NEW YORK STATE OF OPPORTUNITY. | Office of General Services | Design & Construction

ADDENDUM NO. 5 TO PROJECT NO. 43153

CONSTRUCTION WORK, MECHANICAL WORK, PLUMBING WORK, ELECTRICAL WORK PROVIDE VISITOR CENTER BUILDING AND SITE IMPROVEMENTS FIVE RIVERS ENVIRONMENTAL EDUCTION CENTER 56 GAME FARM ROAD DELMAR, NY 12054

July 9, 2015

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

PROJECT MANUAL – SPECIFICATIONS

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP
(Project Manual 43153-C, H, P, and E)

1. Specification Section 003132, add Soil Borings Report to end of specification section.

SPECIFICATIONS GROUP
(Project Manual 43153-C, H, P, and E)

1. Page 018119 – 2, Revise paragraph 1.05 A to read: “The C-Contractor shall prepare and submit a Construction IAQ Management Plan, after coordination with other Prime Contractors, to the Director’s Representative for approval. All Prime Contractor’s shall be responsible for following the parameters of the IAQ plan and this specification section. The Construction IAQ Management Plan shall meet the following criteria:”

FACILITY CONSTRUCTION SUBGROUP
(Project Manual 43153-C)

1. Page 022000 – 1, Paragraph 1.1 C, revise item 5 to read: “Excavation and backfill required for the work of each contract shall be the work of that contract. Each Contractor shall be responsible for complying with specifications regarding bedding and backfill, including testing.”

2. Page 062013 – 7, Paragraph 3.5 B, add item #3 to state: “Concealed siding clips shall be spaced a maximum of 16” oc.”

3. Replace Specification Section 075563 “Vegetated Roof Assemblies”

4. Add Specification Section 081113 “Custom Steel Doors and Frames”

5. Page 084113, Paragraph 2.5, revise item 1 to read: “Door Construction: Thermally broken entrance framing, 2-1/4” overall thickness, with a minimum 0.125 inch thick, extruded aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods. Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.”

6. Replace Specification Section 087100 “Finish Hardware”

7. Page 095429 – 3, Paragraph 2.1 H, add item #2 to state: “Black acoustical blanket shall run between ceiling framing members, paint visible portion of framing members black.”

CONSTRUCTION WORK DRAWINGS
[Contract: 43153-C]

1. Sheet C-110 Layout Plan Overall

    a. Paths I1, I2, H2, H3, and F shall be constructed using stone dust.

2. Sheet FS-100 Foundation Plan

    a. Replace sheet FS-100

3. Sheet FS-301 Foundation Sections II

    a. Add sheet FS-301

4. Sheet S-600 Typ. Superstructure Details & Notes

    a. Add columns C.7/6, C.7/7, C.7/8 to column schedule, columns shall be 12” diameter.

5. Sheet S-601 Typ. Superstructure Details & Notes

    a. Detail 1: Add note for angles shown but not labeled at top of shear wall to read: “L 4x4x1/4” AT EACH STUD, BOTH SIDES OF WALL.” Delete reference to SP6 at each stud.

6. Sheet A-602: Typ. Superstructure Details & Notes II

    a. Add detail 16/S-602

7. Sheet A-101 General Notes and Basement Plan

    a. Replace sheet A-101

8. Sheet A-103 Reflected Ceiling Plan

    a. Add note RCP8. under Reflected Ceiling Plan Notes to read: “Plywood ceiling framing shall be spaced a maximum of 16” OC unless noted otherwise.”

    b. Add note RCP9 under Reflected Ceiling Plan Notes to read: “Conduit for track lighting shall run concealed above wood grille ceiling. Conduit will be allowed to penetrate glulam beams, however not less than 2-1/2” from T/Beam. Any and all penetrations through glulam beams shall be located and sized on coordination drawings for review and approval by structural engineer. All holes drilled in wood structure shall be clean, neat, and precise without tearing or otherwise damaging surrounding material.”

9. Sheet A-104 Roof Plan

    a. Replace sheet A-104

10. Sheet A-301 Building Sections

    a. Plywood shall run to deck at wood grille ceilings as indicated in Contract Documents. Plywood and furring walls will be allowed to run to a minimum 8” above ceiling at plywood ceilings, however at walls called to receive acoustical batt insulation, the insulation shall still be required to run to B/Deck.

11. Sheet A-501 Exterior Details

    a. Black locust nailer/subfascia shall run at underside of SIPs roof deck at full perimeter of building as shown on sheet A-502 Exterior Details.
    b. In lieu of ½” cement board, provide the following:
        - 0.0625” aluminum flat stock with factory applied, 2-coat, fluoropolymer paint finish equivalent to AAMA 2605. Color is to be selected from a minimum of 24 manufacturer’s standard colors.
        - Aluminum shall be applied to foundation insulation and extend from above the siding starter clip to a minimum of 4” below grade.
        - Provide tight seams and the longest possible pieces (Utilize 10’ sheets)

PLUMBING WORK DRAWINGS
[Contract: 43153-P]

1. Sheet FP-101 Sprinkler Piping Layout Above Ground

    a. Revise note:
    "Pipe sprinkler main through glulam beam at vertical centerline of glulam beam (typ at each glulam beam)"

    To read:
    "Pipe wet sprinkler main through glulam beam at vertical centerline of glulam beam, pipe dry sprinkler main through middle third of glulam beam to allow for code required pitch (typical at each glulam beam). Any and all penetrations through glulam beams shall be located and sized on coordination drawings for review and approval by structural engineer. All holes drilled in wood structure shall be clean, neat, and precise without tearing or otherwise damaging surrounding material."

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

SECTION 075563

VEGETATED ROOF ASSEMBLIES

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. Continuous vegetated roof assemblies.

B. Related Sections:

1. Section 075323 "Ethylene-propylene-diene-monomer (EPDM) Roofing" for membrane roofing, roof insulation, and membrane roofing warranty.

1.3 DEFINITIONS

A. Captured Water: Water that is retained in the drainage layer of a vegetated roof assembly after new water additions have ceased and that cannot escape the roof except through evaporation or plant transpiration.

B. Finish Elevation: Elevation of finished growing-media surface of planting area.

C. Planting Area: Areas to be planted.

D. Plant, Plants, Plant Material: Vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

E. Growing Medium: Manufactured, lightweight soil mixture that promotes good growing conditions for specific varieties of plants.

1.4 ACTION SUBMITTALS

A. Product Data: For each vegetated roof assembly and each component, including each growing medium.

B. LEED Submittals:

1. Product Data for Credit MR 4: 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: For vegetated roof assembly. Include roof plans, slopes, and drain locations; details of vegetated roof assembly and accessories; depth of growing media; and attachments to other work.

D. Samples for Verification: For each of the following components of vegetated roof assembly:

1. Preplanted Vegetative Mat: 12 by 12 inches (300 by 300 mm).
2. Growing Media: 1-pint (0.5-liter) volume of each growing medium, in sealed plastic bags labeled with content and source. Each Sample shall be typical of the lots of growing media to be furnished. Provide an accurate representation of texture and composition.
3. Moisture-Retention Mat: 12 by 12 inches (300 by 300 mm).
4. Molded-Sheet Drainage Panels: 12 by 12 inches (300 by 300 mm).
5. Protection Fabric: 12 by 12 inches (300 by 300 mm).
6. Root Barrier: 12 by 12 inches (300 by 300 mm).
7. Separation Geotextile: 12 by 12 inches (300 by 300 mm).
8. Soil Retainer: Manufacturer's standard size to verify configuration and color selected.
9. Gravel/Drainage Stone: Cubic foot

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory, according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Product Test Reports: For each growing medium, including complete analysis demonstrating compliance with specified requirements.

