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

- 1. **Waterproofing materials in this section must also be compatible with materials in Division 07 Sections 071900 "Under Slab Vapor Barriers" and 072726 "Fluid Applied Membrane Air Barriers".**

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one (1) side to a 4-mil-thick, polyethylene-film reinforcement, and with release liner on adhesive side.

- 1. Basis of Design:

- a. Grace Construction Products; W.R. Grace & Co. -- Conn; **Bituthene 3000/Low Temperature**

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

- a. Carlisle Coatings & Waterproofing Inc; **CCW MiraDRI 860/861**
 - b. Meadows, W.R.,Inc; **SealTight Mel-Rol**

- c. Tamko Building Products, Inc; **TW-60**
 - d. Substitutions: Under provisions of Section 012500 "Substitution Procedures".
3. Physical Properties:
- a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
 - d. Crack Cycling: Unaffected after one hundred (100) cycles of 1/8-inch movement; ASTM C 836.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E 154.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
 - g. Water Vapor Permeance: 0.05 perms maximum; ASTM E 96, Water Method.
4. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Primer: Liquid solvent-borne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- D. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

2.4 INSULATION

- A. Insulation, General: Comply with Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
 - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.
- F. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
 - 1. Install membrane strips centered over vertical inside corners. Install ¾-inch fillets of liquid membrane on horizontal inside corners and as follows:
 - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
- G. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2½-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
 - 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

- E. Seal edges of sheet-waterproofing terminations with mastic.
- F. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.

3.4 INSULATION INSTALLATION

- A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within $\frac{3}{4}$ inch of projections and penetrations.
- B. On vertical surfaces, set insulation units in adhesive or tape applied according to manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

- A. Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish daily reports to Architect.
- B. Prepare test and inspection reports.

3.6 PROTECTION, REPAIR, AND CLEANING

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Protect installed board insulation from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071326

SECTION 071900 – UNDER SLAB VAPOR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes

- 1. Sheet and sealant materials to provide a continuous air and vapor infiltration barrier throughout the building envelope

B. Related Sections

- 1. Section 033100 “Concrete Work”
- 2. Section 071326 “Self-Adhering Sheet Waterproofing”
- 3. Section 072726 “Fluid Applied Membrane Air Barriers”
- 4. Section 079200 “Joint Sealants”

1.3 PERFORMANCE REQUIREMENTS

- A. Materials of this Section shall provide continuity of building enclosure vapor and air barrier:

- 1. In conjunction with materials described in Section 072900 “Joint Sealants”.
- 2. To seal gaps between building enclosure components and wall and roof opening frames.

- B. **Vapor barrier materials in this section must also be compatible with materials in Division 07 Sections 0711326 “Self-Adhering Sheet Waterproofing” and 072726 “Fluid Applied Membrane Air Barriers”.**

1.4 SUBMITTALS

- A. Product Data: Provide data indicating material characteristics, performance criteria and limitations.

- B. Manufacturer's Installation Instructions: Indicate preparation and installation requirements and techniques.

- C. Shop Drawings: For vapor-barrier assemblies.

- 1. Show locations and extent of vapor barrier. Include details for joints, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
- 2. Include details of interfaces with other materials that form part of vapor barrier.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each vapor-barrier assembly, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect stored materials from direct sunlight.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Barrier: ASTM E 1745; provide vapor barrier cover over prepared subbase material where indicated, or below slabs on grade. Use only materials which have a vapor permeance of 0.10 perms or less when tested in accordance with ASTM E 9, Procedure A.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Grace Construction Products; **Florprufe 120**
 - b. Stego Industries, LLC; **Stego Wrap 15-Mil with Crete-Claw Tape**
 - c. Substitutions: Under provisions of Section 012500 "Substitution Procedures".

2.2 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by vapor-barrier manufacturer to produce a complete vapor-barrier assembly and compatible with primary vapor-barrier membrane.
- B. Tape: Polyethylene self-adhering type, mesh reinforced, 2 inch wide, compatible with sheet material.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, or other contaminants.
 - 2. Verify that surfaces and conditions are ready to accept the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose or foreign matter which might impair adhesion.

3.3 INSTALLATION

- A. Install sheet materials in accordance with manufacturer's instructions.
- B. Install sealant tape in accordance with manufacturer's instructions.
- C. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 CLEANING AND PROTECTION

- A. Protect vapor-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect vapor barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than thirty (30) days, remove and replace vapor barrier or install additional, full-thickness, vapor-barrier application after repairing and preparing the overexposed membrane according to vapor-barrier manufacturer's written instructions.
 - 2. Protect vapor barrier from contact with incompatible materials and sealants not approved by vapor-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed Work, using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071900

SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes standing-seam metal roof panels.
- B. Related Sections:
 - 1. Section 074213.23 "Metal Composite Material Wall Panels" for metal panels used in horizontal soffit and fascia applications.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. HPBS Submittals:
 - 1. Product Test Reports for Section 16a-38k-6(e)(11): For roofing materials, documentation indicating that roofing materials comply with Solar Reflectance Index requirement.
- C. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1½ inches per 12 inches.
- D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 1. Build mockup of typical roof area and eave, including fascia as shown on Drawings; approximately 48 inches square by full thickness, including attachments, underlayment, and accessories.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate metal panel installation with flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Solar Reflectance Index: Not less than 29 when calculated according to ASTM E 1980.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure for cladding as calculated in accordance with Section 1504.3 of the 2005 Connecticut State Building Code (CSBC).
- C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft.
- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
1. Uplift Rating: UL 90.
- F. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
1. Fire/Windstorm Classification: Class 1A-105.
 2. Hail Resistance: MH.
- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
1. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and mechanically seaming panels together.
1. Basis of Design:
 - a. Merchant & Evans Inc.; **Zip Rib**
 2. Acceptable Manufacturers:
 - a. Centria
 - b. Innovative Metals Company
 - c. Firestone Building Products, LLC
 - d. Substitutions: Under provisions of Section 012500 "Substitution Procedures".

3. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.050 inch.
 - b. Surface: Smooth, flat finish.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: As selected by Architect and Owner from manufacturer's full range.
4. Clips: Two-piece floating to accommodate thermal movement.
 - a. Material: Minimum 20 gauge, stainless-steel sheet.
5. Joint Type: Single folded.
6. Panel Coverage: 16 inches.
7. Panel Height: 2.5 inches.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.

2.4 MISCELLANEOUS MATERIALS

- A. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- C. Panel Fasteners: Self-tapping screws designed to withstand design loads.
- D. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, one hundred percent (100%) solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if

they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than seventy percent (70%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3½ inches. Roll laps with roller. Cover underlayment within fourteen (14) days.
 1. Apply over the entire roof surface.
- B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
1. Install clips to supports with self-tapping fasteners.
 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 3. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of ¼ inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

SECTION 074213.19 - INSULATED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Single-skin, labyrinth-joint metal cladding panels for rainscreen-principle wall system, complete with sub-structural metal framing, perimeter and penetration flashing, and closures.
2. Air and water resistive barrier self-adhering, vapor permeable flexible sheet membrane system including all necessary sheet goods, flashing, tapes, mastics and sealants.
3. Continuous exterior thermal board insulation for rainscreen wall application.

B. Related Requirements:

1. Section 051200 "Structural Steel" for steel studs, girts and furring.
2. Section 061600 "Sheathing" for gypsum and wood sheathing.
3. Section 076200 "Sheet Metal Flashing and Trim" for flashing and sheet metal.
4. Section 079200 "Joint Sealants" for joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Show complete rainscreen wall system with air and water barrier, continuous exterior insulation, subframing system, metal cladding panels, ventilation components, flashings and accessories in elevation, sections, and details. Include metal thicknesses and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations. Indicate relationships with adjacent and interfacing work.
2. All components shall be integrated into a single comprehensive and complete shop drawing set prepared by the metal cladding system manufacturer.
3. Shop drawings shall identify each product and component by manufacturer, product name, and thickness, size, style, or other uniquely distinguishing characteristics.

4. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1½ inches per 12 inches.
 5. Shop drawings shall be signed and sealed by a Professional Engineer or Registered Architect authorized to practice in the jurisdiction of the project location.
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.
1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.
 2. Air Barrier: 10 inches by 10 inches, minimum.
 3. Rigid Board Insulation: 6 inches long by 6 inches wide, of same thickness and properties as specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 1. Engage an experienced metal wall contractor (erector) to install wall panel system who has a minimum of three (3) years' experience specializing in the installation of rainscreen metal wall systems.
 2. Engage an experienced air barrier contractor (installer) to install self-adhering, water resistive, vapor permeable air barrier system who has a minimum of three (3) years of experience specializing in the installation of air barrier systems.
 3. Engage an experienced wall system contractor (erector) to install insulation system who has a minimum of three (3) years' experience specializing in the installation of continuous exterior board insulation in a rainscreen type application.
- B. Air Barrier Quality Assurance Auditing.

1. The air barrier manufacturer shall provide an accredited third party air barrier auditor/inspector at the beginning and end of the air barrier installation, and at no fewer intermediate intervals than once per 20,000 square feet of air barrier installation.
 2. The air barrier auditor/inspector shall have sufficient credential to satisfy the Architect, such as Air Barrier Association of America (ABAA) certification, RCI Registered Exterior Wall Consultant, or similar professional experience and credentials.
 3. The air barrier installer shall perform daily inspections, tests, reporting, and other information as requested by the third party auditor/inspector.
 4. The air barrier installer shall coordinate, cooperate, and comply with the recommendations of the third party auditor/inspector.
- C. Successful contractor must obtain all components of rainscreen wall system from a single manufacturer. Any secondary products that are required which cannot be supplied by the specified manufacturer must be recommended and approved in writing by primary manufacturer prior to bidding.
- D. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Build mockup of typical metal panel assembly as shown on Drawings, 6 feet long by 6 feet wide, including sheathing substrate, window frame and attachment method, clips, subframing, attachment of insulation, detailing of air barrier, and accessories.
 2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
 - B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
 - C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
 - D. Retain strippable protective covering on metal panels during installation.
- 1.9 FIELD CONDITIONS
- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of rainscreen panel system to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of windows, doors, and wall penetrations with actual equipment provided.
- B. Coordinate metal wall cladding and insulation system with wall sheathing, masonry, air and water resistive barriers, thermal insulation, rain drainage work, flashing, trim, and construction of other adjoining work to provide a leak proof, secure, and noncorrosive installation.
- C. Coordinate air barrier continuity and connections with adjacent surfaces, such as roof, foundation, and changes in wall construction.

1.11 WARRANTY

- A. Special Warranty: The metal wall cladding system must be approved for use in the rainscreen wall assembly in conjunction with the air and water resistive barrier and exterior continuous insulation system; the use of specified metal wall cladding system shall not nullify any manufacturers' warranties required elsewhere in this specification. In particular, the use of the specified, substitute, or alternate metal wall cladding panel system shall be certified prior to bid by the air and water resistive barrier manufacturer as acceptable for furnishing the warranty required of the air and water resistive barrier manufacturer.
 - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.
- C. Special Installation Warranty: Three (3) years from date of Substantial Completion for wall panel system installation and water tightness.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Rainscreen Wall System Performance Rating. The metal wall panel assemblies, and the substructural furring/framing system supporting the panels shall be tested in accordance with AAMA 509 and achieve the following performance results:
 - 1. Water Infiltration: The water infiltration performance of the metal wall panel assembly shall not exceed the classification of W-1.
 - 2. Back Ventilation: The air ventilation performance of the rainscreen cavity air space shall have a minimum classification of V-4.

- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 72:
1. Wind Loads: As indicated on Drawings.
 2. Installed wall system shall withstand negative wind pressures complying with the following criteria.
 - a. Design Code: ASCE 7-05, Method 2 for Components and Cladding.
 - b. Safety Factor: The metal panel system shall be tested to proof load of 1.5 times the design service load condition, as required by the ASTM E 330 method.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. The design temperature differential shall be not less than 220 degrees Fahrenheit.
- D. Air Barrier Performance: Self-adhering water resistive air barrier system shall be furnished and installed without failure due to defective manufacture, fabrication, installation, or other defects in construction.
1. Air Leakage.
 - a. The self-adhering air barrier shall have less than 0.01 cfm/ft² of air leakage when tested in accordance with ASTM E 2357.
 - b. The self-adhering air barrier shall have less than 0.0040 cfm/ft² at 1.57 psf when tested in accordance with ASTM E 2178.
 - c. The self-adhesive air barrier and metal cladding panel specified shall be jointly tested as an assembly in accordance with ASTM E 283 with an air leakage rate of less than 0.04 cfm/ft² at 1.57 psf.
 2. Water Resistance.
 - a. The self-adhering air barrier shall be tested for water resistance in accordance with AATCC 127 with a result of No Leakage after five (5) hours with a 21.5-inch hydrostatic water head.
 - b. The self-adhesive air barrier and metal cladding panel specified shall be jointly tested as an assembly in accordance with ASTM E 331 with no uncontrolled leakage at 1.57 psf and 6.24 psf.
 3. Vapor Permeance: The self-adhering air barrier shall be vapor permeable with a minimum vapor transmission rate of 50 perms when tested in accordance with ASTM E 96, Method B.
 4. Physical Properties
 - a. Low Temperature Flexibility: The self-adhering air barrier shall demonstrate acceptable low temperature flexibility in accordance with the requirements of ASTM D 1970.
 - b. Bend Test: The self-adhering air barrier shall demonstrate acceptable bend flexibility in accordance with the requirements of ICC AC38 3.3.4.

- c. Peel Adhesion: The self-adhering air barrier shall exhibit a 90 degree peel adhesion in accordance with AAMA 711-5.3 and ASTM D 3330.
 - d. Wet Adhesion: The self-adhering air barrier shall demonstrate acceptable adhesion after immersion in water in accordance with the requirements of AAMA 711-5.8.
 - e. Puncture Resistance: The self-adhering air barrier shall demonstrate a minimum puncture resistance of 75 lbf in accordance with ASTM E 154.
 - f. Elevated Temperature: The self-adhering air barrier shall be suitable for use at an elevated temperature of 176°F (80°C) in accordance with the requirements of AAMA 771-5.5 and ASTM D 3330 Level 3.
 - g. Breaking Strength: The self-adhering air barrier shall have a minimum breaking strength and elongation at break of 70 lbf/in and twenty-five percent (25%) in the machine direction, and a minimum of 65 lbf/in and sixty percent (60%) in the cross-machine direction when tested in accordance with ASTM D 5034.
 - h. Tearing Strength: The self-adhering air barrier shall have a minimum trapezoidal tearing strength of 21 lbf/in in the machine direction, and a minimum of 14 lbf/in in the cross-machine direction when tested in accordance with ASTM D 4533.
 - i. Linear Dimensional Change: The self-adhering air barrier shall have a change in linear dimension at elevated temperatures in accordance with ASTM D 1204 of no more than 1.5% in the machine direction and 0.1% in the cross-machine direction.
 - j. Crack Bridging Ability: The self-adhering air barrier shall have a demonstrated ability to bridge cracks in the substrate material in accordance with the requirements of ASTM C 1305 at a temperature of -15°F (-26°C).
 - k. Cyclical Thermal Change: The self-adhering air barrier shall demonstrate acceptable performance for thermal cycling in accordance with the requirements of AAMA 711-5.6.
 - l. Surface Burning Characteristics: The self-adhering air barrier shall have be rated as Class A material with a flame spread rating of less than 15 and a smoke-development index of less than 50 when tested in accordance with ASTM E 84.
- E. Insulation Performance: Continuous exterior rigid mineral fiber board thermal insulation shall satisfy all requirements of ASTM E 612, Type IV-B, shall be free of defects, and meet each of the performance requirements specified herein.
- 1. Thermal Resistance:
 - a. At 25°F (-4°C), the R-value (RSI-value) per inch thickness shall be 4.3 hr•ft²•°F/BTU minimum, in accordance with ASTM C 518/C 177.
 - b. At 75°F (24°C), the R-value per inch thickness shall be 3.9 hr•ft²•°F/BTU minimum, in accordance with ASTM C 518/C 177.
 - 2. Fire and Heat Performance:
 - a. Surface Burning Characteristics: Flame spread rating shall be 0 and smoke development rating shall be 0 when tested in accordance with ASTM E 84.
 - b. Combustibility: The board insulation shall be rated as “Non-Combustible” when tested in accordance with ULC S114.
 - c. The board insulation shall not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat at 1,382°F (750°C), in accordance ASTM E 136.
 - d. The board insulation shall be considered “Non-Combustible” when tested in accordance with NFPA 268, and shall be deemed to be acceptable for use in

- exterior walls of Type I, II, III, and IV building construction without any constraints, such as use of a thermal barrier, as may be required by NFPA 285.
- e. The board insulation shall be rated for a 1,200°F (650°C) service temperature, as determined by testing in accordance with ASTM C 411.
3. Moisture Resistance:
- a. Water absorption, as measured in accordance with ASTM C 209, shall not exceed 1.2%.
 - b. Water vapor absorption, as measured in accordance with ASTM C 1104, shall not exceed 0.30%.
 - c. Water vapor transmission, as measured in accordance with ASTM E 96, shall be at least 40 perms.
4. Dimensional Stability and Physical Properties:
- a. The board insulation shall have a minimum density of 11.0 pcf as measured in accordance with ASTM C 612.
 - b. The board insulation shall have a minimum compressive strength of 1,220 psf at ten percent (10%) maximum deformation when tested in accordance with ASTM C 165.
 - c. The board insulation shall have a maximum of 0.38% linear shrinkage at 1,200°F (650°C) when tested in accordance with ASTM C 356.
 - d. The board insulation shall exhibit dimensional stability of a maximum linear change of 0.1% after seven (7) days in accordance with ASTM D 2126 at each of the following climate conditions:
 - 1) 40°F (-4°C) with ambient relative humidity;
 - 2) 200°F (93°C) with ambient relative humidity;
 - 3) 158°F (70°C) with 97% relative humidity.
5. Acoustical Performance: When tested in accordance with ASTM C 423, a 2-inch insulation board shall have a NRC rating of 0.85 minimum.
6. Corrosion Resistance:
- a. The insulation board shall be rated “Non-corrosive” to steel when tested in accordance with ASTM C 665.
 - b. The insulation board shall conform to the requirements of ASTM C 795 with respect to corrosion resistance in contact with stainless steel materials.

2.2 CONCEALED CLIP – REVEAL JOINT METAL WALL PANELS

- A. General: Provide factory-formed metal wall panels designed to be field assembled by interlocking seams and incorporating concealed fasteners.
- B. Concealed clip, longitudinal lap-seam panel with labyrinth-joint and reveal on four (4) sides.
 - 1. Basis of Design:
 - a. Innovative Metals Company, Inc. (IMETCO); **Latitude-RS**
 - b. Substitutions: Under provisions of section 012500 “Substitution Procedures”.

2. Aluminum Sheet: Provide facings of aluminum coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness:
 - 1) 6'-0" aff and below: 0.050 inch.
 - 2) Above 6'-0": 0.040 inch.
 - b. Surface: Smooth, flat finish.
 - c. Finish: Two-coat fluoropolymer.
 - 1) Color: As selected by Architect and Owner from manufacturer's full range.
3. Characteristics.
 - a. Fabrication: Panels shall be factory formed from specified metal.
 - b. Profile: Flat pans with reveal joints on all four (4) sides.
 - c. Panel Orientation: Horizontal.
 - d. Configuration: Various sizes as depicted on Drawings, with interlocking seams incorporating concealed fasteners.
 - e. Panel Depth (Concealed Leg Height): 7/8 inch, nominal.
 - f. Reveal Joint: Panel seams shall join such that adjacent panels form vertical and horizontal reveal joints 3/4-inch-wide.
 - g. End Folds: Panel ends shall be factory notched by automatic mechanical press equipment to form end tabs of 5/8 inch nominal length. The end tabs shall be factory folded 90 degrees to produce a "box pan" effect and allow for reveal joints on all four (4) sides of the panel.

2.3 "RIBBED" METAL WALL PANELS

- A. General: Provide factory-formed metal wall panels designed to be field assembled by interlocking seams and incorporating concealed anchor clips, allowing thermal movement.
- B. Concealed clip, lap-seam panel with 1 inch reveal at horizontal joints.
 1. Basis of Design:
 - a. Innovative Metals Company, Inc.; **Latitude**
 - b. Substitutions: Under provisions of section 012500 "Substitution Procedures".
 2. Aluminum Sheet: Provide facings of aluminum coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness:
 - 1) 6'-0" aff and below: 0.050 inch.
 - 2) Above 6'-0": 0.040 inch.
 - b. Surface: Smooth, flat finish.

- c. Finish: Two-coat fluoropolymer.
 - 1) Color: As selected by Architect and Owner from manufacturer's full range.

3. Characteristics.

- a. Fabrication: Panels shall be factory formed from specified metal.
- b. Profile: 1 inch horizontal reveal with symmetrical angle of the web elements of the ribs.
- c. Panel Orientation: Horizontal.
- d. Configuration: Various sizes as depicted on Drawings, with interlocking seams incorporating concealed anchor clips allowing thermal movement.
- e. Panel Depth (Concealed Leg Height): 7/8 inch, nominal.
- f. Anchor Clips: Clips shall be 18 gauge galvanized steel designed to allow thermal movement of the panel in each direction along the longitudinal dimension.

2.4 METAL SUBFRAMING

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653, G90 coating designation. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

- B. Horizontal Hat-shaped Vented Girts:

- 1. Dimensions:

- a. Nominal Thickness: 18 gauge nominal thickness.
 - b. Depth: 1-inch nominal.
 - c. Top flange: 2-5/8 inches nominal.
 - d. Bottom Flanges: 1½ inches nominal with ¼ inch holes punched at 8 inches on center in each flange.

- 2. Free Air Flow: The vented girt shall not restrict chimney effect air convection in the vertical direction. The vented girt webs shall have slotted holes providing for thirty-one percent (31%) free air flow and weep holes for water drainage.

- 3. Drainage: Web segments of vented girt shall be formed such that when installed in the horizontal orientation the web segments are inclined at least 15 degrees from horizontal to promote drainage and prevent retention of standing water.

- C. Fasteners for Metal Subframing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal subframing members through insulation and sheathing boards into structural wall framing or substrates.

2.5 AIR BARRIER MEMBRANE

- A. General: Obtain all primary air barrier components and accessories from the same supplier to ensure total system compatibility and integrity.

- 1. Basis of Design:

- a. Innovative Metals Company, Inc.

b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.

B. Air Barrier Membrane Materials:

1. Basis of Design: **IntelliWrap SA**
2. Material: Multi-layer UV stabilized self-adhering vapor permeable sheet membrane comprised of two (2) high strength spun-bonded polypropylene fabric outer layers thermally bonded to a highly vapor permeable, watertight polymeric middle layer.
3. Weight: 40 lbs per roll.
4. Allowable UV Exposure: Fifty (50) days.
5. Application Temperature: Ambient temperature must be above 40 °F (5 °C).
6. Service Temperature: -40 °F to 176 °F (-40 °C to 80 °C).
7. Roll Dimensions: 59-inches wide by 115-ft long.