D. Field quality-control reports.

E. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended maintenance plan including procedures for inspection and care of vegetated roof assembly and plants during a calendar year. Submit before start of required warranty and maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified vegetated roof assembly Installer, approved, authorized, or licensed by membrane roofing manufacturer, whose work has resulted in successful establishment of vegetated roofs.

1. Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

B. Source Limitations: Obtain vegetated roof assembly components, growing medium and accessories from single source from single manufacturer.

1. Preplanted vegetative mat may be obtained from other than single source manufacturer but shall be guaranteed by single source manufacturer.

C. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials on or near structures, utilities, walkways and pavements, or existing roof areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of debris-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with product certificates.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTIES

A. Special Warranty for Vegetated Roof Assembly: Installer agrees to repair or replace vegetated roof assembly and components that fail in materials or workmanship within specified warranty period.

1. Failure includes, but is not limited to, ponding water or prolonged wetness of growing medium caused as a result of failure of the assembly to properly drain.
2. Warranty Period: 10 years from date of Substantial Completion.

B. Special Warranty for Plant Growth: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Foliage Cover: Planted materials shall grow to achieve and maintain at least 80 percent foliage cover over planting area commencing 24 months after planting, through the duration of this warranty.
2. Failures include, but are not limited to, death and unsatisfactory growth except for defects resulting from abuse, lack of adequate maintenance, neglect by Owner, or incidents that are beyond Contractor's control.
3. Warranty Period: Two years from Date of Substantial Completion:

4. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.

5. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.11 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide maintenance by skilled employees of vegetated roof assembly Installer approved by membrane roofing manufacturer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than the following maintenance period:

1. Maintenance Period: 24 months from date of Planting Completion.

PART 2 - PRODUCTS

2.1 VEGETATED ROOF ASSEMBLY COMPONENTS

A. Moisture-Retention and Drainage Products:

1. Moisture-Retention Mat: Manufacturer's standard water-retaining fabric manufactured from synthetic fibers.
2. Molded-Sheet Drainage Panels: Manufacturer's standard drainage board formed from geotextile-faced, molded-plastic sheet with a geotextile face and "cups" of the molded sheet facing upward like small reservoirs to retain water while allowing excess water to drain away below the board.
3. Protection Fabric: Manufacturer's standard protection fabric.
4. Separation Geotextile: Manufacturer’s standard separation geotextile.

B. Root Barrier: See Section “075323 "Ethylene-propylene-diene-monomer (EPDM) Roofing"

C. Anti-Slip Devices: Manufacturer's standard anti-slip devices.

D. Vegetated Roof Assembly Anchor Angle: See sheet A-104 for additional information on stainless steel angle and tube required to brace slope-stabilization mesh.

E. Recycled Content: Provide moisture-retention mat, molded-sheet drainage panels, protection fabric, and separation geotextile material with recycled content so postconsumer recycled content plus one-half of preconsumer recycled content not less than 100 percent by weight.

2.2 VEGETATED ROOF ASSEMBLIES

A. Continuous Vegetated Roof Assembly: Continuous-coverage assembly consisting of manufacturer's standard vegetated roof assembly components for installation over membrane roofing.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Conservation Technology, Drainage Plate P1 System and Drainage Mat M1 System or comparable product.

2. Assembly Depth, Nominal: 4 inches (100 mm), including growing medium.
3. Assembly Weight: Maximum 21 lb/sq. ft., including growing medium and plants and saturated with captured water, but not including weight of roofing system.
4. Plantings: Preplanted vegetative mat as selected by Architect from manufacturer's standard mixes.

    a. Basis-of-Design Product: Subject to compliance with requirements, provide Sempergreen Sedummix Blanket or comparable product.

2.3 MANUFACTURED GROWING MEDIA

A. Growing Medium: Vegetated roof assembly manufacturer's lightweight, manufactured soil mixture designed for plants indicated.

2.4 ACCESSORIES

A. Soil Retainer: Assembly manufacturer's extruded-aluminum edging with drainage openings.

1. Configuration: L-shaped.
2. Color: Mill-finish metal.
3. Method of Attachment: Manufacturer's standard adhesive compatible with the membrane roofing.

2.5 DRAINAGE STONE (GRAVEL)

A. Drainage Stone: Provide minimum 3/4", maximum 2" sieve, screened, washed, round river bed stone. No shale or similar layered, deleterious material shall be accepted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine each area to receive vegetated roof assembly for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Verify that roof insulation over membrane roofing is in place, secure, and flush along all seams.
2. Verify that perimeter and other flashings are in place and secure along entire lengths where they will be covered by vegetated roof assembly.

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

C. Inspect growing medium. If growing medium is contaminated by foreign or deleterious material or liquid, remove growing medium and contamination and replace with new growing medium.

3.2 PREPARATION

A. General: Protect structures, utilities, sidewalks, pavements, and other facilities and areas from damage caused by installation.

B. Protection Course: Cover membrane roofing with protection board with butted and fully taped joints before membrane roofing is subject to vegetated roof assembly installation work.

3.3 INSTALLATION, GENERAL

A. Install vegetated roof assembly according to manufacturer's written instructions.

B. Sloped Roofs: Install anti-slip devices for slopes steeper than 2 inches per 12 inches (2:12) according to manufacturer's written instructions.

3.4 PLANTING

A. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in growing medium within a planting area.

B. Do not mix or place growing medium during frozen, wet, or muddy conditions.

C. Suspend spreading, grading, and planting operations during periods of excessive moisture until the moisture content in growing medium reaches acceptable levels to attain the required results.

D. Uniformly moisten an excessively dry growing medium that is too dusty or not workable.

E. Preplanted Vegetative Mat: Install in full contact with growing medium and secure in position.

3.5 SOIL-RETAINER INSTALLATION

A. Install soil retainer where indicated according to manufacturer's written instructions. Secure with adhesive.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage membrane roofing manufacturer's authorized service representative to provide inspection of vegetated roof assembly installation and prepare inspection reports.

B. Correct deficiencies in work that do not comply with requirements.

3.7 PLANT MAINTENANCE

A. General: During maintenance period, maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing devices, resetting plants to proper elevations or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Replace growing medium that becomes displaced or eroded because of settling or other processes.

C. Apply treatments as required to keep plant materials, planted areas, and growing medium free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. Use only products and methods acceptable to membrane roofing manufacturer.

3.8 CLEANING AND PROTECTION

A. During planting and maintenance, keep adjacent areas and construction clean and maintain work area in an orderly condition.

B. Protect vegetated roof assemblies from damage due to planting operations and operations of other contractors and trades. Repair or replace damaged vegetated roof assemblies.

END OF SECTION 329500

SECTION 081113

CUSTOM STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Custom steel doors and frames.

B. Related Sections:

1. Division 08 Section "Door Hardware" for door hardware for hollow metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Custom steel doors and frames: Steel doors and frames fabricated according to ANSI/NAAMM-HMMA 861.

C. Steel Frames are also commonly referred to as “hollow metal” frames.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door design.
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.

C. Samples for Verification:

1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm).
2. For the following items, prepared on Samples about 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:

   a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
   b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow metal panels and glazing if applicable.

D. Other Action Submittals:

1. Schedule: Provide a schedule of steel doors and frames work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain steel doors and frames from single source from single manufacturer.

B. Manufacturer's Qualifications: A firm experienced in manufacturing custom steel doors and frames similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Installer Qualifications: An employer of workers trained and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver steel doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.

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

C. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.

D. Store steel doors and frames under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

A. Coordinate installation of anchorages 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.

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. Curries Company; an Assa Abloy Group company.
2. Ceco Door Products; an Assa Abloy Group company.
3. Steelcraft; an Ingersoll-Rand company.

2.2 MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) metallic coating.

B. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

D. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Minimum density of 1.5 lb/cu. Ft., thermal resistivity of 6.2 deg F x h xsq. Ft./Btu x in. at 75 deg F.

E. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 CUSTOM STEEL DOORS

A. General: Provide doors not less than 1-3/4 inches (44.5 mm) thick, of seamless hollow construction unless otherwise indicated. Construct doors with smooth surfaces without visible joints or seams on exposed faces. Comply with ANSI/NAAMM-HMMA 861 unless otherwise indicated in the Construction Documents.

B. Exterior Doors: All steel for exterior door construction to be galvanized.

C. Exterior Door Face Sheets: Fabricated from metallic-coated steel sheet, minimum 0.059 inch (16 ga) thick.

D. Core Construction: Provide thermal-resistance-rated cores for exterior doors.

1. Steel-Stiffened Core: 0.026-inch- (0.7-mm-) thick, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart, spot welded to face sheets a maximum of 5 inches (127 mm) o.c. Spaces filled between stiffeners with glass- or mineral-fiber insulation.

    a. Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance value (R-value) of not less than 6.0 deg F x h x sq. ft./Btu (1.057 K x sq. m/W) when tested according to ASTM C 1363.

E. Vertical Edges for Single-Acting Doors: Beveled 1/8 inch in 2 inches (3 mm in 50 mm).

F. Top and Bottom Channels: Closed with continuous channels, minimum 0.053 inch (1.3 mm) thick, of same material as face sheets and spot welded to both face sheets.

1. Reinforce tops and bottoms of doors with inverted horizontal channels of same material as face sheet so flanges of channels are even with bottom and top edges of face sheets.
2. For exterior doors, close bottom edge with metallic-coated steel closing channel and top edge with filler channel of same material, so webs of channels are flush with bottom and top door edges.

G. Hardware Reinforcement: Fabricate according to ANSI/NAAMM-HMMA 861 with reinforcing plates from same material as door face sheets.

1. Length of hinge and pivot reinforcement to be no less than 6-inches longer than hinge, secured by no less than 6 spot welds.

2.4 CUSTOM STEEL FRAMES

A. General: Fabricate frames of construction indicated. Close contact edges of corner joints tight with faces mitered and stops butted or mitered. Continuously weld faces and soffits and finish faces smooth. Comply with ANSI/NAAMM-HMMA 861 unless otherwise indicated in the Construction Documents.

1. Fabricate frames of full welded unit construction, with corners mitered, reinforced and continuously welded full depth and width of frame.

    a. Knockdown frames will not be accepted.

2. Door Frames for Openings 48 Inches (1219 mm) Wide or Less: Fabricated from 0.075-inch- (14 ga.) thick steel sheet.
3. Door Frames for Openings More Than 48 Inches (1219 mm) Wide: Fabricated from 0.1046-inch- (12 ga.) thick steel sheet.

B. Exterior Frames: All exterior frames shall be hot dipped galvanized and of thermal break construction.

1. Basis of Design Thermal Break Frames: Thermally broken frames shall be double rabbet type, made up of two separate frame sections which are joined together with a custom PVC thermal barrier with no exposed fasteners; Series SQT/SRT Thermal Break Frames by Ceco Door products, an Assa Abloy Group company, or a comparable product by one of the following:

    a. Curries Company; an Assa Abloy Group company.
    b. Steelcraft; an Ingersoll-Rand company.
    c. Fleming Steel Doors and Frames, a United Dominion Company

C. Hardware Reinforcement: Fabricate according to ANSI/NAAMM-HMMA 861 with reinforcing plates from same material as frame.

1. Hinges and Pivots: 0.1345 inch (10 ga) minimum thick by 1-1/2 inches (38 mm) wide by 6 inches (150 mm) longer than hinge, secured by not less than 6 spot welds, for doors 3’-0” wide or less. 0.1644 inch (8 ga) minimum thick by 1-1/2 inches (38 mm) wide by 6 inches (150 mm) longer than hinge, secured by not less than 6 spot welds, for doors greater than 3’-0” in width.
2. Strikes, Flush Bolts, and Closers: 0.1046 inch (12 ga).
3. Surface-Mounted Hold-Open Arms and Panic Devices: 0.1046 inch (12 ga).
4. All other Hardware: 0.1046 inch (12 ga).
5. Coordinate with Owner’s Representative reinforcement, cutout and other requirements at doors to receive cared access hardware as required to properly coordinate with and receive Owner supplied and installed security equipment.

D. Head Reinforcement: Provide minimum 0.093-inch- (2.3-mm-) thick, steel channel or angle stiffener for opening widths more than 48 inches (1219 mm).

2.5 FRAME ANCHORS

A. General: Provide Frame Anchors in compliance with ANSI/NAAMM-HMMA 861, unless otherwise indicated in the Contract Documents.

B. Jamb Anchors:

1. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) 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.

C. Floor Anchors: Formed from same material as frames, not less than 0.075 inch (14 ga) thick, at each jamb and mullion that extends to the floor, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

D. Head Anchors: Provide 2 head anchors for frames more than 42 inches (1066 mm) wide and mounted in steel-stud walls.

2.6 STOPS AND MOLDINGS

A. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

2.7 FABRICATION

A. Fabricate steel doors and frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. 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.

1. Weld exposed joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

B. Tolerances: Fabricate steel doors and frames to tolerances indicated in ANSI/NAAMM-HMMA 861.

C. Steel Doors:

1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

D. Steel 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. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
4. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

5. Door Silencers: Except on weather-stripped doors, 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 door silencers.

E. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.

F. Hardware Preparation: Factory prepare steel doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/NAAMM-HMMA 861.
2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of steel doors and frames for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.8 STEEL FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for cleaning, treating, priming, and when specified, finishing.

2.9 METALLIC COATED STEEL FINISHES

A. All hot-dipped galvanizing shall be factory coating. There shall be no cutting, drilling, or otherwise damaging of factory hot-dipped galvanized coating.

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. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

1. Commencement of installation shall indicate acceptance of all existing and substrate conditions.

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. Prior to installation, adjust and securely brace welded steel frames for squareness, alignment, twist, and plumbness to the following tolerances:

1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

3.3 INSTALLATION

A. General: Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Steel Frames: Install steel frames of size and profile indicated. Comply with HMMA 840.

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. Install door silencers in frames before grouting.
    b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    c. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    d. Field apply bituminous coating to backs of frames that are 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 powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Concrete Walls: Solidly fill space between frames and concrete with spray-applied closed-cell polyurethane foam insulation. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by insulation expansion forces.
4. 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 (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Steel Doors: Fit hollow steel accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

    a. Jambs and Head: 3/32 inch plus or minus 1/16 inch (1.6 mm).
    b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    c. Between Bottom of Door and Top of Threshold or Carpet: Maximum 1/8 inch.
    d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/8 inch.

3.4 ADJUSTING AND CLEANING

A. Protect doors and frames during construction, in a manner suitable to the Installer, which ensures doors and frames being without damage or deterioration at the time of Substantial Completion. Repair or replace damaged or marred materials at no cost to the Owner.

B. 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 steel doors and frames that is warped, bowed, or otherwise unacceptable.

C. Remove grout and other bonding material from steel doors and frames immediately after installation.

D. 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.

E. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

F. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

END OF SECTION 081113

SECTION 087100

FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules.

C. Types of finish hardware required include the following:

Butt Hinges
Continuous Hinges
Lock cylinders and keys
Lock and latch sets
Exit devices
Closers
Electronic door control devices
Overhead Holders
Door trim units

1.3 RELATED SECTIONS

A. Division 08 – Custom Steel Doors and Frames

B. Division 08 - Wood Doors.

C. Division 08 - Aluminum-Framed Entrances and Storefronts.

1.4 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (latch and lock sets, etc.) from a single manufacturer.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or

who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.

C. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors with labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide labels on exit devices indicating "Fire Exit Hardware

D. This supplier shall be responsible to field check existing openings for proper application of sizes and strikes for all openings.