C. Air Barrier Transition and Flashing Membrane:

1. Basis of Design: **IntelliWrap Flashing SA**
2. Material: Self-adhering, water-resistive, vapor permeable membrane flashing sheet with properties the same as those of the Air Barrier Membrane.
3. Roll Dimensions: 4-inches or 9-inches wide by 75-ft long.

D. Air Barrier Flashing and Penetration Tapes:

1. Basis of Design: **IntelliWrap Tape**
2. Material: UV stabilized double or single sided moisture-resistant flexible tape with adhesive backing.
3. Single-Sided: 2.5-inches wide penetration seam tape.

E. Preformed Window and Door Corners:

1. Basis of Design: **IntelliWrap SA Factory Formed Corners**
2. Material: 18-inch by 18-inch preformed 90° inside corner membrane with the same vapor permeance, resistance to air leakage, and physical properties as the primary air barrier membrane.

2.6 INSULATION

A. Mineral fiber rigid board insulation.

1. Basis of Design:
 - a. Innovative Metals Company, Inc.; **HD Stonewool CIS**
 - b. Substitutions: Under provisions of Section 012500 “Substitution Procedures”.
2. Material: Basalt rock and slag mineral fiber board insulation, Type IV-B in accordance with ASTM C 612.
3. Thickness: 4-inches.

2.7 ACCESSORIES

- A. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Non-curing, one hundred percent (100%) solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1 inch wide and 1/16 inch thick.
 2. Exposed Sealant: ASTM C 920; elastomeric triopolymer, polyurethane or other advanced polymer sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 3. Concealed Sealant: ASTM C 1311; butyl-based, solved-release, one-part sealant.
- B. Wall Panel Accessories: Provide components approved by panel manufacturer and as required for a complete metal wall panel assembly including trim, corner units, closures, clips, flashings, sealants, gaskets, fillers, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
1. Anchor Clips: Clips shall be 18 gauge stainless steel designed to allow thermal movement of the panel in each direction along the longitudinal dimension.
 2. Spline Strip at Vertical Reveal: At the vertical reveal joint sheet metal spline material shall be provided in the same material type and finish as the metal cladding panels for all visible space at the reveal joint. Spine strip material thickness shall be as recommended by manufacturer based on installation tolerances.
 3. Corner Units: Provide factory fabricated mitered corner units of the same profile(s) as specified. Corner units shall be furnished for outside and inside corner conditions.
 4. Ventilation strips shall be provided at top of wall panels, window sills, and transitions between metal panels and other exterior finish materials to allow for air exhaust at top of wall cavity. Vent strips shall be internally baffled to prevent wind driven rain from freely entering the wall cavity.
 5. Ventilation strips shall be provided at base of wall panels, window head, and transitions between metal panels and other exterior finish materials to allow for air intake and water weep holes at bottom of wall cavity.
- C. Flashing and Trim: Formed from same material, finish, and gauge as wall panels. Provide flashing and trim as required to provide finished appearance. Locations include, but are not limited to, head, sill, corners, jambs, framed openings, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels.
- D. Insulation Board Fasteners: Corrosion resistant steel screws, #10 minimum diameter x length appropriate for substrate. Use four (4) screws minimum per insulation board.

2.8 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory to the greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Form flashing components from full single width sheet in minimum 10 foot sections. Provide mitered trim corners, joined using closed end pop rivets and butyl-based, solvent released one-part sealant.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Sealed Joints: Form nonexpanding, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.
- E. Use full size insulation boards to the greatest extent possible. As necessary size boards to fit at openings and elevation terminations with neat and straight cuts. Size boards to fit tightly together without gaps or voids.

2.9 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Aluminum Panels and Accessories:
 - 1. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than seventy percent (70%) PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
- B. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and take suitable measurements until substrate passes moisture test.
- C. Verify all surfaces are dry, sound, clean, and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the water resistive air barrier membrane and flashings. Fill voids and gaps in substrate greater than ¼-inch in width to provide an even surface. Strike masonry joints full-flush.
- D. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with the sheathing and fastened into solid backing material.
- E. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through water-resistive air barrier and at protrusions.
- C. Establish straight, side and crosswise benchmarks
- D. All walls shall be checked for square and straightness. Inside and outside corners may not be plumb; set a true line for the corner flashing with string line.
- E. Measure the wall lengthwise to confirm panel lengths and verify clearances for thermal movement.
- F. Ensure all preparatory work is complete prior to applying primary self-adhering water-resistive air barrier sheet membrane.
- G. Prime surfaces as recommended by air barrier manufacturer.

- H. Minimum application temperature of self-adhered membrane and flashings to be above 40 °F (5 °C).
- I. Use proper size and length fastener for strength requirements to attach insulation boards. Attachment of insulations boards shall be done in a manner sufficient to adequately secure the insulations to the wall substrate until such time as the exterior cladding is fully secured in place.

3.3 METAL SUBFRAMING INSTALLATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
- B. Install metal subframing directly over continuous thermal insulation. Metal subframing shall attach to the structural wall elements with screw fasteners. Metal subframing shall be spaced as necessary to accommodate the required clip spacing for the metal cladding panels.
- C. Attachments shall be as recommended by the metal claddings system manufacturer's approved shop drawings.

3.4 METAL WALL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
- B. Directly over the completed wall substrate, fasten the top flange of the panel to the metal subframing using panel clips. All panels clips will be fastened into the metal subframing as indicated on the metal cladding panel manufacturer's approved shop drawings.
- C. Installation of Wall Panels: Wall panels can be installed by starting from one (1) end and working towards the opposite end (vertical orientation), or from the bottom of wall working towards the top of the wall (horizontal orientation).
- D. Metal wall panels and trim must be installed only in accordance with the manufacturer's recommendation for acceptable temperature range.
- E. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.
- F. Limit exposed fasteners to extent indicated on contract drawings.
- G. Seal laps and joints in accordance with metal cladding panel system manufacturer's product data.
- H. Coordinate flashing and sheet metal work to provide weathertight conditions at wall terminations. Fabricate and install in accordance with standards of SMACNA Manual.

- I. Provide for temperature expansion/contraction movement of panels at wall penetrations and wall mounted equipment in accordance with system manufacturer's product data and design calculations.
- J. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.
- K. At joints in linear sheet metal items, other than metal cladding panels which are intended to provide ventilation, set sheet metal items in two (2) ¼-inch beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

3.5 AIR BARRIER INSTALLATION

A. Coordination and Sequence.

- 1. Install self-adhered water-resistive air barrier sheet complete and continuous to the substrate in a sequential overlapping weatherboard method starting at bottom or base of wall and working upward.
- 2. Complete detail work around corners, wall openings, building transitions and penetrations prior to field applications.
- 3. Install self-adhering air barrier membrane over the outside face of exterior sheathing board or substrate, measured and precut into manageable size sheet to suit the application conditions.
- 4. Stagger all end-lap seams.
- 5. Roll installed membrane with roller to ensure positive contact and adhesion.
- 6. At changes in substrate plane, provide transition material (bead of sealant, mastic, extruded silicone sealant, membrane counterflashing, or other material recommended by manufacturer) under membrane to eliminate all sharp 90° inside corners and to make a smooth transition from one (1) plane to another.
- 7. At end of each working day, seal top edge of membrane to substrate with termination mastic.

B. Window, Door, and Other Wall Openings.

- 1. To avoid waste, predetermine best method and sequence to the install self-adhered air barrier transition and flashing membrane around window or wall openings subject to the opening size and installation of window, door or louver type.
- 2. Wrap self-adhered air barrier transition and flashing membrane into wall openings to cover sill, jambs and head. It is not required to install continuous sheets through corners.
- 3. Remove release film, align flashing membrane and apply pressure to ensure positive contact. Roll Lap seams to ensure adhesion. Provide lap seams to shed water.
- 4. Install preformed corner flashing membrane into corners over flashing membrane. Secure preformed corners into position with flashing tape and seal to self-adhered air barrier.
- 5. Subject to window installation requirements, install preformed sill pan system and seal to installed self-adhered air barrier window flashing membrane with sealant.
- 6. Install windows in accordance with window manufacturer's details and cover nail flange with flashing tape. Install flashing tape along jamb and across head flanges of window

and seal to installed self-adhered air barrier transition membrane. Roll tape to ensure positive contact to substrate. Seal exposed leading edge of tape.

7. For windows without nail flange, install specified aluminized tape around perimeter of opening to accommodate placement of backer rod and sealant between window frame and self-adhered vapor permeable air barrier membrane.

C. Inside and Outside Corners.

1. Pre-treat inside and outside corners with self-adhered air barrier transition and flashing membrane extending a minimum of 5-inches from inside and outside corners, or overlap field material a minimum of 3-inches in each direction.
2. Align and position self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 3-inches overlap at all side laps and minimum 3-inches overlap at all end laps of membrane.
3. Roll membrane and lap seams with roller to ensure positive contact and adhesion.

D. Building Transition Conditions.

1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials with self-adhering air barrier transition and flashing membrane.
2. Align and position self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 3-inches lap on to substrates.
3. Ensure minimum 3-inches overlap at side and end laps of membrane.
4. Roll membrane and lap seams with roller to ensure positive contact and adhesion.
5. Connect air and water barrier in exterior wall assembly continuously to the air barrier of the roof, to concrete below-grade structures, to windows, curtain wall, storefront, louvers, exterior doors and other intersection conditions and perform sealing of penetrations, using accessory materials and in accordance with the manufacturer's recommendations.
6. Provide mechanically fastened non-corrosive metal sheet to span gaps in substrate plane and to make a smooth transition from one plane to the other. Membrane shall be continuously supported by substrate.
7. At deflection and control joints, provide backup for the membrane to accommodate anticipated movement.
8. At expansion and seismic joints provide transition to the joint assemblies.
9. Apply a bead or trowel coat of mastic along membrane seams at reverse lapped seams, rough cuts, and as recommended by the manufacturer.

E. Mechanical Equipment Penetrations.

1. Mechanical pipe, electrical conduit and/or duct work must be secured solid into position prior to installation of self-adhered vapor permeable air barrier membrane.
2. Electrical services penetrating the wall assembly and self-adhered vapor permeable air barrier membrane must be placed in appropriate conduit and secured solid into position.
3. Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.
4. For straight sided penetrations, cut and fit self-adhered vapor permeable air barrier to accommodate sleeve, install specified single sided flashing tape to seal the air barrier membrane to ductwork or preformed flange sleeve.
5. For pipe penetrations, refer to manufacturer's standard details.

6. Seal around all penetrations with termination mastic, extruded silicone sealant, membrane counterflashing or other procedure in accordance with manufacturer's recommendations.
7. At through-wall flashings, provide an additional 6-inches wide strip of manufacturer's recommended membrane counterflashing to seal top of through-wall flashing to membrane. Seal exposed top edge of strip with bead of mastic as recommended by manufacturer.

F. Field Membrane Installation.

1. Align sheets and begin installation of water-resistive weather barrier at bottom or lowest point of wall.
2. To avoid wrinkles and miss-alignment of subsequent applications it is recommended to pre-mark or "Snap" a level line to work from. Measure and pre-cut into manageable sized sheets to suit the application conditions.
3. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.
4. Align and position self-adhered membrane, remove release film and press firmly into place. Provide minimum 3-inches overlap at all side and end laps of membrane. Roll membrane and lap seams with roller to ensure contact and adhesion.
5. Continue to remove release film and apply pressure to ensure positive contact onto wall substrate.
6. Install subsequent sheets of self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lap seams with roller to ensure contact and adhesion.

3.6 ERECTION TOLERANCES

A. Installation Tolerances:

1. Shim and align metal wall panel units within installed tolerance of ¼ inch in 20 feet at location lines as indicated and within 1/16-inch offset of adjoining faces and of alignment of matching profiles.
2. Install insulation board units within installed flatness tolerance of no more than ¼ inch in 20 feet at location lines as indicated and within no more than 1/8-inch offset of adjoining edges. Gap between boards shall be no more than 1/8-inch. Insulation boards shall be installed in continuous contact with back-up wall exterior surface.

3.7 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- B. Metal wall panels will be considered defective if they do not pass test and inspections.
- C. Third Party Air Barrier Installation Audits: Cooperate with the third party air barrier auditor/inspector. Allow access to work areas and staging. Notify Owner's testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted.
- D. Remove and replace applications of air barrier membrane system and insulation boards where inspections indicate that they do not comply with specified requirements.

- E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- F. Prepare test and inspection reports.

3.8 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Touch up exposed fasteners using paint furnished by the panel manufacturer and matching exposed panel surface finish.
- C. Clean exposed surfaces of wall panels and accessories after completion of installation. Leave in clean condition at date of Substantial Completion. Touch up minor abrasions and scratches in finish.
- D. Replace metal panels and insulation boards that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- E. Remove damaged work and replace with new, undamaged components.
- F. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- G. Protect wall areas covered with self-adhered water-resistive vapor permeable air barrier from damage due to construction activities, high wind conditions, and extended exposure to inclement weather.
- H. Review condition of self-adhered water-resistive vapor permeable air barrier prior to installation of cladding. Repair, or remove and replace damaged sections with new membrane.
- I. Recommend to cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed self-adhered water-resistive vapor permeable air barrier installations.
- J. Do not allow materials to come in contact with chemically incompatible materials.
- K. Do not expose membrane to sunlight longer than as recommended by the manufacturer.
- L. Remove and replace water-resistive weather barrier membrane affected by chemical spills or surfactants.

END OF SECTION 074213.19

SECTION 01 4127 STORMWATER GENERAL PERMIT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Adherence to the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (DEP-PED-GP-015, modified October 1, 2013 or otherwise latest issued version, hereinafter “Stormwater General Permit”, including the Stormwater Pollution Control Plan (SWPCP).
- B. Compliance with all conditions of the aforementioned Stormwater General Permit, excluding the following, which will be provided by BSC:
 - 1. BS shall maintain a rain gauge on site.
 - 2. BSC shall provide a qualified inspector to inspect erosion control measures and prepare monthly inspection reports.
 - 3. BSC shall take monthly samples of stormwater, prepare turbidity monitoring reports and submit to CT DEEP. Contractor is responsible for all costs associated with the general permit including, but not limited to, the laboratory costs for stormwater sample analysis.
- C. The Contractor shall provide his own weekly inspections and repair erosion control measures as required, and as directed by the BSC Group.

1.2 SUBMITTALS

- A. Contractor shall maintain copies of all permit-related documents at the Project Site and shall make them available during construction, and provide copies to the Engineer. Permit-related documents include, but are not necessarily limited to, the following:
 - 1. Registration form for the Stormwater General Permit prescribed and provided by the Connecticut Department of Environmental Protection, hereinafter CTDEEP.
 - 2. Additional information as required by the CTDEEP deemed necessary to evaluate the consistency of the subject activity with the requirements for authorization under the Stormwater General Permit.
 - 3. Documents or correspondences between Contractor and CTDEEP, local authorities, wetland agencies, etc. including notices of violation, enforcement actions, or proposed fines by regulatory agencies.
 - 4. Notice of Termination forms prescribed and provided by CTDEEP.

1.3 DEFINITIONS

- A. Construction Activities: Activities including but not limited to clearing, grubbing, grading, excavation, and dewatering.
- B. Dewatering Wastewater: Wastewater generated from the lowering of the groundwater table, the pumping of accumulated stormwater from an excavation, or the pumping of surface water from a cofferdam, or pumping of other surface water that has been diverted into the Project Site.

- C. Municipal Separate Storm Sewer: Conveyances for stormwater (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) owned or operated by any municipality and discharging directly to surface waters of the state.
- D. Permittee: Any entity that initiates, creates or maintains a discharge in accordance with the Stormwater General Permit. The Owner shall be the Permittee.
- E. Registrant: Any entity that files a Registration. The Owner shall be the Registrant.
- F. Registration: Registration form filed with the CTDEEP pursuant to Section 4 of the Stormwater General Permit.
- G. Retain: To permanently hold on-site with no subsequent point-source release as in a detention system where there is a temporary holding or delaying of the delivery of stormwater downstream.
- H. Sediment: Solid material, either mineral or organic, that is in suspension, is transported, or has been moved from its site of origin by erosion.
- I. Stabilize: The use of pavement, establishment of vegetation, use of geotextile materials, use of organic or inorganic mulching materials, or retention of existing vegetation to prevent erosion.
- J. Stormwater: Waters consisting of precipitation runoff.
- K. Total Disturbance: The total area on a site that will be exposed or susceptible to erosion during the course of a project. "Total sediment load" means the total amount of sediment carried by stormwater runoff on an annualized basis.
- L. Upland Soils: Soils which are not designated as poorly drained, very poorly drained, alluvial, or flood plain by the National Cooperative Soils Survey, as may be amended from time to time, of the Soil Conservation Service of the United States, Department of Agriculture, and/or the Inland Wetlands Commission of the community in which the project will take place.

1.4 QUALITY ASSURANCE

- A. The latest revisions of the following documents shall apply to this Section:
 - 1. State of Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities, (DEP-PED-GP-015 modified October 1, 2013) issued under the authority of Section 22a-430b of the Connecticut General Statutes.
- B. The conditions of the Stormwater General Permit, the SWPCP, and other conditions of approval or authorizations shall become part of the Contract Documents.
- C. Contractor shall take such measures as necessary to understand and comply with provisions of Federal, State, and local regulations and requirements that govern Contractor's operations and stormwater and non-stormwater discharges from the Project Site and areas of disturbance outside the Project Limits during construction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL PERMIT REGISTRATION

- A. Prior to starting work, the Owner shall prepare and file the Stormwater General Permit Registration for such permit including all required supporting documentation and fees.
- B. Contractor shall be responsible for any additional information as required by the CTDEEP deemed necessary to evaluate the consistency of the subject activity with the requirements for authorization under the Stormwater General Permit.
 - 1. Contractor shall retain copies of all documents required by the General Permit, and all records used to complete the registration to be authorized by the Stormwater General Permit, for a period of at least three years from the date that construction at the site is completed, unless the Commissioner specifies another time period in writing.
- C. Penalties
 - 1. Contractor shall be responsible for penalties assessed on Contractor or the Owner as a result of Contractor's failure to comply with the requirements of the Stormwater General Permit or with the applicable provisions of the Federal, State, and local regulations and requirements.
 - 2. Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the Contractor or the Owner, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.
- D. Within five (5) days after the date Contractor becomes aware of a change in any information in any material submitted pursuant to the Stormwater General Permit, or becomes aware that any such information is inaccurate or misleading or that any relevant information has been omitted, Contractor shall notify the Engineer.

3.2 CONSTRUCTION ACTIVITIES

- A. The Contractor shall train all employees and subcontractors per Section 7.0 of the SWPCP.
- B. All employees of the Contractor, and any subcontractor, who participate with the site construction, shall sign the SWPCP certification, per Section 8.0 of the SWPCP.
- C. The Contractor shall inspect the site on a weekly basis and after every rainfall greater than 0.1 inches.
- D. All work shall be conducted in compliance with all conditions of the General Permit and as specified in Section 015713 – Temporary Erosion and Sedimentation Controls.
- E. Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or Contractor's records pertaining to water pollution control work.
- F. Upon learning of a violation of a condition of the Stormwater General Permit, Contractor shall immediately take all reasonable action to determine the cause of such violation, correct

and mitigate the results of such violation, prevent further such violation, and report in writing such violation and such corrective action to CTDEP within five (5) days of the permittee's learning of such violation. Such information shall be filed in accordance with the certification requirements prescribed in Section 6(h) of the Stormwater General Permit.

END OF SECTION

STORMWATER POLLUTION CONTROL PLAN

**Crystal Lake Elementary School
Project No. 048-0058 EA/RR/PS**



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November 2013

TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION.....	1
2.0 SITE PLAN.....	2
3.0 SITE DESCRIPTION.....	3
3.1 Nature of the Construction Activity.....	3
3.2 Site Area and Site Area Disturbance.....	3
3.2 Runoff Coefficients.....	3
3.3 Receiving Water(s).....	3
3.4 Wetlands.....	3
4.0 CONSTRUCTION SEQUENCING.....	4
4.1 Phase 1.....	4
4.2 Phase 2.....	4
4.3 Phase 3.....	4
4.4 General Construction Sequence.....	4
5.0 STORMWATER CONTROL MEASURES.....	6
5.1 Erosion and Sediment Controls.....	6
5.1.1 Soil Stabilization and Inspection.....	6
5.1.1.1 Erosion Control Barriers.....	6
5.1.1.2 Temporary Seeding.....	8
5.1.1.3 Soil Stabilization-Mulches.....	9
5.1.1.4 Soil Stabilization-Blankets/Mats.....	10
5.1.1.5 Temporary Filter Inserts.....	10
5.1.1.6 Stockpile Management.....	11
5.1.2 Structural Measures.....	11
5.1.2.1 Diversion – Temporary Fill Berm.....	12
5.1.2.2 Diversion – Water Bar.....	12
5.1.2.3 Temporary Diversion.....	13
5.1.2.4 Storage – Temporary Sediment Basin.....	13
5.1.2.5 Storage – Temporary Sediment Trap.....	14
5.2 Dewatering.....	15
5.2.1 Dewatering Plan.....	15
5.3 Emergency Flood Procedures.....	16
5.3.1 Weather Monitoring.....	16
5.3.2 Weather Conditions.....	17
5.3.3 Contingency Plans.....	18

5.3.4	Contingency Operations.....	19
5.4	Post Construction Stormwater Management.....	20
5.3.1	Permanent Stabilization Practices.....	21
5.3.2	Maintenance of Permanent Stabilization.....	21
6.0	OTHER POLLUTION CONTROLS.....	23
6.1	Waste Disposal.....	23
6.1.1	Waste Materials.....	23
6.1.2	Recycling.....	23
6.1.3	Liquid Waste Materials.....	23
6.1.4	Hazardous Materials.....	23
6.1.5	Sanitary Waste.....	23
6.2	Washout Areas.....	23
6.3	Off-Site Vehicle Tracking.....	24
6.4	Dust Control.....	26
6.4.1	Water.....	26
6.4.2	Calcium Chloride.....	26
6.4.3	Mulch.....	26
6.5	Spill Prevention.....	26
6.5.1	Potential Stormwater Pollutions Sources.....	26
6.5.2	Potential Stormwater Pollutants.....	27
6.5.3	Good Housekeeping.....	27
6.5.4	Product Specific Practices.....	28
6.5.5	Spill Control Practices.....	28
6.6	Post-Construction Cleaning.....	29
7.0	INSPECTION AND MONITORING.....	30
7.1	Inspection.....	30
7.2	Routing Inspections.....	30
7.1.1	Qualified Inspector.....	30
7.1.2	Rainfall Measurement.....	31
7.1.3	Inspection Criteria.....	31
7.1.4	Inspection Report.....	32
7.1.5	Turbidity Monitoring.....	32
7.1.6	Stormwater Monitoring Reports.....	34
8.0	CONSTRUCTION WORKERS TRAINING.....	35
8.1	Construction Personnel in Responsible Charge.....	35

8.2	Staff Construction Personnel.....	35
9.0	CERTIFICATION.....	36

ATTACHMENTS

Attachment 1	Site Location Map
Attachment 2	Endangered and Threatened Species Map
Attachment 3	Site Plans

APPENDICES

Appendix A	Inspection Reports
Appendix B	Stormwater Monitoring Reports (SMR)
Appendix C	Washout Area Maintenance and Inspection Records
Appendix D	Notice of Termination Form

1.0 INTRODUCTION

The Town of Ellington Board of Education is undertaking the renovation of, and addition to, an existing elementary school, drives, parking, and other site appurtenances located at 284 Sandy Beach Road in Ellington, Connecticut. A Site Location Map is included as Attachment 1. The purpose of this project is to expand the school facility from a K-4 school to a K-6 school, including the required parking, drop-off locations, playing fields and play areas.