E. Hardware Supplier: Shall be an established firm dealing in contract builders' hardware. He must have adequate inventory, qualified personnel on staff and be located within 100 miles of the project. The distributor must be a factory-authorized dealer for all materials required. The supplier shall be or have in employment an Architectural Hardware Consultant (AHC).

1.5 REGULATORY REQUIREMENTS

A. Comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, FED-STD-795, "Uniform Federal Accessibility Standards."

B. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or an approved testing agency for types and sizes of doors required and complies with requirements of door and door frame labels.

C. Fire-Rated Assemblies: Upon completion of the installation, all fire door assemblies shall be tested to confirm proper operation of the closing device and that it meets all criteria of a fire door assembly as per NFPA 80 2007 Edition. At completion of the project, written record shall be furnished by the door hardware supplier and given to the owner to be made available to the Authority Having Jurisdiction, "AHJ". The record shall show all fire rated openings, door number and location, along with hardware supplied and installed for the opening. The inspection of the fire doors that are swinging doors with builders hardware type to be performed by individuals with knowledge and understanding of the operating components of the type of door being subjected to testing as required by the AHJ.

1.6 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit final hardware schedule in a vertical format as recognized by the Door and Hardware Institute (DHI). Horizontal schedule format will not be accepted. Coordinate

hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

    a. Type, style, function, size and finish of each hardware item.
    b. Name and manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Index to include location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
    e. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
    f. Mounting locations for hardware.
    g. Door and frame sizes and materials.
    h. Keying information.
    i. Wiring diagrams with theory of operation.

C. Submittal Sequence: Submit schedule in accordance to Division 1, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

D. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

E. Samples if Requested: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finish as required, and tagged with full description for coordination with schedule.

F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

G. Submit to General Contractor/Construction Manager, the factory order acknowledgement numbers for the various hardware items to be used on the project. The factory order acknowledgement numbers shall help to facilitate and expedite any service or warranty issues that may be required on a particular hardware item. General Contractor/Construction Manager shall keep these order acknowledgement numbers on file in the construction trailer.

1.7 PRODUCT HANDLING

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

D. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

2.1 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

B. Manufacturer's Product Designations:

Butt Hinges:	Ives
Continuous Hinges:	Ives
Locksets:	Falcon Lock Co.
Exit Devices:	Falcon Exit Devices
Closers:	LCN
Overhead Holders:	Glynn-Johnson
Kickplates:	Ives
Silencers:	Ives
Floor/Wall Stops:	Ives
Threshold & Weatherstrip	National Guard Products

2.2 MATERIALS AND FABRICATION

A. General:

1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
3. Manufacturer's identification will be permitted on rim of lock cylinders only.
4. Finish: All hardware finish shall match US26D unless otherwise indicated. Closer bodies, covers and arms shall be powder coated finish.
5. Lockset Design: Lever handle design shall be similar to “SUTRO” as manufactured by Falcon Lock Co.

6. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
7. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
8. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
9. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.3 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

1. Steel Hinges: Steel pins.
2. Non-ferrous Hinges: Stainless steel pins.
3. Out-swing Corridor Doors: Non-removable pins.
4. Interior Doors: Non-rising pins.
5. Tips: Flat button and matching plug, finished to match leaves.
6. Number of hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

D. Acceptable Manufacturers:

1. Ives
2. McKinney
3. Hager

E. Supplier shall be responsible for the correct hinge size to fit any existing frames or doors.

F. Furnish hinges in sizes and types as required by architect’s details to achieve maximum degree of opening.

2.4 CONTINUOUS HINGES

A. Hinge shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising. The door leaf and jamb leaf shall be geared together for the entire length of the hinge and joined by a channel. Hinge knuckle shall be monolithic in appearance. Continuous hinge with visible knuckle separations are not acceptable. Vertical door loads shall be carried on minimum 3/4" acetal bearings through a full 180 degrees. The door leaf and jamb leaf shall have templated screw hole locations for future replacement needs. All heavy duty hinges (HD) shall have a minimum of 32 bearings for a 7' length.

B. Acceptable Manufacturers:

1. Ives
2. Select Products
3. Hager Roton

2.5 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster). If key pinning charts are required, owner to furnish charts to hardware supplier.

C. Furnish keyed temporary cores for the construction period. Remove the construction cores and install the permanent cores when directed. Contractor shall install the permanent cores in the presence of the owner’s representative. Construction cores remain the property of the hardware supplier.

D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

E. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

F. Permanently inscribe each key and cylinder with Visual Key Control that identifies cylinder manufacturer key symbol, and inscribe key with the notation "DO NOT DUPLICATE".

G. Key Material: Provide keys of nickel silver only.

H. Key Quantity:

1. Furnish 3 change keys for each lock.
2. 5 master keys for each master system.
3. 5 grandmaster keys for each grandmaster system.
4. One extra blank for each lock.
5. 6 Construction master keys.

6. 6 Control Keys – Construction and Permanent

I. Deliver keys as directed by the owner.

J. Key Control System: Provide a key control system including envelopes, labels tags with self locking clips, receipt forms, 3-way visible card index, and standard metal cabinet, with a capacity for 150% of the number of locks required for this project.

1. Key cabinet and system shall be provided as a part of this contract by the hardware supplier. Cabinet shall be indexed and set up by supplier with the owner's representative.

2.6 LOCKS, LATCHES AND BOLTS

A. Locks shall meet these certifications:

1. Mortise Locks – ANSI A156.13, 1994, Grade 1 Operational, ANSI/ASTM F476-76 Grade 30, UL listed. Levers shall be forged brass or bronze, cast stainless steel, KG lever design is wrought brass, bronze or stainless steel. Meets A117.1 Accessibility Codes. Steel Case with ¾" throw brass or stainless steel anti-friction latchbolt and a 1" throw brass or stainless steel deadbolt. Lock trim shall incorporate individual lever support springs in each rose or escutcheon. Lever connection by attaching threaded bushings tightened by a spanner wrench. Threaded set screws will not be accepted. Lock spindles shall be two independent inside and outside spindles to prevent manipulation of lock. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame.

a. Lock design shall be Falcon "MA" series "SG" design – Finish to be 626.

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B. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

C. Lock Manufacturers: Subject to compliance with requirements, provide lockset products of the following approved manufacturers:

1. Falcon Lock Co. "MA Series"
2. Sargent Lock Co. "8200 Line"
3. Corbin Russwin "ML2200 Series"
4. Schlage Lock Co. "L9000 Series"

2.7 CLOSERS AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. All closers shall be inspected after installation by a factory representative to ensure proper adjustment and operation. A report shall be filed with the architect

after said visit has been made. Closer shall carry a manufacturer's TEN YEAR WARRANTY for hydraulic units and 2 year warranty for electrical and/or handicap power assist door closers against manufacturing defects and workmanship.

C. Cylinder: Shall be of high strength cast iron construction. All door exterior closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified independent testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles for all door closers must be provided.

D. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16" and piston diameter of 1-1/2". Closer shall utilize full complement bearings at shaft. Pinion and pistons shall be hardened regardless of closer size. The closer shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging. Closer shall have separate and independent screw valve adjustments for latch speed, general speed and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location.

E. Pressure relief valves are not acceptable.

F. All door closers shall pass UL10C positive pressure fire test.

G. Parallel Arm Closers: Shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16" x 1/2" steel stud shoulder bolts, shall be incorporated in regular arms, hold open arms, arms with stop built in, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, and durability.

H. Built-In Stops: Where closers with built-in positive stops are used, the stops shall be of one piece cast malleable iron material. Screw on stops of any kind are not acceptable. Where required, the hold-open assembly handle for these stops shall rotate on ball bearings.

I. All closers to have a powder coat finish on closer body, arm, metal cover and adapter plate. Powder coat finish shall exceed a minimum 100 hour salt spray test, as described in ANSI Standard A156.4 and ASTM B117.