This Stormwater Pollution Control Plan (SWPCP) has been prepared in accordance with the Connecticut Department of Energy and Environmental Protection (DEEP) “General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities”, DEEP-WPED-GP-015 (hereinafter the “General Permit”). OPM has filed registration under the General Permit with DEEP and is therefore The Ellington board of Education (BOE). As this SWPCP is a required component of the General Permit registration, all project participants who are involved with “site” construction (e.g. Construction Manager, General Contractor, Contractor, Subcontractors, etc.) are required to certify to this SWPCP and perform the actions defined by this SWPCP throughout all phases of construction. The BOE, as Permittee, will be responsible for compliance with applicable portions of this SWPCP following the completion of construction and turn-over of the new facility.

This SWPCP is intended to be used in concert with technical specification Section 01 5713 – Temporary Erosion and Sedimentation Controls and the Erosion and Sedimentation Control Plans included in Attachment 3. This SWPCP is intended to reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice the following: (1) pollution caused by soil erosion and sedimentation during and after construction; and (2) stormwater pollution caused by use of the site after construction is completed.

2.0 SITE PLAN

This project site consists of property located at 284 Sandy Beach Road in Ellington, Connecticut. The site is bordered by South Road and one (1) residential property to the west, Sandy Beach Road (CT Route 140) to the north, and several residential properties to the east and south. The site is approximately 16.2 acres, and includes an approximately 32,000 square foot, one-story, brick building, two (2) small wood sheds an on-site well pump station and approximately 1.5 acres of inland wetlands.

Site topography is sloping to the Southwest, with the highest elevation along Sandy Beach Road (approximately 688 feet) and the lowest elevation at the western edge of South Road (approximately 652 feet).

The Ellington Natural Diversity Data Base Map has been reviewed on site does not fall within any endangered species. The Endangered and Threatened Species Map is provided as Attachment 2.

Site drawings included in Attachment 3 indicate the following:

- Drainage patterns
- Approximate slopes anticipated after major grading activities
- Areas of soil disturbance
- Location of major structural and non-structural controls
- The location of areas where stabilization practices are expected to occur
- Areas which will be vegetated following construction
- Monitored outfalls

3.0 SITE DESCRIPTION

3.1 Nature of the Construction Activity

Construction will occur within the limits of the site with some additional construction activity extending off of the site for the connection of new utilities to existing infrastructure. Construction activity will generally occur in four major components: 1) demolition and site preparation, 2) initial site construction and building foundation, 3) building construction, and 4) final site construction. In general, construction will include site demolition, removal of hardscape (pavement/sidewalks), excavation and earthmoving, utility installations, building foundation construction, vertical construction (building), site finishes, paving, and planting.

3.2 Site Area and Site Area Disturbance

The proposed building, parking, and school appurtenances will disturb approximately 12 acres of soil over the 16.2-acre site. Soil disturbing activities will consist of the building footprint excavation, playing field earthwork, parking and sidewalk surfaces, the creation of the detention basin, and the shaping of all landscaped areas.

3.2 Runoff Coefficients

The estimated average runoff coefficient of the site after construction activities are completed is 0.45.

3.3 Receiving Water(s)

If not infiltrated into the ground, wastewaters discharged under the General Permit will be directed the existing stormwater system. The site contributes flow to the Ellington Drainage Basin 4501-02 and discharges to the southwest to a brook that ultimately flows to Shenipsit Lake.

3.4 Wetlands

The total wetland acreage on site is approximately 1.5 acres. No wetlands will be disturbed as part of this project.

4.0 CONSTRUCTION SEQUENCING

The sequence of major construction activity will be divided into four construction phases. Crystal Lake Elementary will be open and operating while site work is occurring. See Phasing Plan (700 Series) in Attachment 3 for details. The general scope of these phases are summarized below.

4.1 Phase 1

Estimate Timetable: February 2014 – December 2014.

Phase 1 will consist of the majority of earthwork operations, school site operations (parking, bus drop, parent drop). All construction traffic will be off south road, and construction of sanitary connection & fire pump.

4.2 Phase 2

Estimate Timetable: January 2015 – August 2015.

Phase 2 will consist of very little earthwork. All construction traffic will be off Sandy Beach Road, and site lighting in newly constructed areas will be in place as well as sanitary facilities from Phase 1.

4.3 Phase 3

Estimate Timetable: September 2014- August 2016

Phase 3 will consist of construction of the play equipment.

4.4 General Construction Sequencing

General sequencing will be as follows:

1. The contractor should meet with town staff for pre-construction meeting prior to any activity.
2. Trees to be saved should be protected by tree protection fencing.
3. For trees to be removed, contractor will coordinate with tree warden to ensure proper permits are obtained and posting requirements are met.
4. Install construction entrance(s).
5. Install perimeter erosion and sediment controls and construction fence in accordance with this E&S plan.
6. Cut trees within the defined clearing limits and remove cut wood. Chip brush and stockpile chips for future use or remove off site.
7. Construct temporary sediment traps and diversion swales.
8. Excavate all stumps located in structural or fill areas and remove to an approved disposal site or stockpile area to be chipped. Stumps in non-structural areas may be ground in place or cut flush with the ground level and left in place.
9. Strip all topsoil within the construction and slope limits. Stockpile all topsoil in an approved area and secure with erosion and sediment controls.
10. Cut or fill to establish the sub-grade.
11. Begin addition and renovation to building.
12. Install all drainage facilities starting at the outfall and proceeding upgrade. Install remaining utilities. Ensure that the drainage outlet protection is in place prior to any flow being allowed to discharge.

13. Place, grade, and compact the processed aggregate in parking areas and site drives.
14. Topsoil and grade all slope areas to within two (2) feet of the proposed building/curb/edge of pavement.
15. Apply stabilization measures to remaining disturbed areas in accordance with the E&S plan (topsoil, seeding, sodding, mulching, etc.)
16. Install first course of bituminous concrete.
17. Install curbing, where required.
18. Inspect and clean drainage system, as needed.
19. Install the final course of bituminous concrete pavement.
20. After site is stabilized in accordance with the applicable E&S measures, remove temporary erosion and sediment controls.

5.0 STORMWATER CONTROL MEASURES

Per the General Permit, this SWPCP must address interim and permanent stabilization practices to address pollution caused by soil erosion and sedimentation during construction, and soil erosion and sedimentation following construction. The project's erosion and sedimentation controls and stormwater management systems have been designed to address both short-term and long-term stormwater quality.

The project's Erosion and Sediment Control Plans include many of the measures indicated below. However, the measures specified on the plans are the minimum requirements for erosion and sediment control at the project, and are shown in general size and location only. All contractors performing site work on the project, construction managers who may engage contractors on the project, and other contractor entities who may have authority over erosion and sedimentation control measures at the project are responsible for ensuring that all measures are configured and constructed in a manner that will minimize erosion of soils and prevent the transport of sediments and other pollutants to any resource areas. In general terms, all entities performing work on the site have a responsibility to minimize the area of exposed soil, control run-off rate and direction, and provide for rapid stabilization of exposed areas.

5.1 Erosion and Sediment Controls

During construction, stormwater run-off is a concern due to the excess amount of exposed areas that do not have vegetation or other cover to prevent the removal and transportation of sediment to resource areas. The primary function of erosion and sedimentation controls, as defined by the 2002 "Connecticut Guidelines for Soil Erosion and Sediment Control" (hereinafter the "2002 Guidelines") is to, "absorb erosional energies and reduce run-off velocities that force the detachment and transport of soil and/or encourage the deposition of eroded soil particles before they reach any sensitive area." The project addresses the short-term concerns by providing erosion control measures in the form of Erosion and Sediment Control Plans (refer to Attachment 1). The proposed erosion and sedimentation controls consider the specific characteristics of the site and the anticipated construction activities, and have been designed in accordance with the 2002 Guidelines.

5.1.1 Soil Stabilization and Protection

5.1.1.1 Erosion Control Barriers

Reference: Section 5-11 of the 2002 Guidelines

Prior to any construction activity, hay bales, silt fence, or combination hay bale/silt fence barriers will be placed at the limit of work where run-off potential exists, at other key locations within the site where run-off potential exists, and around stockpiles or stockpile areas. These barriers will be inspected once every seven calendar days and within 24 hours after every rainfall generating a discharge. Repair or replace damage or displaced fencing as required. Collected silt will be removed when one-half the barrier height is reached.

Haybales

Use hay bales for the following:

- To intercept and detain small amounts of sediment from small disturbed areas.
- To decrease the velocity of sheet flows.
- To redirect small volumes of water away from erodible soils.
- To settle and assist in filtering waters discharged from pumping operations.

Applicability-

- Below small disturbed areas where the drainage area (disturbed and undisturbed) is less than 1 acre in size.
- Above disturbed slopes to direct surface water away from erodible areas where the drainage area (disturbed and undisturbed) is less than 1 acre in size.
- Where protection and effectiveness is required for less than 3 months.
- Where sedimentation will reduce the capacity of storm drainage systems or adversely affect adjacent areas, watercourses and other sensitive areas.
- Not for use in drainageways, except in special cases where it is applied with other measures.
- Not intended for use in streams.

Silt Fence

Use silt fence for the following:

- To intercept and retain sediment from disturbed areas.
- To decrease the velocity of sheet flows and low volume concentrated flows.

Applicability-

- Below small disturbed areas where the contributing drainage area (disturbed and undisturbed) is less than 1 acre in size.
- At storm water drainage inlets and catch basins where sedimentation will reduce the capacity of storm drainage systems or adversely affect adjacent areas, watercourses and other sensitive areas.
- Not for use in areas where rock, frozen ground or other hard surface prevents proper installation of the barrier.
- Prohibited from use in drainageways whose flow is supported by ground water discharge.

5.1.1.2 Temporary Seeding

Reference: Section 5-3-2 of the 2002 Guidelines

Areas that will remain disturbed but inactive for at least thirty days will receive temporary seeding or soil protection within seven (7) days in accordance with the 2002 Guidelines. Areas that will remain disturbed beyond the seeding season as identified in the 2002 Guidelines, will receive long-term, non-vegetative stabilization and protection (see below) sufficient to protect the site through the winter. In all cases, stabilization and protection measures shall be implemented as soon as possible in accordance with the 2002 Guidelines or as approved by DEEP.

It is important to note that temporary seeding will not provide the same level of protection that permanent vegetation will provide. Temporary seeding mixtures do not develop a “turf” or “sod.” Temporary seeding does not generally receive the same level of maintenance as permanent seeding.

Temporary seeding will be conducted per the table below:

Temporary Erosion Control Seeding

Species (Note 1)	Application Rate, Pounds Per Acre	Application rate, Pounds Per 1,000 sf	Optimum Seed Depth, inches (Note 2)	Optimum Seeding Dates (Note 3)
Annual ryegrass <i>Lolium multiflorum</i>	40	1.00	0.5	3/1 - 6/15 and 8/1 - 10/15
Perennial ryegrass <i>Lolium perenne</i>	40	1.00	0.5	3/15 - 7/1 and 8/1 - 10/15
Winter Rye <i>Secale cereale</i>	120	3.00	1.00	4/5 - 7/1 and 8/15 - 10/15
Oats <i>Avena sativa</i>	86	2	1	3/1 - 6/15 and 8/1 - 9/15
Winter Wheat <i>Triticum aestivum</i>	120	3	1	4/15 - 7/1 and 8/15 - 10/15
Millet <i>Echinochloa crusgalli</i>	20	.5	1	5/15 - 7/15
Sudangrass <i>Sorghum sudanese</i>	30	.7	1	5/15 - 8/1
Buckwheat <i>Fagopyrum esculentum</i>	15	.4	1	4/1 - 9/15
Weeping lovegrass <i>Eragrostis curvula</i>	5	.2	.25	6/1 - 7/1
ConnDOT All Purpose Mix	150	3.4	.5	3/1 - 6/15 and 8/1 - 10/15

1 - Listed species may be used in combinations to obtain a broader time spectrum. If used in combinations, reduce each species planting rate by 20% of that listed.

2 - Seed at twice the indicated depth for sandy soils

3 - May be planted throughout summer if soil moisture is adequate or can be irrigated. Fall seeding may be extended 15 days in the coastal towns.

5.1.1.3 Soil Stabilization- Mulches

Reference: Section 5-4-8 of the 2002 Guidelines

Structural (non-living) soil stabilization is intended to protect the soil surface on a temporary basis without the intention of promoting plant growth.

Applicability-

- When grading of the disturbed area will be suspended for a period of 30 or more consecutive days, but less than 5 months, disturbed areas will be stabilized within 7 days of the suspension of grading through the use of mulch, non-bituminous tackifiers, erosion control netting, or other approved materials appropriate for use as a temporary soil protector.
- For surfaces that are not to be reworked within 5 months but will be reworked within 1 year, use temporary seeding, seeding-type mulch (hay, straw, or cellulose fiber) or when slopes are less than 3:1, wood chips, bark chips or shredded bark.

Mulch Types-

Hay - The dried stems and leafy parts of plants cut and harvested, such as alfalfa, clovers, other forage legumes and the finer stemmed, leafy grasses. The average stem length should not be less than 4 inches. Hay that can be windblown should be anchored to hold it in place.

Straw - Cut and dried stems of herbaceous plants, such as wheat, barley, cereal rye, or brome. The average stem length should not be less than 4 inches. Straw that can be windblown should be anchored to hold it in place.

Wood Chips - Chipped wood material from logs, stumps, brush or trimmings including bark, stems and leaves having a general maximum size of 0.5 inch by 2 inches and free of excessively fine or long stringy particles as well as stones, soil and other debris. No anchoring is required. If seeding is performed where wood chips have been previously applied, prior to the seeding the wood chips should be removed or tilled into the ground and additional nitrogen applied. Nitrogen application rate is determined by soil test at time of seeding (anticipate 12 lbs. nitrogen per ton of wood chips).

Bark Chips, Shredded Bark - Tree bark shredded as a by-product of timber processing having a general maximum size of 4 inches and free of excessively fine or long stringy particles as well as stone and other debris. Material use is the same as wood chips.

Other Mulch Materials - Other mulch materials may include corn stalks, leaves and other similar materials provided they meet the requirements of the materials in Section 5-4 of the 2002 Guidelines.

5.1.1.4 Soil Stabilization - Blankets/Mats

Reference: Section 5-4-10 of the 2002 Guidelines

Erosion control blankets/mats are a manufactured product composed of biodegradable/photodegradable natural or polymer fibers and/or filaments that have been mechanically, structurally or chemically bound together to form a continuous matrix. Their purpose is to provide temporary surface protection to newly seeded and/or disturbed soils to absorb raindrop impact and to reduce sheet and rill erosion and to enhance the establishment of vegetation.

Applicability-

- On disturbed soils where slopes are 2:1 or flatter.
- Where wind and traffic generated air flow may dislodge standard, unarmored mulches.

The success of temporary erosion control blankets is dependent upon strict adherence to the manufacturer's installation recommendations. As such, a final inspection should be planned to ensure that the lap joints are secure, all edges are properly anchored and all staking/stapling patterns follow the manufacturer's recommendations. Inspect temporary erosion control blankets at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.1 inch or greater for failures. Blanket failure has occurred when (1) soils and/or seed have washed away from beneath the blanket and the soil surface can be expected to continue to erode at an accelerated rate, and/or (2) the blanket has become dislodged from the soil surface or is torn. If washouts or breakouts occur, re-install the blanket after re-grading and re-seeding, ensuring that blanket installation still meets design specifications. When repetitive failures occur at the same location, review conditions and limitations for use and determine if diversions, stone check dams or other measures are needed to reduce failure rate. Repair any dislodged or failed blankets immediately.

5.1.1.5 Temporary Filter Inserts

Temporary Filter Inserts are commercially-available geotextile-fabric filters that are configured to fit into the openings of drainage structures. These filters serve as secondary protective measures to trap (filter) sediment that may bypass other control measures and be carried to drainage structure inlets by stormwater run-off during construction. Temporary Filter Inserts will be installed in catch basins and similar drainage structures as secondary protective measures throughout construction. Temporary Filter Inserts will be placed in each existing catch basin and yard drains prior to the start of construction, and in each new catch basin or yard drain during construction. These devices will be removed upon final site stabilization.

Filter inserts will be inspected once every seven (7) calendar days and within 24 hours after every rainfall of 0.1 inches or greater. Replacement of the inserts will be as often as necessary to maintain function of the drainage structure and prevent excessive ponding due to clogged fabric. Ripped or otherwise damaged inserts will be replaced immediately.

5.1.1.6 Stockpile Management

Reference: Section 4-9 of the 2002 Guidelines

Stockpile management of topsoil and other types of erodible soils is necessary to prevent unnecessary damage resulting from erosion of stockpile material. Locate stockpiles so that natural drainage is not obstructed. Attempt to maximize the distance of stockpiles from wetlands, watercourses, drainage ways, and steep slopes. When the stockpile is downgradient from a long slope, divert run-off water away from or around the stockpile. Install a geotextile silt fence or hay bale barrier around the stockpile area approximately 10 feet from the proposed toe of the slope. The side slopes of stockpiled material that is erodible should be no steeper than 2:1. Stockpiles that are not to be used within 30 days need to be seeded and mulched immediately after formation of the stockpile. The seed mix used depends upon the stockpiled material and the length of time it is to remain stockpiled. Information gathered from soil borings and soil delineation can be used to plan the type of seed and any soil amendments that are appropriate for the stockpile. After the stockpile has been removed, the site should be graded and permanently stabilized.

Topsoil stockpiles which will be idle for at least 30 days will be stabilized with temporary seed and mulch no later than 7 days from the last use. Small stockpiles may be covered with impervious tarps or erosion control matting in lieu of seeding and mulching.

5.1.2 Structural Measures

Structural measures are intended to 1) divert flows away from exposed soils, and 2) store flows or otherwise limit runoff and minimize the discharge of pollutants from the site. Unless otherwise specifically approved in writing by DEEP, or if otherwise authorized by another state or federal permit, structural measures shall be installed on upland soils.

Diversion measures include Temporary Fill Berm, Water Bar, Temporary Diversion and Permanent Diversion. These measures serve the common function of redirecting and controlling the direction of water flow. Diversions are used to direct runoff away from or around sensitive construction areas and to fragment drainage areas to reduce the need for a Temporary Sediment Basin. Diversions are preferable to other types of man-made storm water conveyance systems because they more closely simulate natural flow patterns and characteristics. Flow velocities are generally kept to a minimum.

Storage measures include Temporary Sediment Basin and Temporary Sediment Traps. The primary function of these measures is to slow the velocity of sediment laden waters enough to allow suspended sediments to drop out of solution. They are intended to provide 75% –90% trap efficiency¹ for a 10 year, 2 hour return frequency storm.

Evolving site conditions will determine what structural measures are necessary, and the following general principles should be applied to their selection and placement:

- Prevent clean water from becoming turbid, by diverting runoff from upslope areas away from disturbed areas. Earth dikes, temporary swales, perimeter dike/swales, or diversions that outlet in stable areas can be used in this capacity.
- Remove sediment from turbid water before the water leaves the site. The method of sediment removal depends upon how the water drains from the site.

Concentrated flow must be diverted to a trapping device so that suspended sediment can be deposited. Dikes or swales that outlet into traps or basins can accomplish this. A storm drain system may be used to convey concentrated sediment laden water only if the system empties into a trap or basin. Otherwise, all storm drain inlets must be protected so that sediment laden water cannot enter the drainage system before being treated to remove the sediment.

- Surface runoff draining in sheet flow must be controlled and treated before the water leaves the site. Straw bale dikes, silt fences, or vegetative buffer strips can be used to treat sheet flow.
- All practices designed and implemented must be properly maintained in order to remain functional. Sediment accumulated in basins and traps must be removed and disposed of in a manner that stabilizes them on the construction site.

5.1.2.1 Diversion - Temporary Fill Berm

Reference: Section 5-7-3 of the 2002 Guidelines

The Temporary Fill Berm is a non-engineered measure that is a very temporary berm used at the top of active fill slopes whose drainage area at the point of discharge is less than 3 acres. It is intended to divert run-off from unprotected fill slopes during construction to a stabilized outlet or sediment-trapping facility. Its intended duration of use is less than 5 days for any specific fill berm. The use of a berm starts when it is constructed and ends when new fill is placed. When filling is complete and it is determined that a diversion is needed at the top of fill to protect the fill until it is stabilized then a Temporary Diversion is needed.

Applicability-

- On active earth fill slopes where the drainage area at the top of fill drains toward the exposed slope and where ongoing fill operations make the use of a Permanent Diversion unfeasible.
- Where the intended use is 5 days or less. For use longer than 5 days use Temporary Diversion or other measure.
- Where the drainage area at the point of discharge is less than 3 acres.

5.1.2.2 Diversion - Water Bar

Reference: Section 5-7-6 of the 2002 Guidelines

A Water Bar is a channel with a supporting berm on the down slope side constructed across a construction access road, driveway, or other access way. Its purpose is to minimize the concentration of sheet flow across and down sloping roadways and access ways, or similar sloping and unstable areas and to shorten the continuous flow length within a sloping right-of-way.

Applicability-

- On construction access road, driveway, log road or other access way.
- Where the drainage area to each separate water bar is less than 1 acre.

Unless the water bar discharges into a heavily vegetated area of sufficient length to adequately filter run-off, discharges should be settled or filtered through a geotextile silt fence, hay bale barrier or temporary sediment trap.

5.1.2.3 Temporary Diversion

Reference: Section 5-7-9 of the 2002 Guidelines

Temporary diversion is used to divert sheet flow to a stabilized outlet or a sediment-trapping facility, to direct water originating from undisturbed areas away from areas where construction activities are taking place, and to fragment disturbed areas thereby reducing the velocity and concentration of run-off. When used at the top of a slope, the structure protects exposed slopes by directing run-off away from the disturbed areas. When used at the base of a disturbed slope, the structure protects adjacent and downstream areas by diverting sediment-laden run-off to a sediment trapping facility. Temporary diversions must be installed as a first step in the land-disturbing activity and must be functional prior to disturbing the land they are intended to protect.

Applicability-

- Where the drainage area at the point of discharge is 5 acres or less. For drainage areas greater than 5 acres use Permanent Diversion measure.
- Where the intended use is 1 year or less. For uses greater than 1 year use Permanent Diversion measure.

5.1.2.4 Storage - Temporary Sediment Basin

Reference: Section 5-11-5 of the 2002 Guidelines

Temporary Sediment Basins are formed with a temporary dam, excavated pit or dug pond constructed at a suitable location with a controlled outlet(s) such that a combination of wet and dry storage areas are created. A basin that is created by the construction of a dam is classified as an “Embankment Sediment Basin” and a basin that is constructed by excavation is an Excavated Sediment Basin”. A basin that is created by a combination of dam construction and excavation is classified as an “Embankment Sediment Basin” when the depth of water impounded against the embankment at emergency spillway elevation is three feet or more. If included in the project’s erosion and sedimentation control plans, or required based on evolving site conditions, the sizing and location of Temporary Sediment Basins will be completed in conjunction with the project civil engineer.

Applicability-

- Below disturbed areas with a contributing drainage areas less than 100 acres. For drainage areas less than five acres, a Temporary Sediment Trap may be used.
- Only for locations where failure of the temporary sediment basin will not, within reasonable expectations, result in loss of life or damage to buildings, roads, railroads or utilities.
- Not for use as a post-construction stormwater renovation system.

Maintenance-

Inspect temporary sediment basins at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater to determine conditions in the basin. Clean the sediment basin of sediments when sediment accumulation exceeds one half of the wet storage capacity of the basin or when the depth of available pool is reduced to 18 inches whichever is achieved first. Sediment levels shall be marked within the sediment storage area by stakes or other means showing the threshold elevation for sediment cleanout. Prior to the removal of sediments, dewater the basin through pumping or other means to the expose previously submerged sediments. Use measures found under “Dewatering” herein. Do not allow accumulated sediment to flush into any stream, drainage system, or open or drainageway. Stockpile all sediment in such a manner that it will not erode from the site or into any drainage system, wetland, watercourse, or other sensitive area. Sediment removal, transportation, and disposal shall occur as shown on the plans as limited by the design criteria.

5.1.2.5 Storage - Temporary Sediment Traps

Reference: Section 5-11-25 of the 2002 Guidelines

Temporary Sediment Traps are temporary ponding areas with a stone or engineered outlet formed by excavation and/or construction of an earthen embankment. They are intended to detain sediment-laden run-off from small disturbed areas long enough to allow a majority of the sediment to settle out. If included in the project’s erosion and sedimentation control plans, or required based on evolving site conditions, the sizing and location of Temporary Sediment Traps will be completed in conjunction with the project civil engineer.

Applicability-

- Below disturbed areas where the contributing drainage area is 5 acres or less.
- Where the intended use is 2 years or less.
- When diverting sediment-laden water with temporary diversions that meet the above limitations for use.

Maintenance-

Inspect temporary sediment traps at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.1 inch or greater. Check the outlet to ensure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the stone outlet should maintained at least 1 foot below the crest of the embankment. Also check for sediment accumulation and filtration performance. When sediments have accumulated to one half the minimum required volume of the wet storage, dewater the trap as needed, remove sediments and restore the trap to its original dimensions. Dispose of the sediment removed from the basin in a suitable area and in such a manner that it will not erode and cause sedimentation problems. The temporary sediment trap may be removed after the contributing drainage area is stabilized. If it is to be removed, refer to the project plans for how the site of the temporary sediment trap is to be graded and stabilized after removal.

5.2 Dewatering

Reference: Section 5-13 of the 2002 Guidelines

Dewatering may be utilized at the site to lower the groundwater table to allow for the construction of subsurface improvements (utilities, foundations, etc.) within a relatively dry environment. Several dewatering techniques may be utilized at the contractor's discretion based on the specific nature of the work. These may include:

- Sumps
- Wells
- Wellpoints

Dewatering wastewaters shall be managed in accordance with the 2002 Guidelines. Where feasible and appropriate, dewatering wastewaters will be infiltrated into the ground. Dewatering wastewaters discharged to surface waters will be discharged in a manner that minimizes the discoloration of the receiving waters. No discharge of dewatering wastewater(s) shall contain or cause a visible oil sheen, floating solids, or foaming in the receiving water. Unless otherwise specifically approved in writing by DEEP, or if otherwise authorized by another state or federal permit, dewatering measures shall be installed on upland soils.

The following measures will be employed to ensure that dewatering wastewaters will not cause scouring or erosion or contain suspended solids in amounts that could reasonably be expected to cause pollution:

- Divert surface waters away from areas needing dewatering.
- Consider if well points and sumps can be used to lower the groundwater table, reducing the need for settling facilities.
- For sites that don't require continuous pumping, pump work areas before construction activities begin each work day.
- Provide filtration near the suction intake.
- Locate pumps, intake sumps, and other intake structures in areas which will not require constant moving, when possible.
- Locate pump discharge facilities (portable, permanent, or bio-filtering structures) such that a minimum disturbance of existing wetlands and watercourses is incurred.
- Provide protection at outlets from pumping operations to dissipate pumping surges and prevent erosion at the point of discharge.

5.2.1 Dewatering Plan

This SWPCP provides general measures for the management of dewatering wastewater based on the measures indicated in the 2002 Guidelines. It is recognized that the use of these measures is dependent upon specific site conditions, the contractor's specific method of operations, and the contractor's dewatering equipment. As this plan provides a general description of dewatering operations, the contractor will be required to submit a project-specific Dewatering Plan. This Dewatering Plan will be submitted to the engineer for review and approval prior to its implementation. The project-specific Dewatering Plan will, at a minimum, identify the following:

1. Locations and associated construction where dewatering is required.
2. Specific methods and devices proposed for dewatering.
3. Details on protection at the inlet and outlet of pumps, method for floating the pump intake, or other methods to minimize and retain the sediment.
4. Proposed location of dewatering discharge and details of infiltration basins or other discharge location. Per the General Permit, where feasible and appropriate, dewatering wastewaters will be infiltrated into the ground.
4. Details on any containment berm construction when dewatering earth materials.
5. Identification of a contingency plan for emergency operations should the dewatering operation prove inadequate to meet the dewatering need or is found to be causing unacceptable turbidity problems (e.g., alternative discharge locations or use of a portable sediment tank). If turbidity or siltation problems are not adequately controlled by the contingency plan, then the operation will be ceased and a revised dewatering plan submitted for approval prior to further implementation.

5.3 Emergency Flood Procedures

The site is not located within a mapped FEMA flood zone. However, this SWPCP includes measures that may be taken prior to severe weather events to prevent pollution.

5.3.1 Weather Monitoring

During the construction, monitoring of weather conditions will be conducted by the contractor using locally-available sources. These sources should be consulted on a daily basis to ascertain the latest weather forecast. Examples of sources of weather information are summarized below. This list should not be considered all-inclusive.

- **National Oceanic and Atmospheric Administration, National Weather Service**

Radio: NWR requires a special radio receiver or scanner capable of picking up the signal. Broadcasts are found in the VHF public service band at these seven frequencies (MHz):

162.4000, 162.425, 162.450, 162.475, 162.500, 162.525, 162.550

Television: None

Web Site: <http://weather.gov/>

- **WTNH**

Radio: None

Television: Channel 8 (may vary based on local cable provider)

Web Site: www.wtnh.com

- **WCBS Connecticut**

Radio: WTIC AM 1080

Television: None

Web Site: <http://connecticut.cbslocal.com/>

- **WFSB Eyewitness News**

Radio: None

Television: Channel 3 (may vary based on local cable provider)

Web Site: www.wsfb.com

- **Fox Connecticut**

Radio: None

Television: Channel 9 (may vary based on local cable provider)

Web Site: <http://www.ctnow.com/>

- **NBC Connecticut**

Radio: None

Television: Channel 4 (may vary based on local cable provider)

Web Site: www.nbcconnecticut.com

5.3.2 Weather Conditions

The National Weather Service uses "Watches" and "Warnings" to provide alerts to potentially dangerous weather.

Weather Watches - A "Watch" means conditions are right for dangerous weather. If a "Watch" is issued, all parties should be alert to evolving weather conditions and be prepared to act.

- For events that come and go quickly, such as severe thunderstorms, tornadoes or flash floods, a watch means that the odds are good for the dangerous weather, but it's not yet happening.
- For longer-lived events, such as hurricanes or winter storms, a watch means that the storm isn't an immediate threat, but is anticipated.

When a severe thunderstorm, tornado, or flash flood watch is in effect, all parties should monitor available weather sources and "watch the sky" for signs of dangerous weather. Severe thunderstorms, tornados, and flash floods often can happen so quickly that warnings cannot be issued in time. If these types of watches are issued, project team notifications should be made, construction operations immediately suspended, and flood protection measures implemented.

Hurricane or winter storm watches are longer term. If these types of watches are issued, project team notifications should be made, plans should be made to suspend construction operations based on the timing of the weather event, and applicable flood protection measures implemented.

Weather Warnings - A "Warning" means that the dangerous weather is threatening the area. If a "Warning" is issued, all parties should immediately take action to 1) ensure personnel safety, and 2) take immediate and appropriate actions in response to the weather event. For severe thunderstorms, tornadoes and flash floods, a "Warning" means the event is occurring.

Before “Watches” and “Warnings” are issued, the National Weather Service, private forecasters, newspapers, radio and television normally try to alert the public to potential weather dangers. Often, forecasters begin issuing bulletins on hurricanes and winter storms three or four days before the storm is predicted to occur. It should be noted that forecasters cannot issue alerts for the danger of severe thunderstorms, tornadoes and flash floods with significant advance notice.

5.3.3 Contingency Phases

The contractor, in concert with the permittee and engineer will determine which project team members are responsible for each function during each phase. As tasking is assigned, additional responsibilities, teams, and task lists will be created by the contractor to address specific functions during a specific phase.

Preparation Phase

- In response to a potential flood or associated severe weather event, review all erosion and sedimentation control measures and determine if existing measures require reinforcement and/or if additional temporary measures are required.
- In response to a potential flood or associated severe weather event, structures, materials, and equipment will be reviewed for their potential to cause pollution.
- In response to a potential flood or associated severe weather event, take appropriate actions to ensure that all structures, materials, and equipment will be anchored or restrained to prevent displacement or flotation.
- Provide notifications to permittee, owner, engineer, and other project participants at the outset and completion of this phase.

Response Phase

- To establish an immediate and controlled presence at the project site. The contractor maintains primary responsibility for response actions.
- To conduct a preliminary assessment of flood incident impact, extent of damage, and disruption to construction operations.
- To evaluate and communicate information regarding other responses, clean-up, and when construction operations can resume.
- To provide contractor personnel, owner, engineer, and other applicable project participants with the facts necessary to make informed decisions regarding subsequent resumption and recovery activity.
- Provide notifications to permittee, owner, engineer, and other project participants at the outset and completion of this phase.

Resumption Phase

- To establish and organize contractor forces for the resumption of construction operations.
- To mobilize and activate contractor support teams necessary to facilitate and support the resumption process.
- To notify and appraise owner and engineer of the situation.

Recovery/Restoration Phase

- To prepare and implement recovery operations.

- Re-establish erosion and sedimentation controls.
- Re-establishment site controls (fencing, etc).
- Re-mobilize personnel.
- Re-mobilize materials and equipment
- Perform construction operations required to restore project conditions and continue with construction activities.
- Provide notifications in accordance with Section 2.1 at the outset and completion of this phase.

5.3.4 Contingency Operations

Erosion and Sedimentation Controls

Erosion and sedimentation controls will be present at the project site until final stabilization is achieved.

Procedure – If heavy rains are forecast or in the event of a Weather Watch, Weather Warning, or flood warning, all sedimentation and erosion control measures will be inspected. Based on the inspection coupled with the nature of the forecasted weather event, existing measures will be reinforced and/or additional temporary erosion and sedimentation control measures will be deployed to control erosion and sediment transport.

Structures

Structures at the project site will consist of temporary-type structures such as field trailers, portable storage units, and portable toilets. No permanent structures (e.g. buildings or similar construction) are presently located at the project site.

Procedure - In the event of a flood warning, field trailers, portable storage units, and portable toilets may be removed from project site.

Materials

Various materials will be stored at the project site and utilized during the project. These materials are generally categorized into four categories:

- Natural Materials such as earth fill, gravel, topsoil, trees/shrubs, straw mulch, wood chip mulch.
- Non-Polluting Construction Materials such as silt fencing, plastic or metal temporary construction fencing, lumber, trench boxes, concrete or plastic drainage materials.
- Potentially-Polluting Materials such as fuels, lubricants, cleaning solvents, hydraulic oil, antifreeze/coolant, and fertilizers. These materials pose the greatest threat of causing pollution during a flood event, primarily because they will dissolve and/or disperse quickly in flood waters. During the construction project, only minimal amounts of these types of these materials will be stored within the flood zone, all materials will be stored in a neat, orderly manner in appropriate sealed containers with proper labeling.
- Floatable Materials such as lumber, sealed containers, portable storage units, portable toilets, trash and trash containers, and other buoyant items.

Procedure - In the event of a flood warning, the following procedures will be implemented:

- Natural Materials - Stockpiles of earth materials can remain in-place and should be protected against erosion in accordance with the “2002 Connecticut Guidelines for Soil Erosion and Sediment Control”. If possible natural materials such as shrubs or smaller plantings will be removed from the project site. Larger plantings such a tress should be secured together with rope.
- Non-Polluting Construction Materials - If possible, Non-Polluting Construction Materials will be removed from the project site. If these materials cannot be relocated or removed, they should be consolidated to the extent possible and reviewed item-by-item for materials which have the potential to float. If a material is identified that may float, comply with the procedure for Floatable Materials.
- Potentially-Polluting Materials - All Potentially-Polluting Materials will be removed from the project site.
- Floatable Materials - All Floatable Materials will be removed from the project site. If larger stockpiles of items such as wood chip mulch cannot be relocated, the stockpile will be completely covered with plastic sheeting and secured with sandbags.

Equipment

Equipment at the project site will consist of heavy equipment (excavators, dozers, loaders, trucks, etc.) and small equipment (pumps, generators, plate compactors, etc.). In the event of a flood, the primary concern with this equipment is the potential release of fuels, hydraulics oils, and lubricants associated with the various mechanical components.

Procedure - In the event of a flood warning, equipment will be 1) removed from the project site, or 2) staged in an appropriate location and secured.

5.4 Post Construction Stormwater Management

The objective of the stormwater management system designed for the Crystal Lake Elementary School development is to capture and convey stormwater away from the building and off site travel ways, use engineered facilities to detain, infiltrate, and manage stormwater run-off to control peak flows and reduce contaminate loading to provide long-term protection of the downstream receptors (Ellington Drainage Basin 4501-02). The existing school site constitutes greater than 40 percent impervious cover and will require the retention of one-half the Water Quality Volume (WQV) on site. However, the drainage basins proposed for the final build-out not only provide peak-flow mitigation for the site, but are sized to accommodate the entire WQV as well.

Surficial Stormwater Runoff

Surficial Runoff from the building footprint and surrounding developed areas will be collected in a series of drainage structures and conveyed, via underground piping, to a proposed detention basin located on the western portion of the site, adjacent South Road. The detention basin will be equipped with two (2) outlet control structures that are hard-

piped into the existing South Street drainage facilities. The detention basin will be designed to mitigate peak flow up to the 100-year design storm, as required by the Town.

Roof Drainage

Roof drainage will be collected in a series of roof leaders around the perimeter of the building that connect to three (3) new manholes on its southeastern side, and two (2) in the courtyard. These manholes will discharge to a proposed 12-inch HDPE drainage line. Flows from these locations discharge to the common manhole (DMH 2-2) located south of Crystal Lake Elementary School.

5.3.1 Permanent Stabilization Practices

Permanent site stabilization practices are included on the drawings in Attachment 1 and include the following:

- Grass - Portions of the site such as playing fields, play areas, islands, borders, and miscellaneous areas will be seeded as turf areas. Turf will provide a stabilized surface, but will allow for direct infiltration of stormwater.
- Landscaping/Planted Areas - Several areas of the site will be landscaped and planted. Landscaping, which includes a variety of plantings in mulched beds, is predominantly included in areas proximal to the building. Both landscaped and planted areas will provide a stabilized surface, as well as allow for direct infiltration of stormwater.
- Hardscape - Hardscape on the site will include bituminous pavement drives and parking, concrete walkways, concrete stairs and pavers. Stormwater from these areas will either 1) run-off to an adjacent pervious surface (e.g. grass or landscaping), or 2) run-off to a collection point such as catch basin or drain, and be conveyed to the site stormwater system. Once in the system stormwater will flow to the detention basin.
- Building Structure - The building structure is considered an impervious, stable surface for the purposes of stormwater management. The majority of the roof flow is collected via roof leaders and discharged to a detention basin.

5.3.2 Maintenance of Permanent Stabilization

After construction is completed and accepted by the Town, inspection and maintenance of stabilized surfaces will be the responsibility of the Town.

- Grass, Landscape, and Planted Areas: Inspect semi-annually for erosion or dying vegetation. Repair and stabilize any bare or eroded areas and replace vegetation as soon as possible.
- Access Drive and Site Cleanup: Inspect on a regular basis not to exceed weekly for litter and debris. Sweep at least twice a year, with the first occurring as soon as possible after snowmelt and the second not less than 90 days following the first.
- Catch Basin Sumps: Inspect semi-annually and cleaned when the sump is one half full of silt and/or debris.

- Detention Basins:

- Inspect for invasive vegetation semi-annually.
- Inspect for damage, signs of hydrocarbon buildup, sediment accumulation annually and clean if needed.
- Annually inspect the outlet device to ensure it is free of debris and operational.
- Repair undercut or eroded areas as needed.
- Maintenance shall be performed outside of vegetative growing and wildlife seasons.
- Remove sediment from the basin when the volume of the basin has been significantly reduced or when significant algal growth is observed. (Recommended every 10 years)

6.0 OTHER POLLUTION CONTROLS

6.1 Waste Disposal

6.1.1 Waste Materials - All waste materials generated at the site will be collected and stored in securely lidded, metal dumpsters rented from a licensed solid waste management company. All trash and construction debris from the site will be deposited in the dumpsters. When at capacity, the dumpsters will be removed from the site and transported to a state-licensed waste transfer or waste disposal facility. No construction waste materials will be burned, buried, or otherwise disposed-of on-site.

All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted in the office trailer and a competent person will be assigned day-to-day operation responsibilities.

6.1.2 Recycling – Waste materials generated at the site that are designated for recycling will be collected and stored in securely lidded, metal dumpsters rented from a licensed solid waste management company. Materials designated for recycling will be deposited in the appropriate dumpster based on material type. When at capacity, the dumpsters will be removed from the site and transported to a state-licensed transfer or recycling facility.

6.1.3 Liquid Waste Materials - The dumping of liquid wastes in storm sewers is prohibited. All liquid waste materials generated at the site will be collected and stored in secure containers suitable for the particular type of waste if such liquid waste is not suitable for the “Washout Area” (see below). Containers storing liquid waste will be removed from the site for disposal by a state-licensed company.

6.1.4 Hazardous Materials - All waste materials that are considered “hazardous” such as oils, greases, oil-based paints, solvents, etc. generated by construction will be stored and disposed of in accordance with local, state, and federal regulations. Site personnel must be instructed in the practices of handling, collecting and storage of hazardous materials, and a competent person will be assigned responsibility for seeing that these practices are followed.

6.1.5 Sanitary Waste - All sanitary waste will be collected from portable units on a regular basis as required by applicable regulations.

6.2 Washout Areas

A designated “Washout Area” will be established for the purpose of washing the following:

- Latex paint equipment
- Vehicles, containers, and equipment for concrete
- Applicators and containers for materials which have not contained any oils, greases, oil-based paints, solvents, fuels, lubricants, etc.

The Washout Area shall be established as follows:

- (1) Outside of any buffers and at least 50 feet from any stream, wetland or other sensitive resource; or
- (2) In an entirely self-contained washout system.

The Washout Area shall be clearly delineated with fencing, flagging, or similar highly-visible materials. Washout activities are only permitted within the Washout Area. All wash water shall be directed into a container or pit designed such that no overflows can occur during rainfall or after snowmelt. There shall be no surface discharge of washout wastewaters from the Washout Area.

Hardened concrete waste from the Washout Area will be removed and disposed-of consistent with practices developed for the "Waste Materials" above. At least once per week, any containers or pits used for washout will be inspected to ensure structural integrity, adequate holding capacity, and to check for leaks or overflows. If there are signs of leaks, holes or overflows in the containers or pits that could lead to a discharge, the containers will be repaired prior to further use. For concrete washout areas, all hardened concrete waste will be removed whenever the hardened concrete has accumulated to a height of one-half (1/2) of the container or pit or as necessary to avoid overflows. A record of maintenance and inspections for the Washout Area is included in Appendix C.

6.3 Off-Site Vehicle Tracking

Reference: Section 5-12 of the 2002 Guidelines

Stabilized construction entrances (ant-tracking pad) will be used to help reduce the movement of sediments from the site to off-site areas by vehicles. Construction details for these facilities are contained on the project's Erosion and Sedimentation Control Plans. A stabilized construction entrance will be installed at each primary site access point used by construction equipment.

Stabilized construction entrances will be maintained in a condition which will prevent tracking and washing of sediment onto paved surfaces. Each entrance will be periodically top-dressed with additional stone and/or additional length added as conditions demand.

All sediment spilled, dropped, washed or tracked onto paved surfaces will be immediately removed. Roads adjacent to the site will be left clean at the end of each day. It is also recognized that the use of stabilized construction entrances may not eliminate the need for periodic street sweeping. Therefore, adjacent paved roadways will be swept as necessary.

If the construction entrance is being properly maintained and the action of a vehicle traveling over the stone pad is not sufficient to remove the majority of the sediment, then either (1) the construction entrance will be lengthened, (2) the construction access road surface will be modified, or (3) washing racks (or similar devices) will be installed before the vehicle enters a paved surface. If a washing rack or similar device is to be used to wash sediment from tires, provisions will be employed to intercept the wash water and trap the sediment before it is carried off-site. Per the 2002 Guidelines, the sediment trapping facility will be sized to hold the maximum volume of water that would be used over a 2-hour period.

6.4 Dust Control

The generation of fugitive dust will be minimized during all aspects of the work, and measures to suppress fugitive dust will be employed when work activities are conducted which could generate dust. Construction sequencing will be organized and conducted to the extent possible to leave existing pavement or ground coverings in place until just prior to earth excavation for the purpose of minimizing the migration of dust beyond the project limits into the surrounding area. If the amount of fugitive dust and/or particulate generated during the work is deemed unacceptable or exceeds baseline project site conditions the work will be halted and corrective measures implemented. Dust control and suppression will be implemented as follows:

6.4.1 Water

Water will be applied only at the locations, at such times, and in the amount required to control and suppress dust. The volume of water sprayed for controlling dust shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain or cause a visible oil sheen, floating solids, visible discoloration, or foaming in the receiving stream.