J. Hydraulic Fluid: All closers, with the exception of interior and interior electronic closers, shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees F. to -30F. without requiring seasonal adjustment of closer speed to properly close the door.

K. Supply all drop plates, shoe supports, spacers, templates, etc. to properly install closers according to manufacturer's recommendations.

L. Provide grey resilient parts for exposed bumpers.

M. Closer being submitted for approval shall have been manufactured for at least 10 years. A list of (10) year old projects using submitted closer shall be available upon request.

N. Closer Manufacturers: Subject to compliance with compliance with requirements, provide closer products of the following approved manufacturers:

1. LCN Closers - 4010 / 4110 Series
2. Sargent – 280 Series (less PRV)

2.8 EXIT DEVICES

A. General: All devices shall be of one manufacturer to provide for proper installation and serving. Devices shall be non handed and capable of direct field conversion for all available trim functions. All devices shall carry a three year warranty against manufacturing defects and workmanship.

B. Furnish roller strikes for all exit devices.

C. All mounting fasteners to be concealed. Devices to be non-handed or field reversible.

D. Furnish stainless steel latchbolt with ¾" throw and security dead latching for all rim and surface vertical rod exit devices.

E. Furnish center case with heavy wrought and sintered parts and stamped cold roll steel chasis with a thickness of .090".

F. Device cover stainless steel, 0.048 thick or brass, 0.050" thick.

G. Furnish stainless steel or brass touch pad cover on all exit devices.

H. Mechanism housing extruded aluminum with 0.080" thickness and extruded cover with 0.152" thickness.

I. The end cap to be cast or forged material and is not to overlap the mechanism case.

J. No exposed rivets or screws on back of device that would be visible through glass light.

K. Where lever trim is specified, levers to match all locksets, latchsets, and privacy sets.

1. Escutcheons for all lever trim to be deep drawn stainless steel or brass with (4) thru-bolts anchoring trim assembly to exit device chassis. (25 series).
2. Escutcheons for all lever trim shall be roll formed stainless steel or brass with (4) thru-bolts anchoring trim assembly to exit device chassis. (24 series).
3. Levers to be brass, cast or forged.
4. Lever return springs to be compression type.
5. Protect lever trim by a shear pin, which will withstand a rotational force of 35 ft-lbs before shearing.
6. Vandal resistant trim shall conform to ANSI 156.3 Grade 1 Security Trim standard.

L. Pull type trim to be thru-bolted to panic device center case with minimum four number 10 machine screws and one ¼ x 20 machine screw..

M. Vertical rod devices to be UL, cUL labeled for fire door applications without the use of bottom rod assemblies or when bottom rods are required for security applications.

N. Fire exit devices mounted on labeled wood doors to be thru-bolt mounted in compliance with door manufacturer's requirements. Where special blocking has been specified in wood door specification, do not thru-bolt exit devices.

O. Acceptable Manufacturers and Types:

1. Falcon Exit Devices – "24 and 25 Series"
2. Sargent Exit Devices – "8000 Series"
3. Precision Hardware – "Apex Series"
4. Corbin Russwin – "ED4000 and ED5000 Series"

2.9 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated. All protection plates shall have all edges beveled (B4E).

C. Metal Plates: Stainless steel, .050" (U.S. 18 ga.).

D. All pull plates and handles to be thru-bolted. Install pull plate prior to push plate to conceal thru-bolts. Provide concealed fasteners for all push/pull applications.

E. Acceptable Manufacturers:

1. Ives
2. Rockwood
3. Quality

2.10 WEATHERSTRIP AND GASKETING

A. General: Except as otherwise indicated, provide continuous weather stripping at each leaf of every exterior door. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips is easily replaceable and readily available from stocks maintained by the manufacturer.

C. Acceptable Manufacturers:

1. Pemko Mfg. Co.
2. Reese
3. National Guard Co.

2.11 THRESHOLDS

A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or detailed.

B. Provide welded custom thresholds where scheduled and noted in the hardware sets. Provide cover plates where scheduled.

C. Provide thresholds that are 1" wider than depth of frame unless specified or detailed otherwise.
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D. Acceptable Manufacturers:

1. Pemko Mfg. Co.
2. Reese
3. National Guard Co.

2.12 DOOR SILENCERS

All hollow metal frames shall have grey resilent type silencers. Quantity (3) on single doors and quantity (2) on pairs of doors.

PART 3 - EXECUTION

3.1 HARDWARE SCHEDULE

Door No	HwSet	Door No	HwSet	Door No	HwSet
001.1	16				
100.1	13				
100.2	01				
100A.1	14				
100A.2	15				
100B.1	14				
100B.2	15				
100C.1	02				
100D.1	04				
100E.1	10				
101.1	07				
101.2	07				
102.1	05				
102.2	05				
102.3	11				
102A.1	05				
102A.2	05				
102A.3	12				

103.1	05				
103.2	13				
104.1	05				
104.2	17				
104A.1	02				
105.1	08				
106.1	08				
107B.1	10				
107C.1	18				
107C.2	04A				
108.1	06				
108A.1	04				
108B.1	03				
109.1	09				
110.1	09				
110.2	10				
111.1	03				

HW SET: 01

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	MA561HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	WALL STOP	WS406CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 02

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	ELECTRONIC LOCK	CO-200-MS-70-KP-TLR	626	SCE
1	EA	OVERHEAD STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 03

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	MA581HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	OVERHEAD STOP	100S	630	GLY
1	EA	WALL STOP	WS406CCV	630	IVE

3	EA	SILENCER	SR64	GRY	IVE

HW SET: 04

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	MA561HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	OVERHEAD STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 04A

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	ELECTRONIC LOCK	CO-200-MS-70-KP-TLR	626	SCE
1	EA	OVERHEAD STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 05

4	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	MA561HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	OVERHEAD STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 06

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	MA561HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	WALL STOP	WS406CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 07

4	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC DEVICE	25-R-L Sutro	26D	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL

1	EA	MORTISE CYLINDER	C987 W/ TEMP CONST CORE	626	FAL
1	EA	SURFACE CLOSER	4111 HCUSH MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 08

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8302-0 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4011 MC	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA	WALL STOP	WS406CCV	630	IVE
1	SET	SEALS	5050B	BRN	NGP

HW SET: 09

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRY/OFFICE LOCK	MA521HD SG	626	FAL
1	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	WALL STOP	WS406CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 10

1	SET	POCKET DOOR KIT	9850	AL	HAG
2	EA	FLUSH PULL	226B	626	IVE
1	EA	EDGE PULL	230B	626	IVE

HW SET: 11

1	SET	MULTI-PASS DOOR KIT	200MD	AL	JOH
6	EA	FLUSH PULL	226B	626	IVE

HW SET: 12

8	EA	WIDE THROW HINGE	WTBB1168 5 X 6 NRP	26D	HAG
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	MA581HD SG	626	FAL
1	EA	IC CORE ONLY,	C607	626	FAL

		KEYED			
1	EA	SURFACE CLOSER	4111 SCUSH MC	689	LCN
1	EA	OVERHEAD STOP	900S	630	GLY
2	EA	KICK PLATE	8400 10" X 1" LDW	630	IVE
1	SET	SEALS	137NA	CL	NGP
2	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	425	AL	NGP

PROVIDE LOCKSET AND CYLINDERS AS REQUIRED FOR DOOR THICKNESS. VERIFY DETAIL WITH ARCHITECT.