6.4.2 Calcium Chloride

Calcium chloride will be applied only at the locations, times, and in the amount approved by the owner (as Permittee). The application of calcium chloride will be by means of a mechanical spreader, or other approved methods.

6.4.3 Mulch

The use of mulch for dust control will be coordinated with erosion and sedimentation control measures. Straw mulch will be applied at a rate of 100 pounds per 1,000 square feet (100 lb/1,000 ft²). Wood chips or wood mulch will be applied at such a rate as to form a layer one (1) inch thick.

6.5 Spill Prevention

6.5.1 Potential Stormwater Pollution Sources

During construction, the following are potential sources of pollutants that could impact stormwater:

- Cleared and disturbed grassed/planted areas;
- Pavement and utility removal;
- Construction site entrances and bituminous access drive lot construction;
- Foundation excavation and building construction.
- Topsoil and mulch installation;
- Dewatering operations;
- Final grading and landscaping.

6.5.2 Potential Stormwater Pollutants

The materials and substances in the following list are potential stormwater pollutants that are likely to be present during construction.

- Concrete
- Detergents
- Paints (enamel and latex)
- Wood Preservatives
- Pesticides
- Plaster
- Fertilizers
- Petroleum Based Products
- Cleaning Solvents
- Asphalt
- Glue, Adhesives
- Curing Compounds
- Hydraulic Oil / Fluids
- Gasoline
- Diesel Fuel
- Kerosene
- Antifreeze / Coolant

6.5.3 Good Housekeeping

The following good housekeeping practices will be followed on-site during the project:

- An effort will be made to store only enough products required to perform the work.
- All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container and opening a new container.
- Manufacturers' recommendations for proper use and disposal will be followed.
- The Construction Manager and/or site superintendent will inspect daily to ensure proper use and disposal of materials on-site.
- Dumpsters will be kept covered and drain plugs will remain in place unless being cleaned.
- Products will be kept in original containers unless they are not re-sealable. Leftover product will be properly disposed of or placed in a sealable container.
- Original labels and material safety data will be retained as they contain important product information.

- If surplus product must be disposed of, manufacturers' or local and State recommended methods for proper disposal will be followed.

6.5.4 Product Specific Practices

The following product specific practices will be followed on-site:

- Chemical and Petroleum Product Storage - All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) will be stored in tightly sealed containers that are clearly labeled. All chemical and petroleum product containers will be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers will be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy this requirement.
- Petroleum Products - All on-site construction vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Any asphalt substances used on-site will be applied according to the manufacturer's recommendations. Spill kits will be included with any fueling sources and maintenance activities.
- Fertilizers - Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. Fertilizer will not be stored on site.
- Paints - All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system, but will be properly disposed of according to manufacturers' instructions or State and local regulations. Spray guns will be cleaned on a removable tarp.

6.5.5 Spill Control Practices

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information.
- Materials and equipment necessary for spill cleanup will be kept in the designated material storage areas on-site. Equipment and materials will include, but not be limited to, brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, Speedi-Dry and plastic and metal trash containers specifically made for this purpose.

- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous materials will be reported to the appropriate State and/or local government agency, regardless of the size. The National Response Center number is 800-424-8802. The CT DEEP Emergency Reporting number is 800-424-3333.
- The site construction superintendent will be responsible for the day-to-day operations, and act as the person responsible for spill prevention and cleanup. The names of responsible construction spill containment and cleanup personnel will be posted in the material storage area and in the office trailer on-site.

6.6 Post-Construction Cleaning

All post-construction stormwater structures will be cleaned of construction sediment and any remaining silt fence shall be removed upon stabilization of the site, prior to filing notice of termination.

7.0 INSPECTION AND MONITORING

Throughout all phases of construction, the erosion control measures will be routinely inspected, cleaned, repaired, and replaced as necessary. Maintenance of erosion and sedimentation control measures is critical to their effectiveness. Maintenance will be an ongoing process during the period of construction and will continue until long-term vegetation is established. Mulching and seeding will be inspected throughout all phases of construction: at the end of each workday, if precipitation is forecast and after each rainfall. At the end of each workweek, prior to weekends, all erosion and sediment control measures will be inspected and repairs/replacements made as required.

Throughout the construction process, extra stocks of hay bales and filter fabric will be kept on-site to replace those that may become damaged and/or deteriorated.

Any erosion and sediment control measures, which upon inspection, are found to be damaged, deteriorated, or not functioning properly, will be repaired, replaced and corrected immediately after inspection.

Inspection procedures will be addressed and implemented in the following manner:

7.1 Plan Implementation Inspections

Within the first 30 days following commencement of construction activity on the site, a representative of the Permittee will inspect the site. The Permittee's representative for Plan Implementation Inspections is:

BSC Group
180 Glastonbury Boulevard, Suite 103
Glastonbury, CT 06033

The Permittee's representative will inspect the site at least once and no more than three times during the first 90 days of commencement of the construction activity to confirm compliance with the General Permit and proper initial implementation of all control measures designated in this SWPCP for the site for the initial phase of construction.

7.2 Routine Inspections

The Permittee will routinely inspect the site for compliance with the General Permit and this SWPCP for the site until a Notice of Termination has been submitted. Inspection procedures for these Routine Inspections will be addressed and implemented in the following manner.

7.1.1 Qualified Inspector

The Permittee will retain a Qualified Inspector meeting the following definition:

“an individual possessing either (1) a professional license or certification by a professional organization recognized by the commissioner related to agronomy, civil engineering, landscape architecture, soil science, and two years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (2) five years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and

commercial construction projects in accordance with the Guidelines; or (3) certification by the Connecticut Department of Transportation (DOT)”.

The Permittee’s Qualified Inspector will be an individual(s) from:

BSC Group
180 Glastonbury Boulevard, Suite 103
Glastonbury, CT 06033

7.1.2 Rainfall Measurement

The Permittee will maintain a rain gauge on-site to document rainfall amounts.

7.1.3 Inspection Criteria

At least once a week and within 24 hours of the end of a storm that generates a discharge, the Qualified Inspector, will inspect, at a minimum, the following:

- Disturbed areas of the construction activity that have not been finally stabilized.
- All erosion and sedimentation control measures.
- All structural control measures.
- Soil stockpile areas.
- Washout Areas.
- Locations where vehicles enter or exit the site.

For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection will occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, inspections will be conducted at least once every month for three months.

The areas noted above will be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site will also be inspected for evidence of off-site sediment tracking. Where sites have been temporarily or finally stabilized, such inspection will be conducted at least once every month for three months.

The Qualified Inspector will evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharge(s).

7.1.4 Inspection Report

Following each inspection, the Qualified Inspector will prepare a report that will summarize the following:

- The scope of the inspection.
- Name(s) and qualifications of personnel making the inspection.
- The date(s) of the inspection.
- Weather conditions including precipitation information.
- Major observations relating to erosion and sediment controls and the implementation of the SWPCP.
- A description of the stormwater discharge(s) from the site.
- Any water quality monitoring performed during the inspection.

Report forms are included in Appendix A. The report will be signed by the Permittee or his authorized representative. Reports will be retained as part of the SWPCP.

The report will include a statement that, in the judgment of the Qualified Inspector(s) conducting the Routine Inspection, the site is either in compliance or out of compliance with the terms and conditions of this SWPCP and General Permit. If the site inspection indicates that the site is out of compliance, the inspection report will include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the 2002 Guidelines) will be implemented on site within 24 hours and incorporated into a revised SWPCP within three (3) calendar days of the date of inspection unless another schedule is specified in the 2002 Guidelines. Engineered corrective actions (as identified in the 2002 Guidelines) shall be implemented on site within seven (7) days and incorporated into a revised SWPCP within ten (10) days of the date of inspection, unless another schedule is specified in the 2002 Guidelines or is approved by DEEP. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures will be implemented to minimize the potential for the discharge of pollutants from the site.

Inspectors from DEEP may inspect the site for compliance with the General Permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures.

7.1.5 Turbidity Monitoring

The Permittee via the Qualified Inspector, will perform turbidity monitoring in accordance with the following:

Monitoring Frequency

- Sampling will be conducted at least once every month, when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

- The Permittee will collect samples during normal working hours, which for this project are Monday through Friday, between the hours of 7:00 am and 5:00 pm.
- If sampling is discontinued due to the end of normal working hours, the Permittee will resume sampling the following morning or the morning of the next working day following a weekend or holiday, as long as the discharge continues.
- Sampling may be temporarily suspended any time conditions exist that may reasonably pose a threat to the safety of the person taking the sample. Such conditions may include high winds, lightning, impinging wave or tidal activity, intense rainfall or other hazardous condition. Once the unsafe condition is no longer present, sampling will resume.
- If there is no stormwater discharge during a month, sampling will not be conducted.

Sample Collection

- All samples will be collected from discharges resulting from a storm event that occurs at least 24 hours after any previous storm event generating a stormwater discharge.
- Any sample containing snow or ice melt must be identified on the Stormwater Monitoring Report form. Sampling of snow or ice melt in the absence of a storm event is not a valid sample.
- Samples shall be grab samples taken at least three separate times during a storm event and shall be representative of the flow and characteristics of the discharge(s). Samples may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings (i.e. not composite). The first sample shall be taken within the first hour of stormwater discharge from the site. In cases where samples are collected manually and the discharge begins outside of normal working hours, the first sample shall be taken at the start of normal working hours.

Sampling Locations

- Sampling is required of all point source discharges of stormwater from disturbed areas.
- Where there are two or more discharge points that discharge substantially identical runoff, based on similarities of the exposed soils, slope, and type of stormwater controls used, a sample may be taken from just one of the discharge points. In such case, the Permittee will report that the results also apply to the substantially identical discharge point(s).
- No more than 5 substantially identical outfalls may be identified for one representative discharge. If such project is planned to continue for more than one year, the permittee shall rotate twice per year the location where samples are taken so that a different discharge point is sampled every six months.
- The outfalls authorized by the General Permit are identified on the Erosion and Sedimentation Control Plans.

Sampling and Analysis

Sampling and turbidity analysis will be conducted in accordance with ASTM D6855. Results will be reported in Nephelometric Turbidity Units (NTU).

Turbidity Values

The stormwater discharge turbidity value for each sampling point will be determined by taking the average of the turbidity values of all samples taken at that sampling point during a given storm.

7.1.6 Stormwater Monitoring Reports

Within thirty (30) days following the end of each month, the Permittee will submit the stormwater sampling result(s) on the Stormwater Monitoring Report (SMR) form included in Appendix B. If there was no discharge during any given monitoring period, the Permittee will submit the form as required with the words “no discharge” entered in place of the monitoring results. If the Permittee monitors any discharge more frequently than required by the General Permit, the results of this monitoring will be included in additional SMRs for the month in which the samples were collected.

8.0 CONSTRUCTION WORKER TRAINING

A construction employee training program will be developed and implemented by the Construction Manager, General Contractor, or site Contractor, as applicable, to educate project personnel about the requirements of the erosion and sedimentation control specifications and this SWPCP.

8.1 Construction Personnel in Responsible Charge

Training for construction personnel in responsible charge (project managers, supervisors, superintendents, etc.) will be given training to include the following:

- Goals of erosion and sedimentation control.
- The erosion and sedimentation process.
- Review of the General Permit.
- Review of erosion and sedimentation control plans, technical specifications, and this SWPCP.
- Review of erosion control methods and materials.
- Review of spill prevention and response, good housekeeping, and proper material handling
- Review of waste handling and washout
- Inspections and monitoring.

Construction personnel in responsible charge will be given the training prior to, or on, their first day on the project.

8.2 Staff Construction Personnel

Training for staff construction Personnel will be given training to include the following:

- Goals of erosion and sedimentation control.
- Review of erosion and sedimentation control plans, technical specifications, and this SWPCP.
- Review of erosion control methods and materials.
- Review of waste handling and washout.
- Review of reporting procedures for alerting personnel in responsible charge to erosion and sedimentation control problems.

Construction personnel will be given the training prior to, or on, their first day on the project.

9.0 CERTIFICATION

The following Certification Statement applies to this SWPCP. All project participants who are involved with “site” construction (e.g. Construction Manager, General Contractor, Contractor, Subcontractors, etc.) are required to certify to this plan by signing in the space provided. By signing, each project participant certifies the following:

“I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this general permit, and must comply with the terms and conditions of this general permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for the site.”

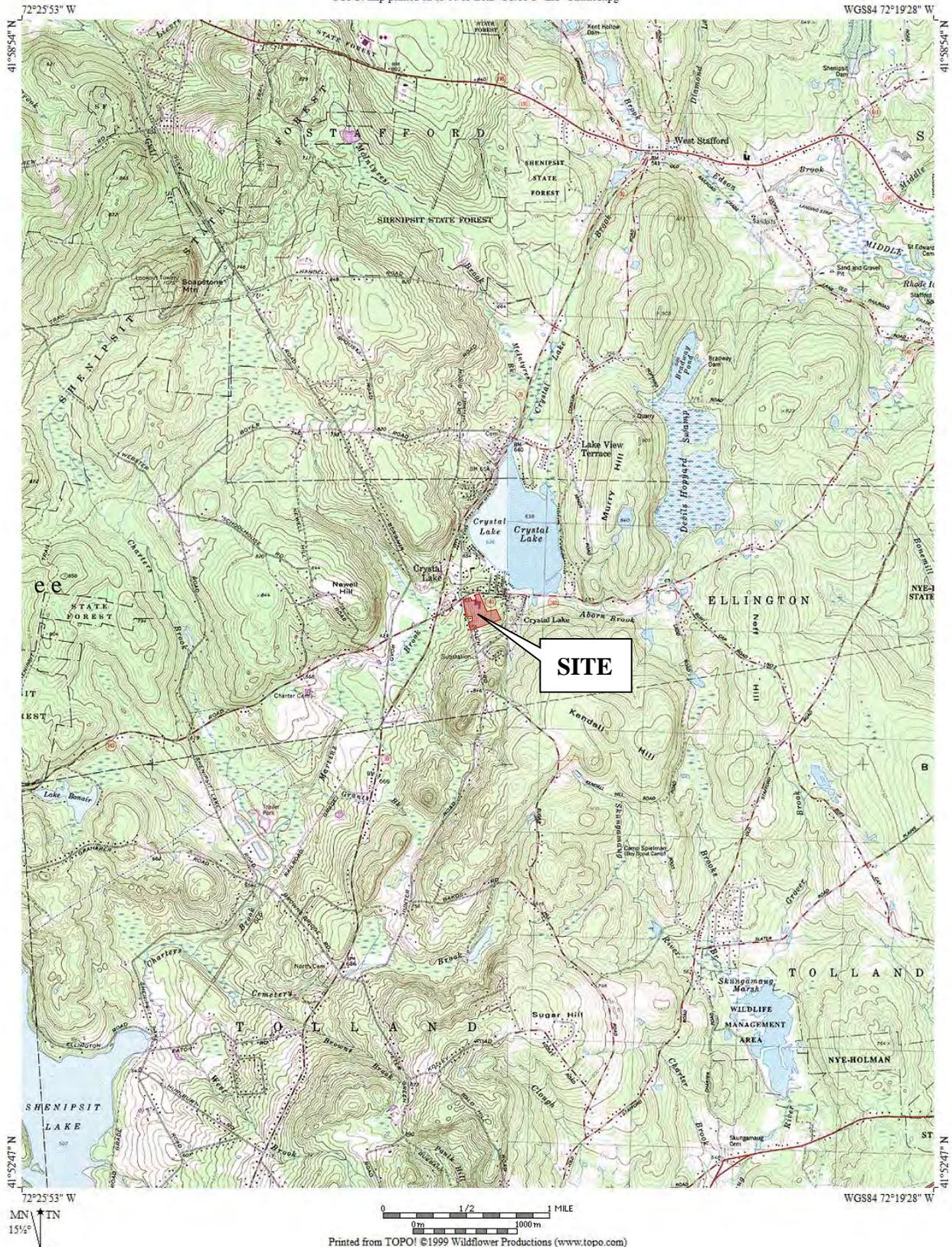
1	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>_____</p> <p>Responsible for (project role):</p> <p>_____</p>
2	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>_____</p> <p>Responsible for (project role):</p> <p>_____</p>
3	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>_____</p> <p>Responsible for (project role):</p> <p>_____</p>

4	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>Responsible for (project role):</p>
5	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>Responsible for (project role):</p>
6	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>Responsible for (project role):</p>
7	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>Responsible for (project role):</p>
8	<p>_____</p> <p>Signature</p> <p>_____</p> <p>Printed Name</p> <p>_____</p> <p>Date</p>	<p>On behalf of (company):</p> <p>_____</p> <p>Telephone Number:</p> <p>Responsible for (project role):</p>

Attachment 1
Site Location Map

Attachement 1 – Site Location Map
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut
Scale = 1:24,000

TOPOI map printed on 03/06/13 from "CT.TPO" and "Untitled.tpg"



Attachment 2
Endangered and Threatened Species Map

NATURAL DIVERSITY DATA BASE AREAS

ELLINGTON, CONNECTICUT

LEGEND

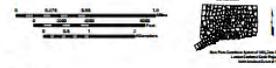
- State and Federal Listed Species and Significant Natural Communities
- Railroad
- Highway
- US Route
- State Route
- Ramp
- Street
- State Boundary
- County Boundary
- Town Boundary
- Watercourse
- Intermittent Watercourse
- Dam
- Dredged Channel
- Aqueduct
- Open Water
- Intermittent Water
- Marsh area on USGS topo map
- Cranberry Bog
- Dam
- Fish Hatchery
- Aqueduct
- Sewage Pond
- Water Tank

EXPLANATION

This map shows present locations of state and federal listed species and significant natural communities. The map is based on the most current information available and is subject to change. For more information about State Listed Species, contact the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources, 1000 Capitol Mall, Hartford, CT 06103. For more information about State Listed Species, contact the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources, 1000 Capitol Mall, Hartford, CT 06103.

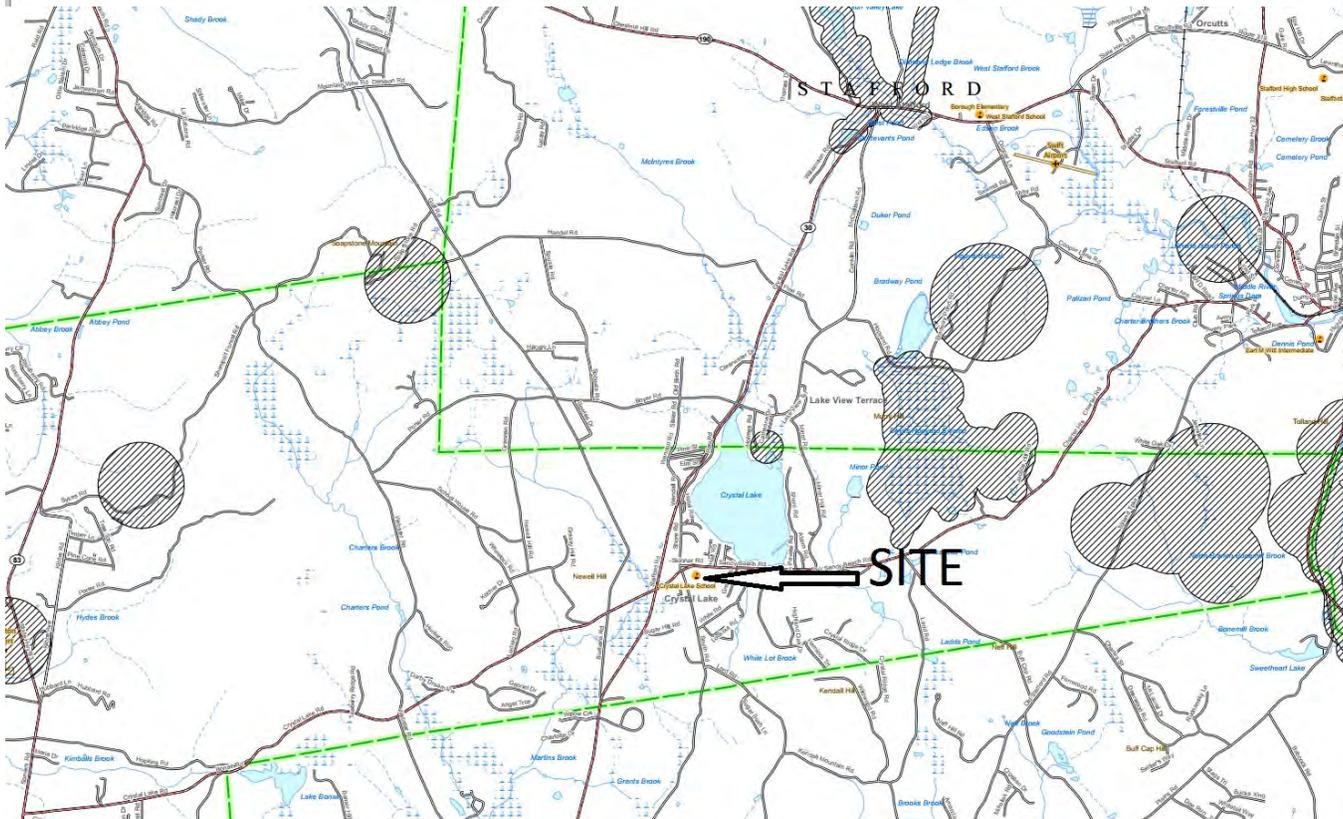
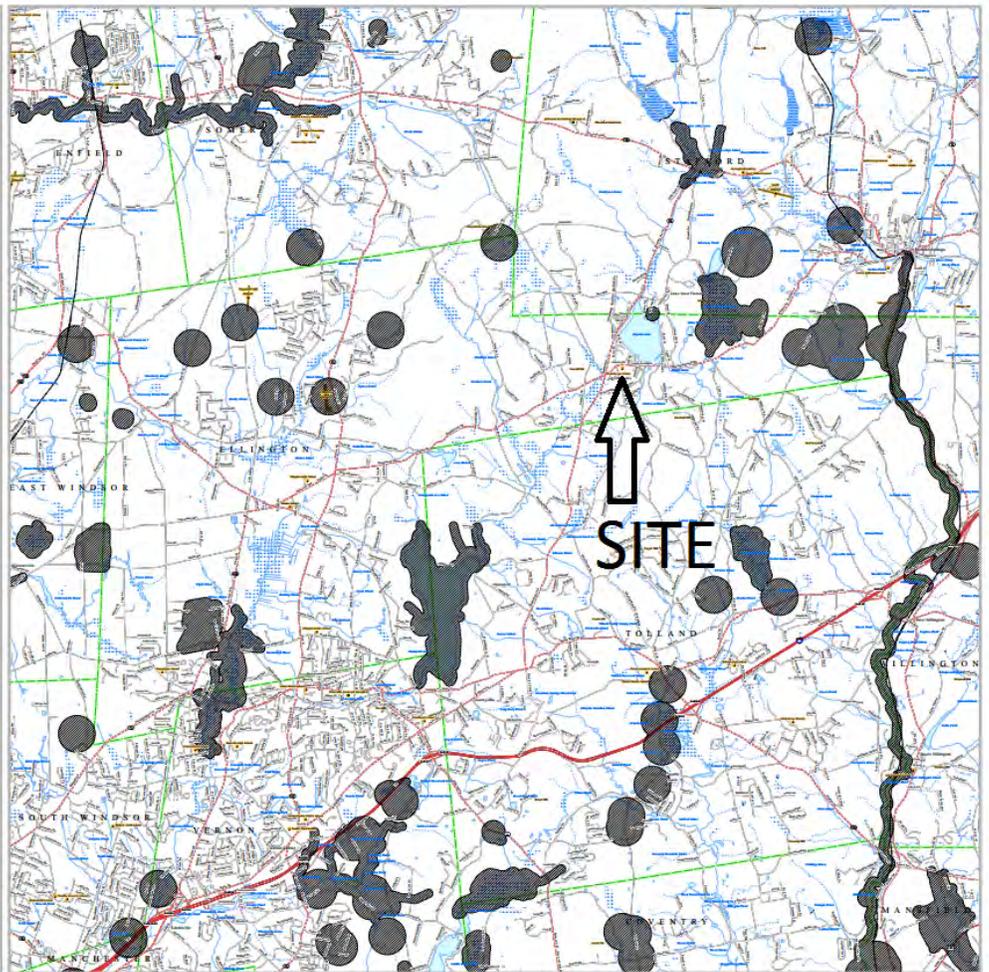
DATA SOURCES

STATE AND FEDERAL LISTED SPECIES AND SIGNIFICANT NATURAL COMMUNITIES: Data provided by the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources. USGS TOPOGRAPHIC MAPS: Data provided by the United States Geological Survey, National Wetlands Inventory. STATE BOUNDARIES: Data provided by the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources. COUNTY BOUNDARIES: Data provided by the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources. TOWN BOUNDARIES: Data provided by the Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources.



Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Hartford, Connecticut

Prepared by T. DEMP
Date: 10/2007



Attachment 3

Site Plans

Sheet C-100 Erosion and Sediment Control Plan
Sheet C-200 Site Demolition Plan
Sheet C-300 Layout & Materials Plan
Sheet C-301 Enlarged Layout & Materials Plan
Sheet C-400 Grading and Drainage Plan
Sheet C-401 Grading and Drainage Plan
Sheet C-700 Phasing Plan – Phase One
Sheet C-701 Phasing Plan – Phase Two
Sheet C-702 Phasing Plan – Phase Four

APPENDIX A
Inspection Reports

**CRYSTAL LAKE ELEMENTARY SCHOOL
 ELLINGTON, CONNECTICUT
 STORMWATER POLLUTION CONTROL PLAN
 INSPECTION REPORT**

Inspections to be completed every 7 days and within 24 hours of the end of a storm that generates a discharge

Inspection date: _____	Report Number: _____
-------------------------------	-----------------------------

Qualified Inspector's name (Print): _____

Inspector's Title: _____ Inspector's Affiliation: _____

Inspector's qualifications:

Days since last rainfall: _____ Amount of last rainfall: _____ inches (based on rain gage data)

Current Weather: Temperature: _____ degrees F Wind (Speed/Direction): _____

Current Precipitation (Indicate conditions during inspection): _____

Was water quality monitoring performed during the inspection: Yes No

Major observations relating to erosion and sediment controls and the implementation of the Plan. Include a description of the stormwater discharge(s) from the site.

DISTURBED SOIL STABILIZATION MEASURES

Area of the site	Last disturbance (Date)	Next disturbance (Date)	Stabilized? (Yes/No)	Stabilized with?	Condition

STABILIZED CONSTRUCTION ENTRANCES (ANT-TRACKING PAD)

Area of the site	Does much sediment get tracked onto the street?	Is the gravel clean or is it filled with sediment?	Does all traffic use the stabilized entrance to leave the site?	Is the culvert beneath the entrance working? (If applicable)	Does the gravel need to be removed and replaced with clean gravel?

Indicate maintenance required (include additional sheets if necessary)

Item 1: _____

Responsible Party: _____ Address no later than (Date): _____

Item 2: _____

Responsible Party: _____ Address no later than (Date): _____

Item 3: _____

Responsible Party: _____ Address no later than (Date): _____

TEMPORARY STOCKPILES

Area of the site	Is the stockpile surrounded with a hay bale and silt fence barrier?	Condition of hay bales and silt fence	Is the stockpile securely covered with a tarp?	Has the stockpile been temporarily seeded? (If so when?)

Indicate maintenance required (include additional sheets if necessary)

Item 1: _____

Responsible Party: _____ Address no later than (Date): _____

Item 2: _____

Responsible Party: _____ Address no later than (Date): _____

Item 3: _____

Responsible Party: _____ Address no later than (Date): _____

Additional observations/notes:

TEMPORARY SEDIMENT TRAPS (TSTs)

Location	Is there any observable damage?	What are the current dimensions of the trap?	How deep is the water currently in the sediment trap?	Describe the quality of the water being discharged?	Does the accumulated sediment need to be removed?

Indicate maintenance required (include additional sheets if necessary)

Item 1: _____

Responsible Party: _____ Address no later than (Date): _____

Item 2: _____

Responsible Party: _____ Address no later than (Date): _____

Item 3: _____

Responsible Party: _____ Address no later than (Date): _____

In the judgment of the Qualified Inspector(s) conducting the site inspection, the site is

In Compliance Out of Compliance

with the terms and conditions of the Plan and General Permit.

Stabilization/repairs or remedial action required (include additional sheets if necessary)

Item 1: _____

Responsible Party: _____ Address no later than (Date): _____

Item 2: _____

Responsible Party: _____ Address no later than (Date): _____

Item 3: _____

Responsible Party: _____ Address no later than (Date): _____

Item 4: _____

Responsible Party: _____ Address no later than (Date): _____

Item 5: _____

Responsible Party: _____ Address no later than (Date): _____

Item 6: _____

Responsible Party: _____ Address no later than (Date): _____

QUALIFIED

INSPECTOR'S

SIGNATURE: _____ DATE: _____

Note: If the site inspection indicates that the site is out of compliance, refer to the summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the 2002 Guidelines) shall be implemented on site within 24 hours unless another schedule is specified in the 2002 Guidelines. Engineered corrective actions (as identified in the 2002 Guidelines) shall be implemented on site within seven (7) days, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

APPENDIX B
Stormwater Monitoring Reports



**Connecticut Department of
Energy & Environmental Protection**
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

**General Permit for the Discharge of Stormwater and Dewatering Wastewaters from
Construction Activities, issued 8/21/13, effective 10/1/13**
Stormwater Monitoring Report

SITE INFORMATION

Permittee: _____
 Mailing Address: _____
 Business Phone: _____ ext.: _____ Fax: _____
 Contact Person: _____ Title: _____
 Site Name: _____
 Site Address: _____
 Receiving Water (name, basin): _____
 Stormwater Permit No. GSN _____

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: _____ Date/Time Collected: _____
 Outfall Location(s) (lat/lon or map link): _____
 Person Collecting Sample: _____
 Storm Magnitude (inches): _____ Storm Duration (hours): _____
 Size of Disturbed Area at any time: _____

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall)

Avg = _____

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
 Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
 BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
 79 ELM STREET
 HARTFORD, CT 06106-5127
 ATTN: NEAL WILLIAMS

APPENDIX C
Washout Area Maintenance and Inspection Records

CRYSTAL LAKE ELEMENTARY SCHOOL
ELLINGTON, CONNECTICUT
STORMWATER POLLUTION CONTROL PLAN

WASHOUT AREA INSPECTION AND MAINTENANCE RECORD

Inspector's Name (Print): _____

Inspector's Title: _____ Inspector's Affiliation: _____

WASHOUT AREA INSPECTION SUMMARY

Inspection Date: _____

WASHOUT AREA MAINTENENACE SUMMARY

Maintenance Date: _____

Stabilization/repairs or remedial action required (include additional sheets if necessary)

Item 1: _____

Responsible Party: _____ Address no later than (Date): _____

Item 2: _____

Responsible Party: _____ Address no later than (Date): _____

Item 3: _____

Responsible Party: _____ Address no later than (Date): _____

SIGNATURE: _____ DATE: _____

APPENDIX D
Notice of Termination



General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: GSN			
2. Fill in the name of the registrant(s) as indicated on the registration certificate: Registrant:			
3. Site Address: City/Town: _____ State: _____ Zip Code: _____			
4. Date all storm drainage structures were cleaned of construction sediment: Date of Completion of Construction: _____ Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit): _____			
5. Check the post-construction activities at the site (check all that apply):			
<input type="checkbox"/> Industrial	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Capped Landfill
<input type="checkbox"/> Other (describe): _____			

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."	
_____ Signature of Permittee	_____ Date
_____ Name of Permittee (print or type)	_____ Title (if applicable)

Note: Please submit this Notice of Termination Form to:
STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes hollow-metal work.
- B. Related Requirements:
 - 1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors and frames.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. HPBS Submittals:
 - 1. Product Data for Section 16a-38k-6(d)(9): For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
- C. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.

7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal frame assembly, for tests performed by a qualified testing agency.

B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

B. Deliver welded frames with two (2) removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum ¼-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:

1. Steelcraft; an Ingersoll-Rand company.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ceco Door Products; an Assa Abloy Group company.
2. Curries Company; an Assa Abloy Group company.
3. Substitutions: Under provisions of Section 012500 "Substitution Procedures".

C. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
- B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.
 - 1. Physical Performance: Level A according to SDI A250.4.
 - 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1¾ inches.
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard Kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
 - 3. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch.
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Knocked down at existing construction, face welded at new construction.
 - 4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL FRAMES

- A. Construct exterior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Maximum-Duty Doors and Frames: SDI A250.8, Level 4.

1. Physical Performance: Level A according to SDI A250.4.
2. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum A40 coating.
 - b. Construction: Knocked down at existing construction, face welded at new construction.
3. Exposed Finish: Prime.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.6 MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than twenty-five percent (25%).
- B. Cold-Rolled Steel Sheet: ASTM A 1008, Commercial Steel (CS), Type B; suitable for exposed applications.
- C. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008 or ASTM A 1011, hot-dip galvanized according to ASTM A 153, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143.
- H. Glazing: Comply with requirements in Section 088000 “Glazing”.
- I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches.
 - 2. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
 - 3. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four (4) spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
 - 1) Two (2) anchors per jamb up to 60 inches high.
 - 2) Three (3) anchors per jamb from 60 to 90 inches high.
 - 3) Four (4) anchors per jamb from 90 to 120 inches high.
 - 4) Four (4) anchors per jamb plus one (1) additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

- b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three (3) anchors per jamb up to 60 inches high.
 - 2) Four (4) anchors per jamb from 60 to 90 inches high.
 - 3) Five (5) anchors per jamb from 90 to 96 inches high.
 - 4) Five (5) anchors per jamb plus one (1) additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - c. Compression Type: Not less than two (2) anchors in each frame.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
- a. Single-Door Frames: Drill stop in strike jamb to receive three (3) door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two (2) door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
- 1. Reinforce frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
- 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Provide fixed frame moldings on secure side of interior doors.
 - 3. Provide loose stops and moldings on inside of hollow-metal work.
 - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
- 2.8 STEEL FINISHES
- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
- 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- 2.9 ACCESSORIES
- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 4. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 5. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 6. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 3/4 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
 2. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.

HOLLOW METAL DOORS AND FRAMES

- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. Section 083473 "Sound Control Door Assemblies" for acoustic flush wood doors.
2. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

B. HPBS Submittals:

1. Certificates for Section 16a-38k-6(d)(13): Chain-of-custody certificates indicating that flush wood doors comply with forest certification requirements. Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.
2. Product Data for Section 16a-38k-6(b)(4): For adhesives and composite wood products, documentation indicating that product contains no urea formaldehyde.

- C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

D. Samples:

1. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide Samples for each species of veneer and solid lumber required.
 - b. Provide Samples for each color, texture, and pattern of plastic laminate required.
 - c. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.
2. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.
- B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than ¼ inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Algoma Hardwoods, Inc.
 2. Eggers Industries.
 3. Graham Wood Doors; an Assa Abloy Group company.
 4. Substitutions: Under provisions of Section 012500 "Substitution Procedures".
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Standards."
1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
- B. Certified Wood: Flush wood doors shall be certified as "FSC Pure" or "FSC Mixed Credit" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and to FSC STD-40-004, "FSC Standard for Chain of Custody Certification."
- C. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.
- D. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- E. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- F. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-2, made with binder containing no urea-formaldehyde.
 2. Blocking: Provide wood blocking in particleboard-core doors as follows:
 - a. 5-inch top-rail blocking, in doors indicated to have closers.

- b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
- c. 5-inch midrail blocking, in doors indicated to have exit devices.

G. Mineral-Core Doors:

- 1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
- 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as follows:
 - a. 5-inch top-rail blocking.
 - b. 5-inch bottom-rail blocking, in doors indicated to have protection plates.
 - c. 5-inch midrail blocking, in doors indicated to have exit devices and armor plates.
- 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

- 1. Grade: Premium, with Grade AA faces.
- 2. Species: Select clear maple.
- 3. Cut: Rotary cut.
- 4. Match between Veneer Leaves: Book match.
- 5. Assembly of Veneer Leaves on Door Faces: Balance match.
- 6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
- 7. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.
- 8. Exposed Vertical and Top Edges: Same species as faces - edge Type A.
- 9. Core: Particleboard or mineral.
- 10. Construction: Five (5) or seven (7) plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.

2.4 LIGHT FRAMES AND LOUVERS

- A. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- 1. Comply with NFPA 80 requirements for fire-rated doors.

- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- C. Openings: Factory cut and trim openings through doors.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four (4) edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: AWI's "Architectural Woodwork Standards" System 5, conversion varnish or System 11, catalyzed polyurethane.
 - 3. Staining: **WD-2**, as indicated in Section 090000 "Schedule of Finishes".
 - 4. Effect: Filled finish.
 - 5. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.
2. Install smoke- and draft-control doors according to NFPA 105.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 083313 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Counter doors.

B. Related Requirements:

- 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of coiling counter door and accessory.

- 1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

- 1. Include plans, elevations, sections, and mounting details.
- 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
- 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

- 1. Include similar Samples of accessories involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For coiling counter doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

- A. Source Limitations: Obtain coiling counter doors from single source from single manufacturer.

2.2 COUNTER DOOR ASSEMBLY

- A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.
 - 1. Basis-of-Design Product:
 - a. Overhead Door Corporation; **Series 650**
 - 2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. C.H.I. Overhead Doors
 - b. Cookson Company
 - c. Cornell Iron Works, Inc.
 - d. Raynor
 - e. Wayne-Dalton Corp.
 - f. Substitutions: Under provisions of Section 012500 "Substitution Procedures".
- B. Operation Cycles: Door components and operators capable of operating for not less than twenty thousand (20,000). One (1) operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats: Flat profile slats of 1½-inch center-to-center height.
- E. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, fabricated hot-dip galvanized steel and finished to match door.
- F. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats.
- G. Hood: Match curtain material and finish.
 - 1. Shape: Square.
 - 2. Mounting: Face of wall.
- H. Sill Configuration: No sill.

- I. Locking Devices: Equip door with locking device assembly.
 - 1. Locking Device Assembly: Cremona type, both jamb sides locking bars, operable from inside only, with cylinder.
- J. Manual Door Operator: Push-up operation.
- K. Curtain Accessories: Equip door with push/pull handles.
- L. Door Finish:
 - 1. Baked-Enamel or Powder-Coated Finish: Color as selected by Architect and Owner from manufacturer's full range, to match frame color.

2.3 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate coiling counter-door curtain of interlocking metal slats in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 - 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653, with G90 zinc coating; nominal sheet thickness (coated) of 22 gauge; and as required.
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.4 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 - 1. Galvanized Steel: Nominal 0.028-inch- thick, hot-dip galvanized steel sheet with G90 zinc coating, complying with ASTM A 653.

2.5 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Cylinders standard with manufacturer and keyed to building keying system.
 - 2. Keys: Two (2) for each cylinder.

2.6 CURTAIN ACCESSORIES

- A. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handle on interior side of door, finished to match door.

2.7 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.
- C. Counterbalance Spring: One (1) or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.8 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Push-up Door Operation: Design counterbalance mechanism so that required lift or pull for door operation does not exceed 25 lbf.

2.9 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.10 STEEL AND GALVANIZED-STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install coiling counter doors, hoods, controls, and operators at the mounting locations indicated for each door.

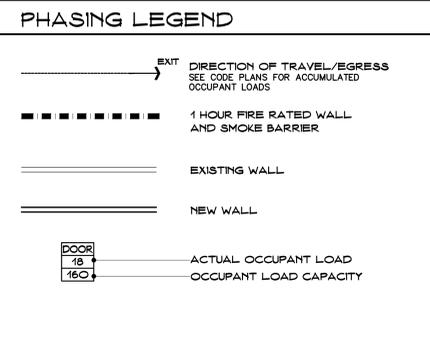
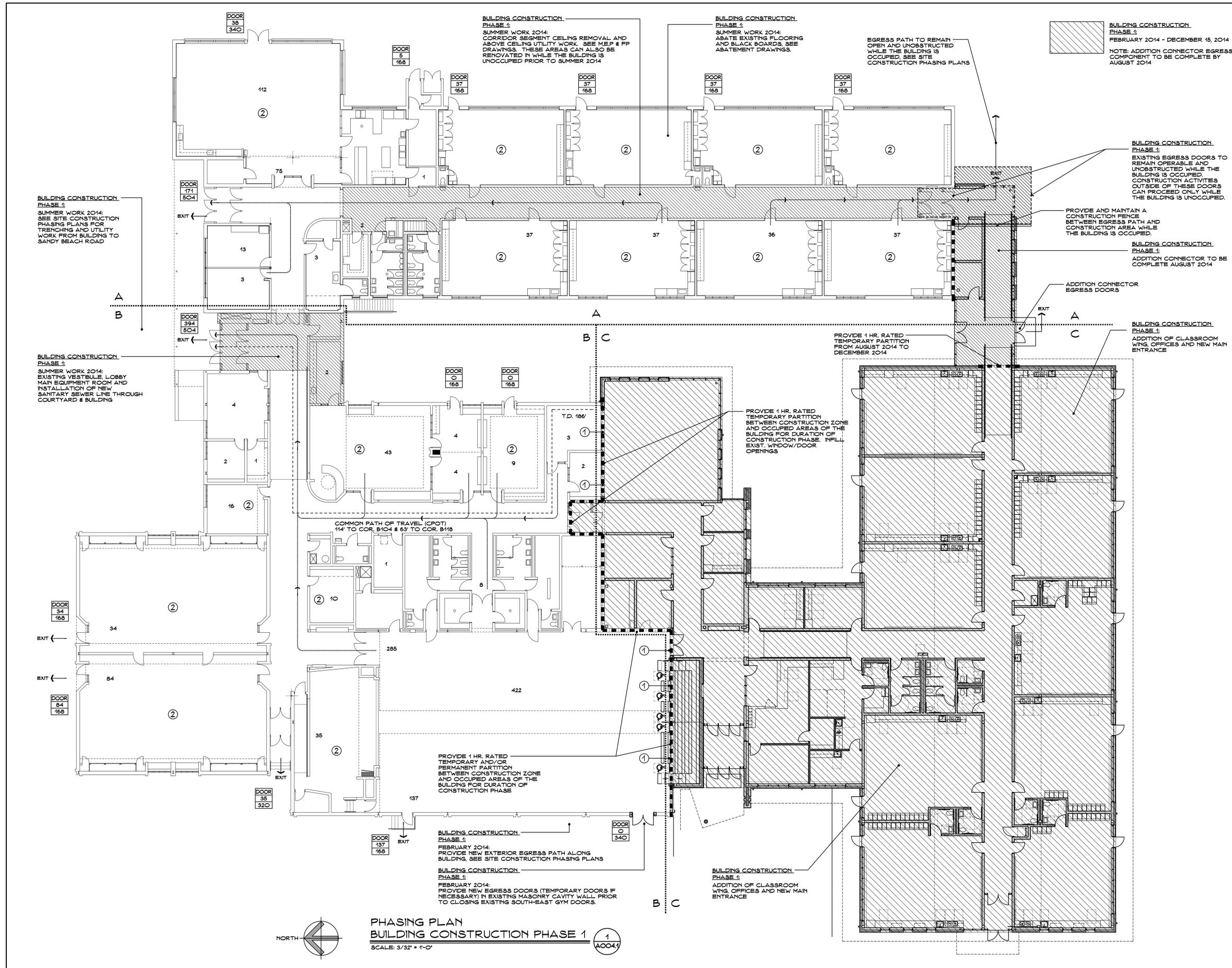
3.3 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

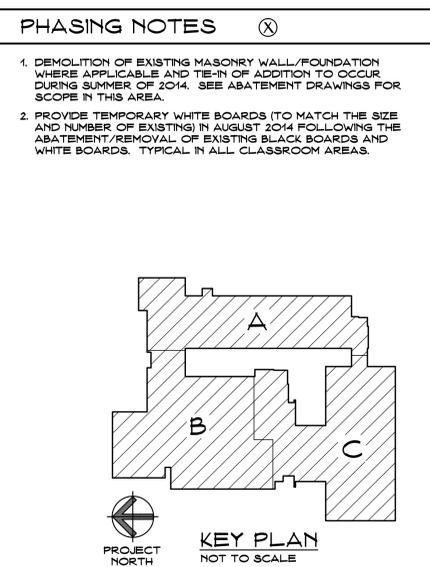
3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain coiling counter doors.