HW SET: 13

1	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PANIC DEVICE	CD-24-R-NL-OP	26D	FAL
2	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	RIM CYLINDER	C953 W/ TEMP CONST CORE	626	FAL
1	EA	MORTISE CYLINDER	C987 W/ TEMP CONST CORE	626	FAL
1	EA	DOOR PULLS	RM4150 X 20"	630	ROC
1	EA	SURFACE CLOSER	4111 EDA MC	689	LCN
1	EA	MOUNTING PLATE	4110-18PA	689	LCN
1	EA	MOUNTING PLATE	4110-61	689	LCN
1	EA	OVERHEAD STOP	100S	630	GLY
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	425	AL	NGP

WEATHERSTRIP BY FRAME SUPPLIER.

HW SET: 14

2	EA	CONTINUOUS HINGE	112HD	628	IVE
2	EA	DUMMY TOUCH BAR	250DT	26D	FAL
2	EA	DOOR PULLS	RM4150 X 20"	630	ROC
2	EA	SURFACE CLOSER	4111 EDA MC	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	MOUNTING PLATE	4110-61	689	LCN
2	EA	OVERHEAD STOP	100S	630	GLY
2	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	425	AL	NGP

WEATHERSTRIP AND WEATHERSTRIP ASTRAGAL BY DOOR AND FRAME SUPPLIER.

HW SET: 15

2	EA	CONTINUOUS HINGE	112HD	628	IVE
1	EA	PANIC DEVICE	CD-24-V-C-718C	26D	FAL
1	EA	PANIC DEVICE	CD-24-V-EO	26D	FAL

1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	MORTISE CYLINDER	26-091	626	SCH
3	EA	IC CORE ONLY, KEYED	C607	626	FAL
1	EA	RIM CYLINDER	C953 W/ TEMP CONST CORE	626	FAL
2	EA	MORTISE CYLINDER	C987 W/ TEMP CONST CORE	626	FAL
2	EA	DOOR PULLS	RM4150 X 20"	630	ROC
2	EA	SURFACE CLOSER	4111 EDA MC	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN
2	EA	MOUNTING PLATE	4110-61	689	LCN
2	EA	OVERHEAD STOP	100S	630	GLY
2	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	425	AL	NGP

WEATHERSTRIP AND WEATHERSTRIP ASTRAGAL BY DOOR AND FRAME SUPPLIER.

HW SET: 16

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	F-25-R-L-Sutro-SNB	630	FAL
1	EA	MORTISE CYLINDER	C987	626	FAL
1	EA	SFIC CORE	C607	626	FAL
1	EA	SURFACE CLOSER	4111 EDA MC	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406CCV	630	IVE
1	SET	SEALS	5050B	BRN	NGP
1	EA	THRESHOLD	425	AL	NGP

HW SET: 17

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PASSAGE SET	MA101 DG	626	FAL
1	EA	SFIC CORE	C607	626	FAL
1	EA	OH STOP	100S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

HW SET: 18

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE

1	EA	ELEC CLASSROOM LOCK	CO-200-MS-70-KP-TLR-PD	626	SCE
1	EA	SFIC CORE	C607	626	FAL
3	EA	SILENCER	SR64	GRY	IVE

MISCELLANEOUS HARDWARE TO BE PROVIDED:

1	EA	PROGRAMMING DEVICE	HHD	SCE
1	EA	KEY CABINET	1200	LUN
1	EA	AS-BUILT FIRE DOOR SCHEDULE	SCHEDULE TO COMPLY WITH NFPA 80 2007 EDITION, SPECIFICATION SECTION 08710 PART 1.5.C	
1	EA	MAINTENANCE EQUIPMENT	SPECIALIZED TOOLS AND MAINTENANCE INSTRUCTIONS	

3.2 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

F. Technical and Warranty Information:

1. At the completion of the project, the technical and warranty information coalesced and kept on file by the General Contractor/Construction Manager shall be given to the Owner or Owner’s Agent. In addition to both the technical and warranty information, all factory order acknowledgement numbers supplied to the General Contractor/Construction Manager during the construction period shall be given to the Owner or Owner’s Agent. The warranty information and factory order acknowledgement numbers shall serve to both expedite and properly execute any

warranty work that may be required on the various hardware items supplied on the project.

2. Submit to General Contractor/Construction Manager, two copies each of parts and service manuals and two each of any special installation or adjustment tools. Include for locksets, exit devices, door closers and any electrical products.

3.3 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

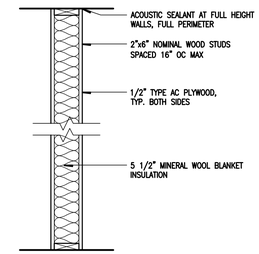
C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

END OF SECTION 087100

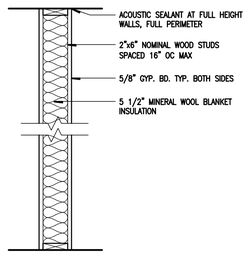
INTERIOR PARTITION TYPE REFERENCE DETAILS



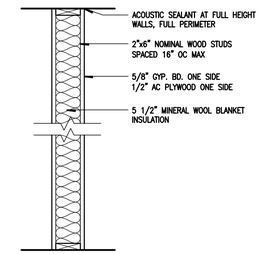
S50 TYPICAL INTERIOR PARTITION PLYWOOD ON 2x6 WOOD STUD WALL

S56 SIMILAR TO WALL TYPE S50 EXCEPT PROVIDE 2x10 WOOD STUD WALL

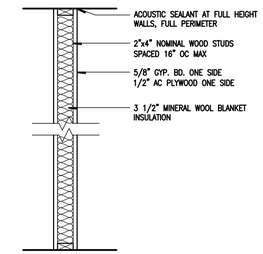
S57 SIMILAR TO WALL TYPE S50 EXCEPT PROVIDE 2x8 WOOD STUD WALL



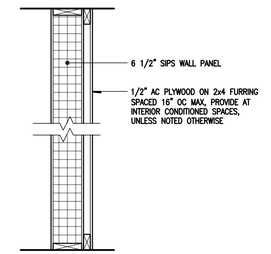
S51 GYPSUM BOARD ON 2x6 WOOD STUD WALL



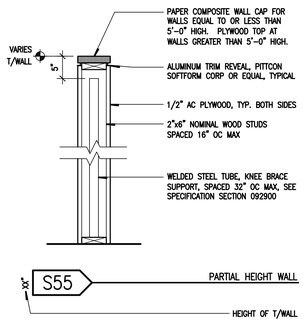
S52 GYPSUM BOARD (TAG SIDE) AND PLYWOOD OPPOSITE SIDE ON 2x6 WOOD STUD WALL



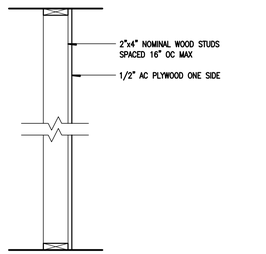
S53 GYPSUM BOARD (TAG SIDE) AND PLYWOOD OPPOSITE SIDE ON 2x4 WOOD STUD WALL



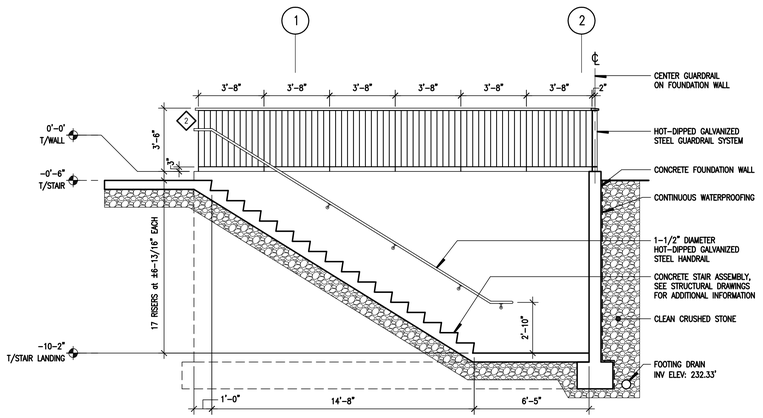
S54 INTERIOR SIPS WALL



S55 PARTIAL HEIGHT WALL



F50 PLYWOOD WOOD FURRING WALL



2 / A-101 SECTION at BASEMENT STAIRS

1/4" = 1'-0"