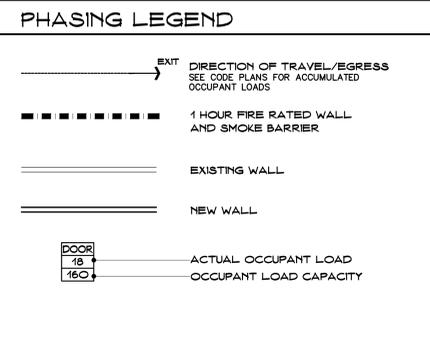
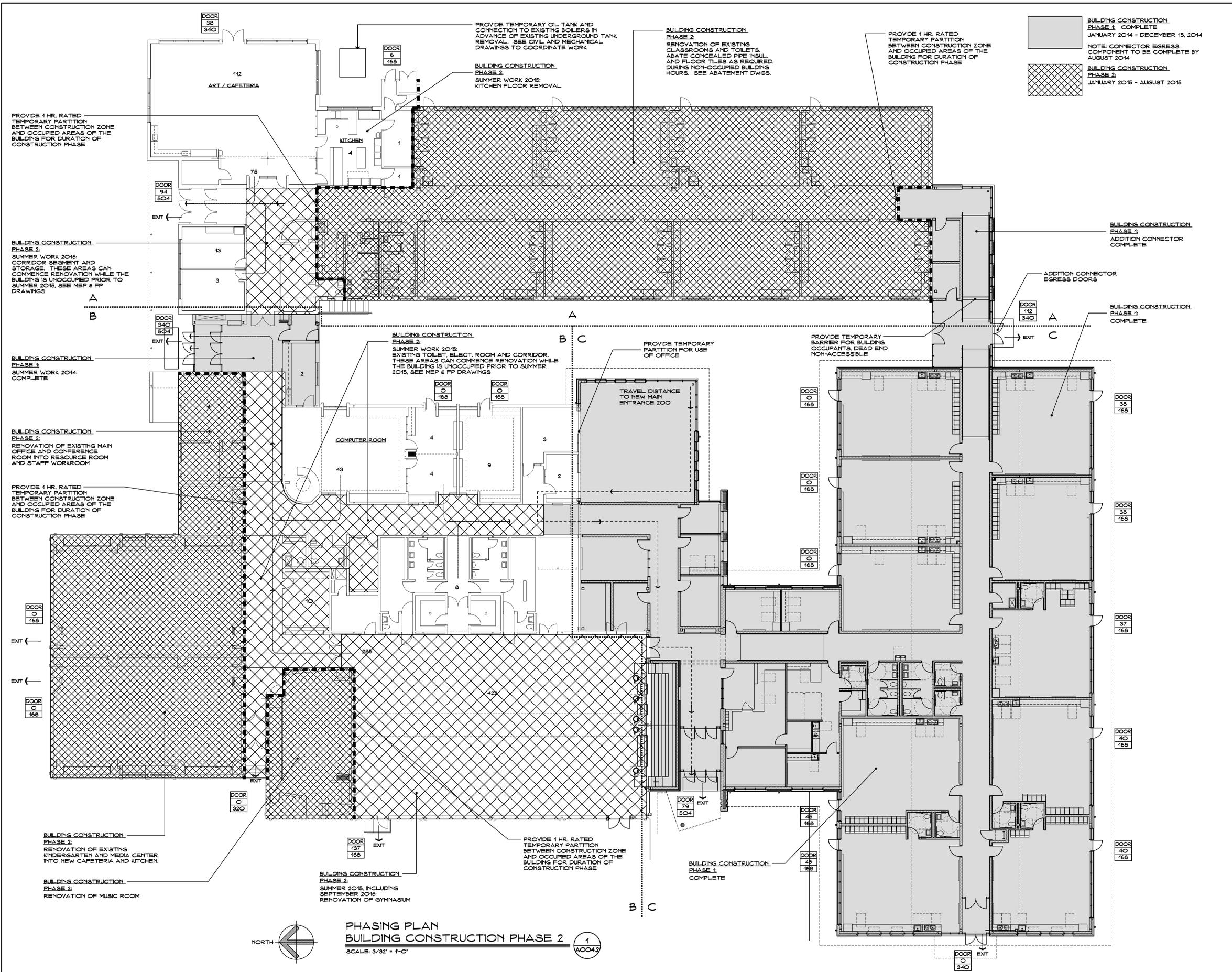
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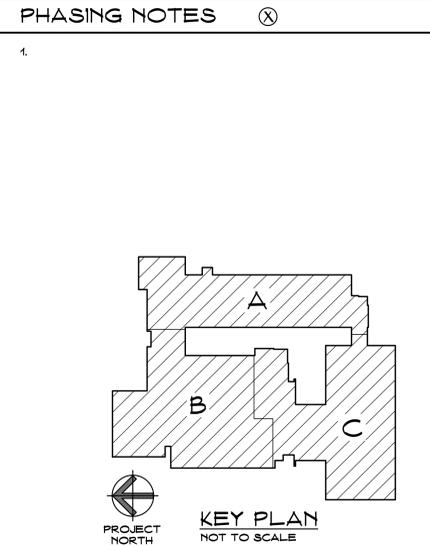
- ### GENERAL PHASING NOTES
1. PHASING FLOOR PLANS ARE CONCEPTUAL IN NATURE AND HAVE BEEN INCLUDED TO SHOW THE GENERAL INTENT AND SEQUENCE OF CONSTRUCTION AREAS. CONTRACTOR(S) SHALL PROVIDE DETAILED PHASING SCHEDULES, SITE STAGING DIAGRAMS AND EGRESS PATTERNS AS REQUIRED BY THE LOCAL OFFICIALS PRIOR TO STARTING WORK IN EACH CONSTRUCTION PHASE.
 2. THE BUILDING WILL BE OCCUPIED DURING CONSTRUCTION PHASES, NOT INCLUDING SUMMER VACATIONS FOR THE DURATION OF CONSTRUCTION. CONTRACTOR(S) SHALL PROTECT AND KEEP OPEN BUILDING ENTRANCES AND EXITS AS REQUIRED ON A PHASE BY PHASE BASIS. CONTRACTOR(S) SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE SCHOOL SCHEDULE AND PROVIDE SCHOOL ADMINISTRATORS REGULARLY UPDATED CONSTRUCTION SCHEDULES PRIOR TO COMMENCING WORK.
 3. WALLS AND FLOORS BETWEEN A CONSTRUCTION ZONE AND OCCUPIED AREAS OF THE BUILDING SHALL BE 1 HR. RATED OR CONSIST OF EQUIVALENT EXISTING CONSTRUCTION TO ACHIEVE THE REQUIRED RATING.
 4. SEAL ALL TOP OF WALL OPENINGS AND ABOVE CEILING PENETRATIONS BETWEEN EACH CONSTRUCTION PHASE/ZONE AND OCCUPIED AREAS OF THE BUILDING. FOR OPENINGS GREATER THAN 3" PROVIDE WALL PATCHING TO MATCH EXISTING WALL. CONSTRUCTION SHALL PROVIDE FIRE SAFING INSULATION AND SEALANT AT/AROUND ALL UTILITY PENETRATIONS, SLEEVES AND TOP OF WALL GAPS LESS THAN 3".
 5. REFER TO MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION AND ALL OTHER DISCIPLINES AS REQUIRED FOR ADDITIONAL PHASING INFORMATION.
 6. REFER TO CODE FLOOR PLAN, A03 FOR TRAVEL DISTANCE INFORMATION UNLESS OTHERWISE NOTED (TD XXX).
 7. PROVIDE TEMPORARY EXTERIOR CONSTRUCTION FENCE AS REQUIRED TO SEPARATE CONSTRUCTION ZONE(S) FROM OCCUPIED AREAS OF THE SITE. COORDINATE EXACT FENCE PLACEMENT AND ALL PROPOSED ALTERED SITE CIRCULATION PATTERNS WITH LOCAL OFFICIALS, SCHOOL ADMINISTRATION AND ARCHITECT PRIOR TO FENCING.
 8. NOTE: CRYSTAL LAKE SCHOOL WILL BE OPEN AND OPERATIONAL DURING CONSTRUCTION PHASES. THE SCHOOL ADMINISTRATORS RESERVE THE RIGHT TO HALT ANY CONSTRUCTION ACTIVITY THAT INTERRUPTS SCHOOL OPERATIONS, TEACHING AND LEARNING AT NO ADDITIONAL COST TO THE PROJECT.
 - SCHOOL HOURS OF OPERATION (REFERRED TO AS THE TIME WHILE THE BUILDING IS OCCUPIED) ARE MONDAY THROUGH FRIDAY 7:00AM TO 5:00PM AND EVENING HOURS AS REQUESTED IN ADVANCE BY THE OWNER. CONTRACTOR TO WORK AROUND HOURS OF OPERATION WHERE NOTED ON THE PHASING PLANS. SEE ALSO PROJECT MANUAL FOR SCHOOL CALENDAR AND VACATION DAYS.
 9. PER THE ORDER OF THE LOCAL BUILDING OFFICIAL AND FIRE MARSHAL ALL CONSTRUCTION ACTIVITY SHALL TEMPORARILY BE HALTED, BOTH INSIDE THE BUILDING AND ON-SITE, DURING SCHOOL FIRE ALARM DRILLS, LOCK DOWN DRILLS AND CRISIS RESPONSE DRILLS.
 10. PROVIDE CODE MINIMUM LIGHTING AT ALL TEMPORARY EGRESS ROUTES, BOTH INSIDE AND OUTSIDE OF BUILDING. SEE ELECTRICAL DWGS.
 11. REFER TO ABATEMENT DRAWINGS FOR ABATEMENT SCOPE AND GENERAL SEQUENCING OF HAZARDOUS MATERIAL REMOVALS.



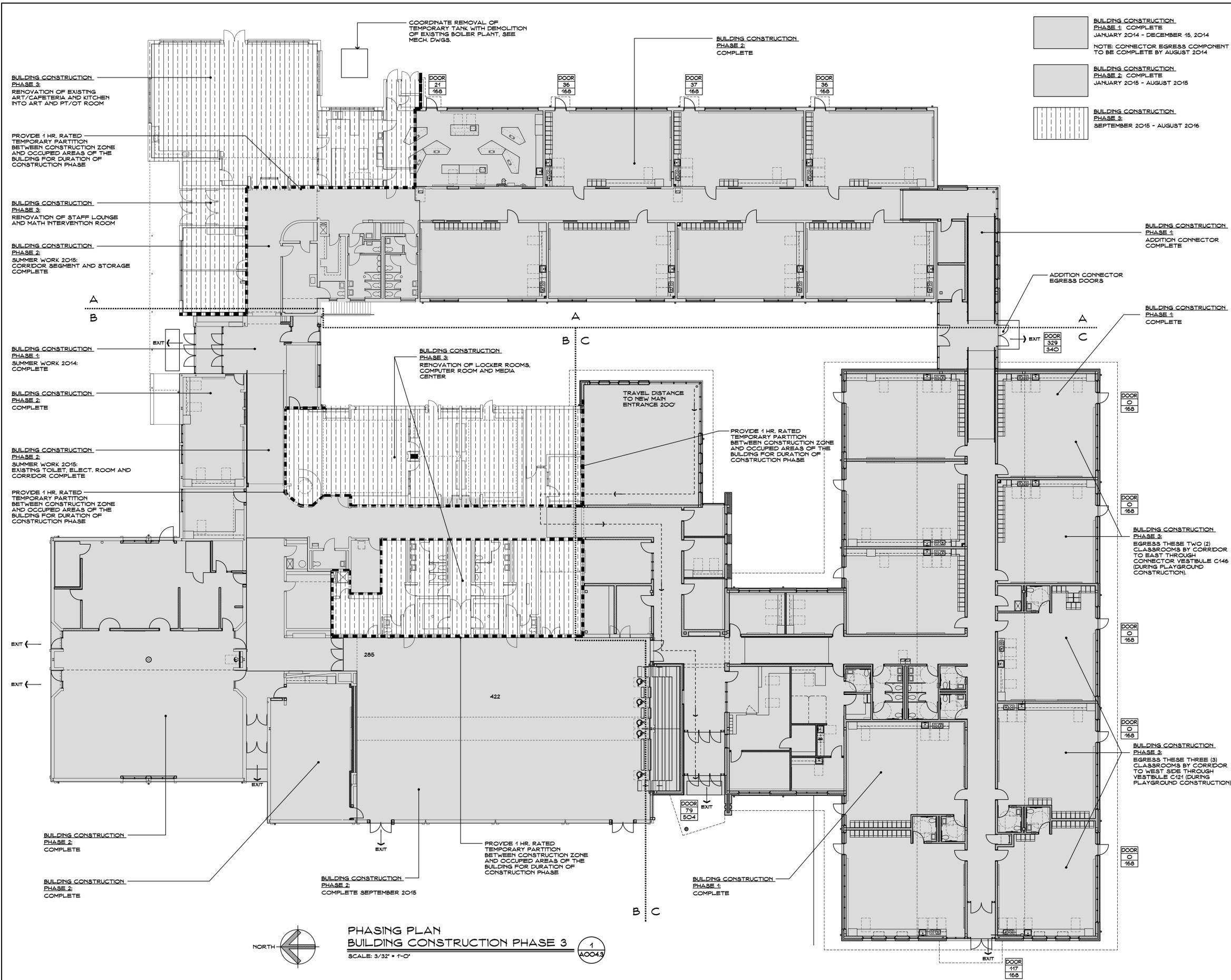
PHASING PLAN
BUILDING CONSTRUCTION PHASE 1
 SCALE: 3/32" = 1'-0"
 1 A004.1



- ### GENERAL PHASING NOTES
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 - THE BUILDING WILL BE OCCUPIED DURING MANY (MOST) CONSTRUCTION PHASES, HOWEVER NOT INCLUDING SUMMER VACATIONS FOR THE DURATION OF CONSTRUCTION. CONTRACTOR(S) SHALL PROTECT AND KEEP OPEN BUILDING ENTRANCES AND EXITS AS REQUIRED ON A PHASE BY PHASE BASIS. CONTRACTOR(S) SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH THE SCHOOL SCHEDULE AND PROVIDE SCHOOL ADMINISTRATORS REGULARLY UPDATED CONSTRUCTION SCHEDULES PRIOR TO COMMENCING WORK.
 - WALLS AND FLOORS BETWEEN A CONSTRUCTION ZONE AND OCCUPIED AREAS OF THE BUILDING SHALL BE 1 HR. RATED OR CONSIST OF EQUIVALENT EXISTING CONSTRUCTION TO ACHIEVE THE REQUIRED RATING.
 - SEAL ALL TOP OF WALL OPENINGS AND ABOVE CEILING PENETRATIONS BETWEEN EACH CONSTRUCTION PHASE/ZONE AND OCCUPIED AREAS OF THE BUILDING. FOR OPENINGS GREATER THAN 3\"/>



PHASING PLAN
BUILDING CONSTRUCTION PHASE 2
 SCALE: 3/32" = 1'-0"
 1 A0042



PHASING PLAN
BUILDING CONSTRUCTION PHASE 3
 SCALE: 3/32" = 1'-0"
 1 A004.3

BUILDING CONSTRUCTION PHASE 1: COMPLETE
 JANUARY 2014 - DECEMBER 15, 2014
 NOTE: CONNECTOR EGRESS COMPONENT TO BE COMPLETE BY AUGUST 2014

BUILDING CONSTRUCTION PHASE 2: COMPLETE
 JANUARY 2015 - AUGUST 2015

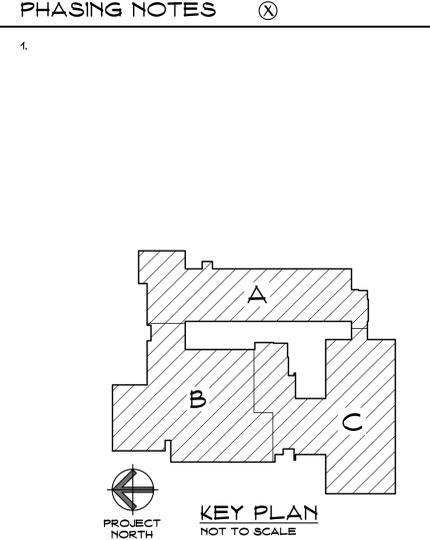
BUILDING CONSTRUCTION PHASE 3: COMPLETE
 SEPTEMBER 2015 - AUGUST 2016

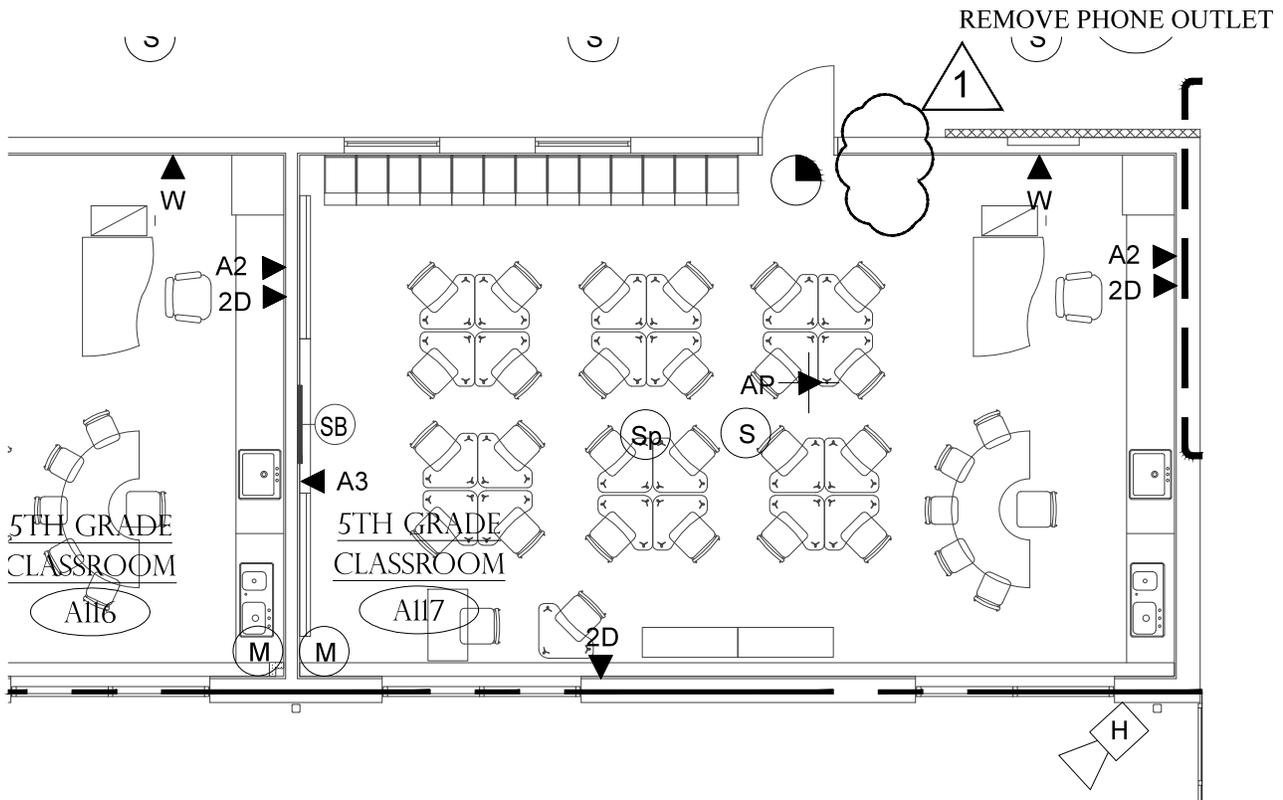
PHASING LEGEND

- EXIT: DIRECTION OF TRAVEL/EGRESS SEE CODE PLANS FOR ACCUMULATED OCCUPANT LOADS
- 1 HOUR FIRE RATED WALL AND SMOKE BARRIER
- EXISTING WALL
- NEW WALL
- DOOR: ACTUAL OCCUPANT LOAD
- DOOR: OCCUPANT LOAD CAPACITY

- GENERAL PHASING NOTES**
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SCHOOL HOURS OF OPERATION (REFERRED TO AS THE TIME WHILE THE BUILDING IS OCCUPIED) ARE MONDAY THROUGH FRIDAY 7:00AM TO 5:00PM AND EVENING HOURS AS REQUESTED IN ADVANCE BY THE OWNER. CONTRACTOR TO WORK AROUND HOURS OF OPERATION WHERE NOTED ON THE PHASING PLANS. SEE ALSO PROJECT MANUAL FOR SCHOOL CALENDAR AND VACATION DAYS.
 - PER THE ORDER OF THE LOCAL BUILDING OFFICIAL AND FIRE MARSHAL ALL CONSTRUCTION ACTIVITY SHALL TEMPORARILY BE HALTED, BOTH INSIDE THE BUILDING AND ON-SITE, DURING SCHOOL FIRE ALARM DRILLS, LOCK DOWN DRILLS AND CRISIS RESPONSE DRILLS.
 - PROVIDE CODE MINIMUM LIGHTING AT ALL TEMPORARY EGRESS ROUTES, BOTH INSIDE AND OUTSIDE OF BUILDING. SEE ELECTRICAL DWGS.
 - REFER TO ABATEMENT DRAWINGS FOR ABATEMENT SCOPE AND GENERAL SEQUENCING OF HAZARDOUS MATERIAL REMOVALS.





REFER TO DRAWING T203

Project Title:

Expansion and Renovate as New Project - PHASE 1 of 3

**Crystal Lake
Elementary School**

284 Sandy Beach Road
Ellington, Connecticut 06029



**SILVER /
PETRUCELLI +
ASSOCIATES**
Architects / Engineers / ID

3190 Whitney Avenue, Hamden, CT 06518-2340
Tel. 203 230 9007 Fax. 203 230 8247
silverpetrucelli.com

Drawing Title:

**5TH GRADE CLASSROOM
ROOM A117
REMOVAL OF WALL PHONE
ADDENDUM #1**

State Project No: 048-0058-EA/RR/PS

Date:

12/5/13

Scale:

1/8" = 1'

Drawn By:

ND

Project Number:

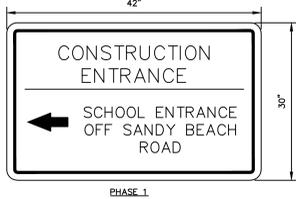
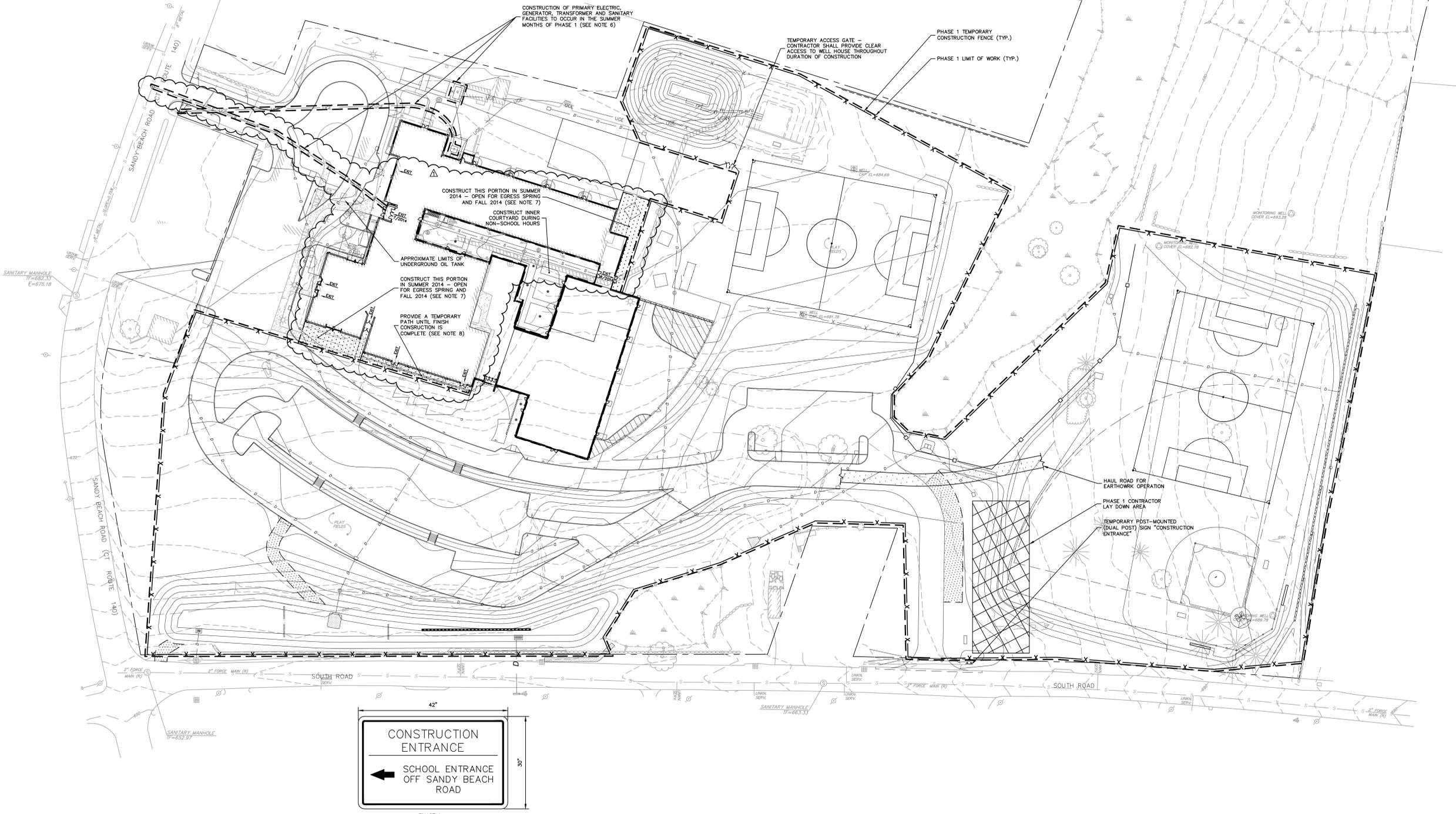
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Drawing Number:

SKT01

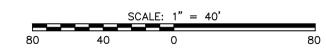
- NOTES:**
1. CONSTRUCTION SCHEDULE: FEBRUARY 2014 - DECEMBER 2014.
 2. EARTHWORK: THE MAJORITY OF EARTHWORK OPERATIONS WILL OCCUR IN PHASE 1, WITH BORROW COMING FROM THE SOUTH PORTION OF THE SITE TO THE AREAS ADJACENT THE SCHOOL.
 3. SCHOOL SITE OPERATIONS (PARKING, BUS DROP, PARENT DROP): DO NOT DISRUPT EXISTING SITE OPERATIONS BY PHYSICALLY SEPARATING THE EXISTING AREA NORTH OF THE BUILDING FROM ALL CONSTRUCTION. THE EXISTING BITUMINOUS AREA EAST OF THE SCHOOL WILL BE USED BY THE CHILDREN FOR RECREATION.
 4. CONSTRUCTION SITE OPERATIONS (ACCESS, TRAILER AND LAYDOWN AREA): ALL CONSTRUCTION TRAFFIC WILL BE OFF SOUTH ROAD AND THE LAYDOWN AND CONSTRUCTION TRAILER AREA WOULD BE SOMEWHERE JUST SOUTH OF THE NEW SOUTH ROAD CONNECTION DRIVEWAY. THE BITUMINOUS AREAS WILL BE GIVEN A WEARING COURSE IN THE LATE SPRING/EARLY SUMMER OF 2014 AND A FINISH COURSE JUST PRIOR TO SCHOOL OPENING IN THE LATE SUMMER OF 2014.
 5. UTILITIES: THE EXISTING SITE LIGHTING NORTH OF THE SCHOOL WILL NOT BE DISRUPTED. THE NEW SANITARY CONNECTION WILL NEED TO BE CONSTRUCTED IN THIS PHASE BEFORE THE CONSTRUCTION OF THE BUILDING ADDITION SINCE THE NEW ADDITION WILL BE CONSTRUCTED OVER THE EXISTING SEPTIC AREA. THE FIRE PUMP WILL BE CONSTRUCTED IN THIS PHASE.
 6. CONSTRUCT PRIMARY ELECTRIC DUCT BANK, GENERATOR, TRANSFORMER AND ASSOCIATED CONCRETE PADS, AS WELL AS SANITARY FACILITIES FROM THE BUILDING TO THE ROUTE 140 SANITARY MAIN IN THE SUMMER MONTHS OF PHASE 1. ALL WORK ASSOCIATED WITH THIS SHALL OCCUR DURING NON-SCHOOL HOURS. DISTURBED PAVEMENT SHALL BE COLD PATCHED. CONTRACTOR SHALL PLAN THIS WORK SUCH THAT IT WILL NOT CAUSE ANY DISRUPTION TO SCHOOL OPERATIONS.
 7. AREAS SHOWN AS HATCHED MUST BE AVAILABLE FOR EGRESS AT ALL TIMES DURING HOURS THE SCHOOL IS OCCUPIED. THESE AREAS SHALL BE CONSTRUCTED DURING THE SUMMER MONTHS OF PHASE 1.
 8. A TEMPORARY SIX (6) FOOT WIDE STONE DUST PATH SHALL BE CONSTRUCTED ADJACENT THE BUILDING. THE CONTRACTOR IS RESPONSIBLE FOR FILL AND GRADING, AS NECESSARY, TO PROVIDE AN ACCESSIBLE PATH FROM THE EGRESS DOORS TO THE EXISTING SANDY BEACH PARKING AREA.
 9. PHASING PLANS ARE CONCEPTUAL IN NATURE AND HAVE BEEN INCLUDED TO SHOW THE GENERAL INTENT AND SEQUENCE OF CONSTRUCTION AREAS. CONTRACTOR(S) SHALL PROVIDE DETAILED PHASING SCHEDULES AND SITE STAGING DIAGRAMS AS REQUIRED BY LOCAL OFFICIALS PRIOR TO STARTING WORK IN EACH CONSTRUCTION PHASE.

- LEGEND**
- PHASE LIMIT OF WORK
 - X- TEMPORARY CONSTRUCTION FENCE
 - PROPERTY LINE



- NOTES**
1. LETTER COLOR SHALL BE BLACK AGAINST WHITE BACKGROUND, LETTER HEIGHT SHALL BE 3.0".
 2. MOUNT SIGN AS INDICATED ON THE PHASING PLAN - SUBMIT SHOP DRAWING OF SIGNS TO ENGINEER.

TEMPORARY CONSTRUCTION PHASING SIGNAGE
SCALE: NONE



BSC GROUP
180 Glastonbury Boulevard
Suite 103
Glastonbury, Connecticut 06033
860 652 8227

Project Title:
Expansion and Renovate as New Project - PHASE 1 of 3
Crystal Lake Elementary School
284 Sandy Beach Road
Ellington, Connecticut 06029

SILVER / PETRUCELLI + ASSOCIATES
Architects / Engineers / Interior Designers
3190 Whitney Avenue, Hamden, CT 06518-2340
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silverpetrucelli.com

Revision	Description	Date	Revised By
--	ISSUED FOR BIDDING	NOV 26, 2013	--
Δ	ADDENDUM #1	DEC 5, 2013	WGW

Drawing Title:
Phasing Plan - Site Construction Phase One
State Project Number 048-0058 EA/RR/PS

Date:
JUNE 18, 2013
Scale:
1"=40'
Drawn By:
WGW
Project Number:
12.140

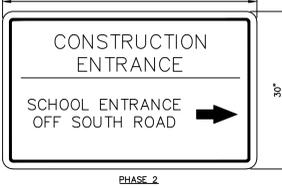
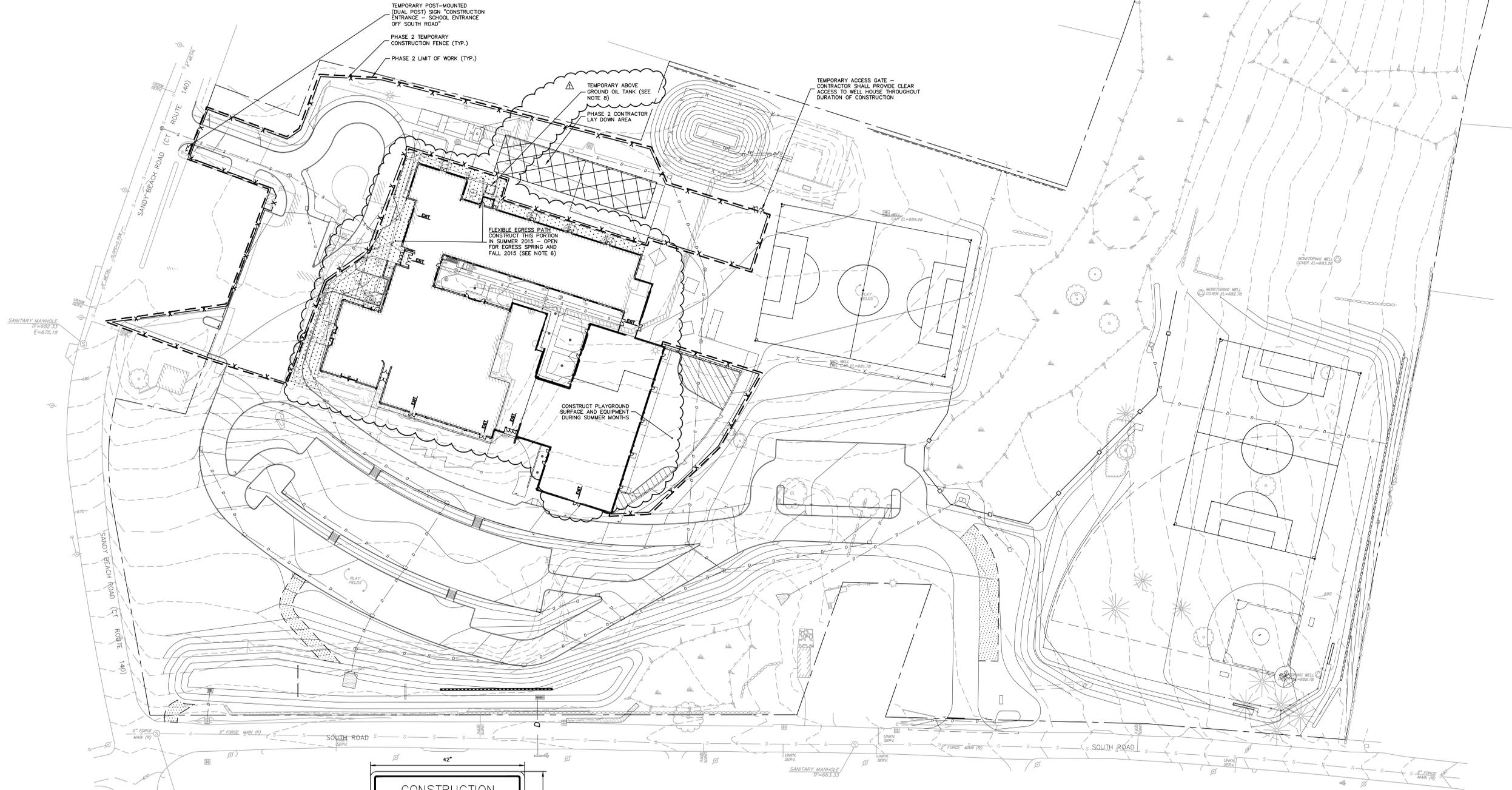
Drawing Number:
C-700

NOTES:

1. CONSTRUCTION SCHEDULE: JANUARY 2015 - AUGUST 2015.
2. EARTHWORK: VERY LITTLE EARTHWORK IS ASSOCIATED WITH THIS PHASE.
3. SCHOOL SITE OPERATIONS: ALL ACCESS WILL BE FROM SOUTH ROAD AND WILL TAKE PLACE USING THE NEWLY CONSTRUCTED AREAS FROM PHASE 1. BUS DROP OFF WILL OCCUR AS DESIGNED. PARENT DROP OFF WILL TEMPORARILY OCCUR AT THE U-10 FIELD PARKING AREA AND WILL REQUIRE MONITORS. THE NEW U-10 FIELD WILL BE USED BY THE CHILDREN FOR RECREATION.
4. CONSTRUCTION SITE OPERATIONS: ALL CONSTRUCTION TRAFFIC WILL BE OFF SANDY BEACH ROAD. THE LAY DOWN AREA AND SITE TRAILER WILL BE EAST OF THE SCHOOL IN THE LOCATION OF THE CURRENT BITUMINOUS OVERFLOW AREA. ALL PAVING AND LANDSCAPING WILL BE DONE PRIOR TO THE WINTER MONTHS.
5. UTILITIES: SITE LIGHTING IN THE NEWLY CONSTRUCTED AREAS WILL BE IN PLACE FROM PHASE 1 CONSTRUCTION, AS WELL AS THE SANITARY FACILITIES. NEW POWER, TELECOM, AND HEATING WILL NEED TO BE CONSTRUCTED PRIOR TO DISCONNECTING THESE EXISTING UTILITIES.
6. CONTRACTOR SHALL PROVIDE AN ACCESSIBLE SIX (6) FOOT WIDE PATH AT ALL TIMES THE SCHOOL IS OCCUPIED. THE PATH SHALL BE PHYSICALLY SEPARATED FROM ALL CONSTRUCTION, BOTH ON THE SITE AND AGAINST THE BUILDING. THE PATH MAY BE AGAINST THE BUILDING, BUT DURING TIMES WORK IS OCCURRING ON THE OUTSIDE OF THE BUILDING (FACADE, WINDOWS, ETC.) THE PATH SHALL CONTAIN TEMPORARY CONSTRUCTION FENCE ON BOTH SIDES, TO PROTECT IT FROM BOTH THE BUILDING AND THE SITE PHASE 2 CONSTRUCTION.
7. PHASING PLANS ARE CONCEPTUAL IN NATURE AND HAVE BEEN INCLUDED TO SHOW THE GENERAL INTENT AND SEQUENCE OF CONSTRUCTION AREAS. CONTRACTOR(S) SHALL PROVIDE DETAILED PHASING SCHEDULES AND SITE STAGING DIAGRAMS AS REQUIRED BY LOCAL OFFICIALS PRIOR TO STARTING WORK IN EACH CONSTRUCTION PHASE.
8. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY ABOVE GROUND OIL TANK, AS WELL AS TEMPORARY UNDERGROUND PIPING DIRECTLY TO THE BUILDING (WHERE IT CAN ACCESS THE BUILDING TUNNEL NETWORK) AND THROUGH THE BUILDING TUNNEL NETWORK TO THE BOILER ROOM.

LEGEND

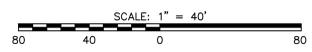
- PHASE LIMIT OF WORK
- X- TEMPORARY CONSTRUCTION
- PROPERTY LINE



NOTES:

1. LETTER COLOR SHALL BE BLACK AGAINST WHITE BACKGROUND, LETTER HEIGHT SHALL BE 3.0".
2. MOUNT SIGN AS INDICATED ON THE PHASING PLAN - SUBMIT SHOP DRAWING OF SIGNS TO ENGINEER.

TEMPORARY CONSTRUCTION PHASING SIGNAGE
SCALE: NONE



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Revision:	Description:	Date:	Revised By:
--	ISSUED FOR BIDDING	NOV 26, 2013	--
Δ	ADDENDUM #1	DEC 5, 2013	WGW

Drawing Title:
Phasing Plan - Site Construction Phase Two
State Project Number 048-0058 EA/RR/PS

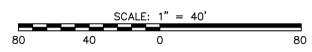
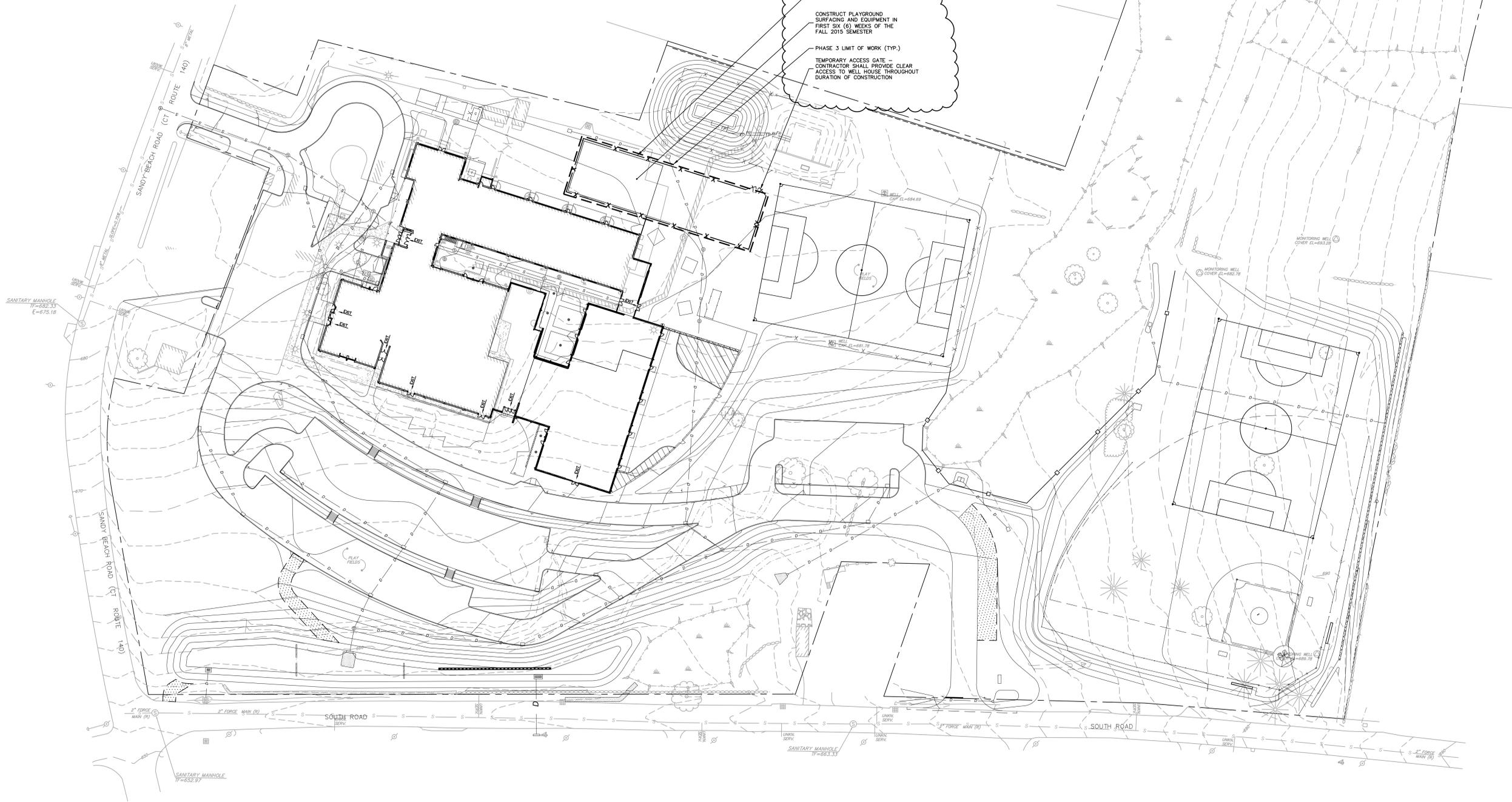
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JUNE 18, 2013
Scale:
1" = 40'
Drawn By:
WGW
Project Number:
12.140
Drawing Number:
C-701



- NOTES:**
1. CONSTRUCTION SCHEDULE: SEPTEMBER 2015 - AUGUST 2016.
 2. EARTHWORK: BULK EARTHWORK AND GRADING NECESSARY FOR THE AREA ASSOCIATED WITH THIS PHASE WILL HAVE BEEN COMPLETED IN PHASE 1.
 3. SCHOOL SITE OPERATIONS: ALL SITE AMENITIES WILL BE AVAILABLE EXCEPT THE PLAY AREAS. FINAL CURB CUTS, CIRCULATION, AND PARKING WILL BE IN PLACE. THE BITUMINOUS EVENT PARKING AREA OR ANY OF THE FIELDS COULD BE USED BY THE CHILDREN FOR RECREATION, ALTHOUGH A SAFE PATH AROUND THE PHASE 4 CONSTRUCTION AREA WILL NEED TO BE PROVIDED FOR ACCESS TO THE FIELDS. IT IS ANTICIPATED THAT THIS PHASE WILL TAKE PLACE DURING THE SUMMER SO IF IT IS AN ISSUE IT SHOULD ONLY BE FOR THE LAST FEW WEEKS OF THE SCHOOL YEAR IN JUNE 2015.
 4. CONSTRUCTION SITE OPERATIONS: BY THIS POINT THE MAJORITY OF THE SITE WORK WILL BE COMPLETE AND THERE SHOULD BE ONLY MINIMAL AREA REQUIRED FOR A SITE TRAILER AND LAY DOWN AREA. THIS PHASE WOULD CONSIST OF CONSTRUCTION OF THE PLAY AREAS, INCLUDING PLAYGROUNDS.
 5. UTILITIES: MINIMAL UTILITIES WILL BE REQUIRED FOR THIS PHASE.
 6. PHASING PLANS ARE CONCEPTUAL IN NATURE AND HAVE BEEN INCLUDED TO SHOW THE GENERAL INTENT AND SEQUENCE OF CONSTRUCTION AREAS. CONTRACTOR(S) SHALL PROVIDE DETAILED PHASING SCHEDULES AND SITE STAGING DIAGRAMS AS REQUIRED BY LOCAL OFFICIALS PRIOR TO STARTING WORK IN EACH CONSTRUCTION PHASE.

- LEGEND**
- - - - - PHASE LIMIT OF WORK
 - - - - - TEMPORARY CONSTRUCTION
 - - - - - PROPERTY LINE

- PHASE 3 TEMPORARY CONSTRUCTION FENCE (TYP.)**
- CONSTRUCT PLAYGROUND SURFACING AND EQUIPMENT IN FIRST SIX (6) WEEKS OF THE FALL 2015 SEMESTER**
- PHASE 3 LIMIT OF WORK (TYP.)**
- TEMPORARY ACCESS GATE - CONTRACTOR SHALL PROVIDE CLEAR ACCESS TO WELL HOUSE THROUGHOUT DURATION OF CONSTRUCTION**



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 Suite 103
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 860 652 8227

Project Title:
 Expansion and Renovate as New Project - PHASE 1 of 3
Crystal Lake Elementary School
 284 Sandy Beach Road
 Ellington, Connecticut 06029

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Revision:	Description:	Date:	Revised By:
--	ISSUED FOR BIDDING	NOV 26, 2013	--
△	ADDENDUM #1	DEC 5, 2013	WGW

Drawing Title:
Phasing Plan - Site Construction Phase Three
 State Project Number 048-0058 EA/RR/PS

Date:
 JUNE 18, 2013

Scale:
 1" = 40'

Drawn By:
 WGW

Project Number:
 12.140

C-702