BASEMENT KEYED NOTES

1. HOT-DIPPED GALVANIZED STEEL GUARDRAIL SYSTEM, SEE DETAILS 3, 4, AND 5 ON SHEET A-508 FOR ADDITIONAL INFORMATION, SIMILAR. PROVIDE GALVANIZED STEEL SLEEVES, SIZED TO FIT GUARDRAIL POSTS, WITH MINIMUM 6" EMBED INTO CONCRETE FOUNDATION WALL. GROUT POSTS INTO SLEEVES.
2. PROVIDE CORROSION-RESISTANT, 1/8" STAINLESS STEEL CHAIN ACROSS FRONT OF STAIR. PROVIDE WELDED STAINLESS STEEL EYE HOOKS MOUNTED TO FACE OF GUARDRAIL SYSTEM, EACH SIDE OF STAIR. PROVIDE STAINLESS STEEL SPRING SNAP CONNECTOR AT ONE END OF CHAIN.
3. FOOTING DRAIN TO CONNECT TO CB-6, SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION

FLOOR PLAN GENERAL NOTES

G1. ALL DIMENSIONS ARE TO FINISH FACE AT EXISTING CONSTRUCTION, TO FACE OF FRAMING AT WOOD CONSTRUCTION AND TO FACE OF MASONRY CONSTRUCTION UNLESS NOTED OTHERWISE.

G2. ± NOTATIONS ARE USED IN DIMENSION STRINGS TO ACCOUNT FOR VARIATIONS BETWEEN DRAWINGS AND FIELD CONDITIONS. CONTRACTOR SHALL VERIFY ALL ± DIMENSIONS DURING LAYOUT AND INFORM ARCHITECT OF ANY DISCREPANCIES OR NECESSARY MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

G3. PROVIDE FIRE RETARDANT SOLID WOOD BLOCKING IN ALL WALLS AS REQUIRED FOR THE SECURE AND PROPER INSTALLATION OF ALL FRAMES, TRIM, CASEWORK, SHELVING, REMOVED ITEMS TO BE REINSTALLED, ACCESSORIES INCLUDING OWNER FURNISHED ITEMS, ETC.

G4. PROVIDE ACCESS DOORS AS REQUIRED TO ACCESS ALL CONCEALED VALVES, OPERATIONAL DEVICES AND AS REQUIRED OR INDICATED FOR NEW OR EXISTING MECHANICAL, ELECTRICAL OR PLUMBING CONDITIONS. PROVIDE STAINLESS STEEL DOORS AND FRAMES AT TOILET ROOMS AND WHERE INDICATED. OTHERWISE PROVIDE PAINTED STEEL DOORS.

G5. DURING WORK PROTECT ALL EXISTING WINDOWS, FLOOR, CEILING, AND WALL FINISHES AND PRODUCTS TO REMAIN AND MOUNTED ITEMS TO REMAIN. FOLLOWING WORK CLEAN AND REPAIR ALL EXISTING WINDOWS, FLOOR, WALL AND CEILING FINISHES TO REMAIN TO LIKE NEW CONDITION.

G6. UNLESS NOTED OTHERWISE, ALL PARTITIONS SHALL EXTEND FROM FLOOR SLAB TO UNDERSIDE OF ROOD DECK ABOVE.

G7. LOCATE DOOR OPENING OR CASED OPENING 6" FROM ADJACENT PERPENDICULAR WALL CONSTRUCTION OR AS INDICATED ON PLANS. DIMENSION IS FROM CLEAR OPENING TO FINISHED FACE OF PERPENDICULAR WALL. WHERE DOOR JAMB IS GRAPHICALLY SHOWN ABUTTING PERPENDICULAR WALL HOLD JAMB TIGHT TO WALL.

G8. ARCHITECTURAL ELEVATION 0'-0" IS EQUAL TO ELEVATION 244.50' INDICATED ON CIVIL AND STRUCTURAL DRAWINGS.

WALL TYPE NOTES

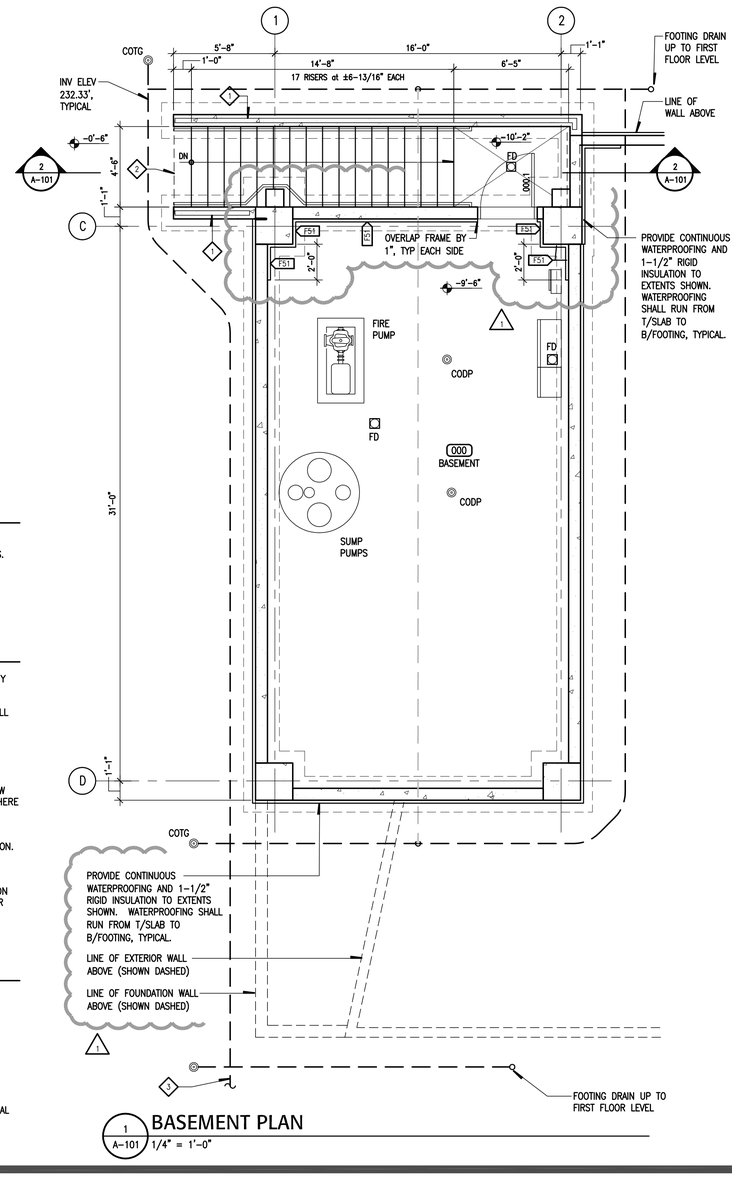
WT1. ALL NEW PARTITION CONSTRUCTION SHALL RUN CONTINUOUS AND COMPLETE TO UNDERSIDE OF FLOOR ASSEMBLY ABOVE, UNLESS NOTED OTHERWISE.

WT2. AT ALL PARTITIONS WITH SOUND ATTENUATION BLANKETS AND / OR SOUND RESISTIVE MODIFIER, PROVIDE ACOUSTICAL SEALANT FULL PERIMETER OF PARTITION AND AT ALL PENETRATIONS (TYPICAL BOTH SIDES OF PARTITION).

WT3. PROVIDE CONCEALED DIAGONAL BRACING AT WALLS AND DOORS AS REQUIRED TO PREVENT LATERAL MOTION OF PARTITION ASSEMBLIES.

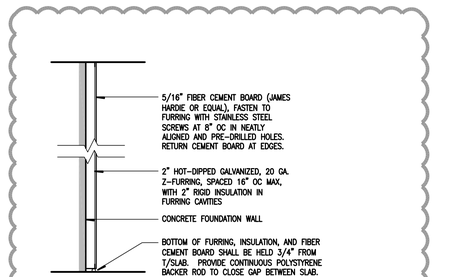
WT4. PROVIDE DOUBLE STUDS ON EITHER SIDE OF CARRIERS AT PLUMBING FIXTURE LOCATIONS. AT ALL LAVATORIES WITH CHAIR CARRIER SUPPORTS PROVIDE MIN. 2x6 WOOD STUD CONSTRUCTION WITH STUDS BACK TO BACK AT EACH SIDE OF THE CARRIER SUPPORT.

WT5. HOLD THE BOTTOM OF THE GYPSUM BOARD 1/2" ABOVE THE DECK AT ALL WALL CONSTRUCTION. AT ACOUSTICAL WALLS SEAL THE GAP WITH ACOUSTICAL CAULKING AND SEALANT.



1 / A-101 BASEMENT PLAN

1/4" = 1'-0"



F51 INSULATED FIBER-CEMENT FURRING WALL

ABBREVIATIONS

AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
AR	ABUSE RESISTANT
ARCH	ARCHITECTURAL
B/	BOTTOM OF
CB	CATCH BASIN
CIP	CAST IN PLACE
CLG	CEILING
COL	COLUMN
CODP	CLEAN OUT DECK PLATE
COTG	CLEAN OUT TO GRADE
CJ	CONTROL JOINT
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
ELEC	ELECTRICAL
EQ	EQUAL
EX, EXIST	EXISTING
FIN	FINISHED
FO	FINISHED OPENING
FR	FIRE RETARDANT
FF	FINISH FACE TO FINISH FACE
FT	FOOT
GC	GENERAL CONTRACTOR
GYP BD	GYPSUM BOARD
HCP	HANDICAP
HP, H.P.	HIGH POINT
ID, I.D.	INSIDE DIAMETER
IN	INCH
LP, L.P.	LOW POINT
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL ELECTRICAL PLUMBING
MIN	MINIMUM
MTD	MOUNTED
MTL	METAL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC, O.C.	ON CENTER
OD, O.D.	OUTSIDE DIAMETER
PC	PRECAST CONCRETE
PL	PLATE
PLAM	PLASTIC LAMINATE
PTD	PAINTED
PV	PHOTOVOLTAIC
RCB	RESILIENT COVE BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RO, R.O.	ROUGH OPENING
RWL	RAIN WATER LEADER
SAC	SUSPENDED ACOUSTICAL PANEL CEILING SYSTEM
SG	SAFETY GLAZING
SIM	SIMILAR
SIP	STRUCTURAL INSULATED PANEL
SKL	SKYLIGHT
SOG	SLAB ON GRADE
SS, SSTL	STAINLESS STEEL
SSM	SOLID SURFACE MATERIAL
T/	TOP OF
TBD	TO BE DETERMINED
TYP	TYPICAL
VIF	VERIFY INFIELD
VRM	VEGETATED ROOF MODULE
W/	WITH
WG	WIRE GLASS
XPS	EXTRUDED POLYSTYRENE
℄	CENTER LINE
±	PLUS OR MINUS

GENERAL SYMBOLS

ELEVATION NUMBER / SHEET NUMBER — EXTERIOR ELEVATION SYMBOL

ELEVATION NUMBER / SHEET NUMBER — INTERIOR ELEVATION SYMBOL

SECTION NUMBER / SHEET NUMBER — SECTION SYMBOL

DETAIL NUMBER / SHEET NUMBER — DETAIL SECTION SYMBOL

DETAIL NUMBER / SHEET NUMBER — DETAIL SYMBOL

ELEVATION INDICATOR

KEYNOTE

WALL TYPE DESIGNATION

HEIGHT OF WALL, ALL WALLS FULL HEIGHT UNLESS NOTED OTHERWISE

REVISION INDICATOR

ROOM NUMBER / CEILING HEIGHT — ROOM NUMBER / REFLECTED CEILING PLAN

ROOM NUMBER / ROOM NAME / ROOM AREA (SQUARE FEET)

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CONTRACT: CONSTRUCTION

TITLE: PROVIDE VISITOR BUILDING AND SITE IMPROVEMENTS

LOCATION: FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER
56 GAME FARM ROAD, DELMAR, NY

CLIENT: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MARK	DATE	DESCRIPTION
1	07/09/2015	ADDENDUM #5
	02/18/2015	BID DOCUMENT

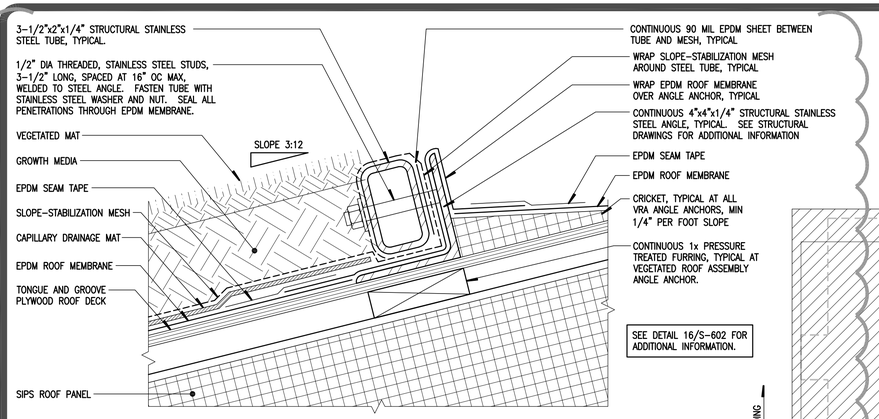
PROJECT NUMBER: 43153-C

DESIGNED BY:
DRAWN BY:
FIELD CHECK:
APPROVED:

SHEET TITLE: VISITOR CENTER GENERAL NOTES AND BASEMENT PLAN

DRAWING NUMBER: **A-101**

SHEET OF



2 / A-104 DETAIL AT VRA ROOF ANGLE ANCHOR
3" = 1'-0"

ROOF LEGEND

- EXISTING ROOF
- EXTENTS OF VEGETATED ROOF ASSEMBLY (VRA)
- GRAVEL/DRAINAGE STONE

SKL1	SKYLIGHT: NOMINAL 44"x46"
SKL1W	SKYLIGHT: NOMINAL 44"x46" WITH WHITE LAMINATED GLASS
SKL2	14" DIA. TUBULAR SKYLIGHT, SEE DETAIL 3/A-507
RA	ROOF ANCHOR WITH LINKED STEEL CABLE FALL PROTECTION SYSTEM
VP	VENT PIPE
WH	NON-FREEZE WALL HYDRANT

ROOF NOTES

RP1. COORDINATE ROUGH OPENING SIZES FOR ROOF EQUIPMENT AND ACCESSORIES WITH MANUFACTURER'S RECOMMENDATIONS.

RP2. SEE SHEET A-504 FOR SKYLIGHT DETAILS

RP3. SEE SHEET A-505 FOR PV SUPPORT DETAILS

RP4. SEE SHEET A-507 FOR ROOF DETAILS

RP5. SEE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION ON ROOF MOUNTED EQUIPMENT AND FIXTURES.

1 / A-104 ROOF PLAN
1/8" = 1'-0"

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MECHANICAL, ELECTRICAL, & PLUMBING ENGINEERING
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Amaze Design
77 North Washington Street
Boston, MA 02114

WARNING:
THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

CONTRACT: CONSTRUCTION

TITLE: PROVIDE VISITOR BUILDING AND SITE IMPROVEMENTS

LOCATION: FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER
56 GAME FARM ROAD, DELMAR, NY

CLIENT: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

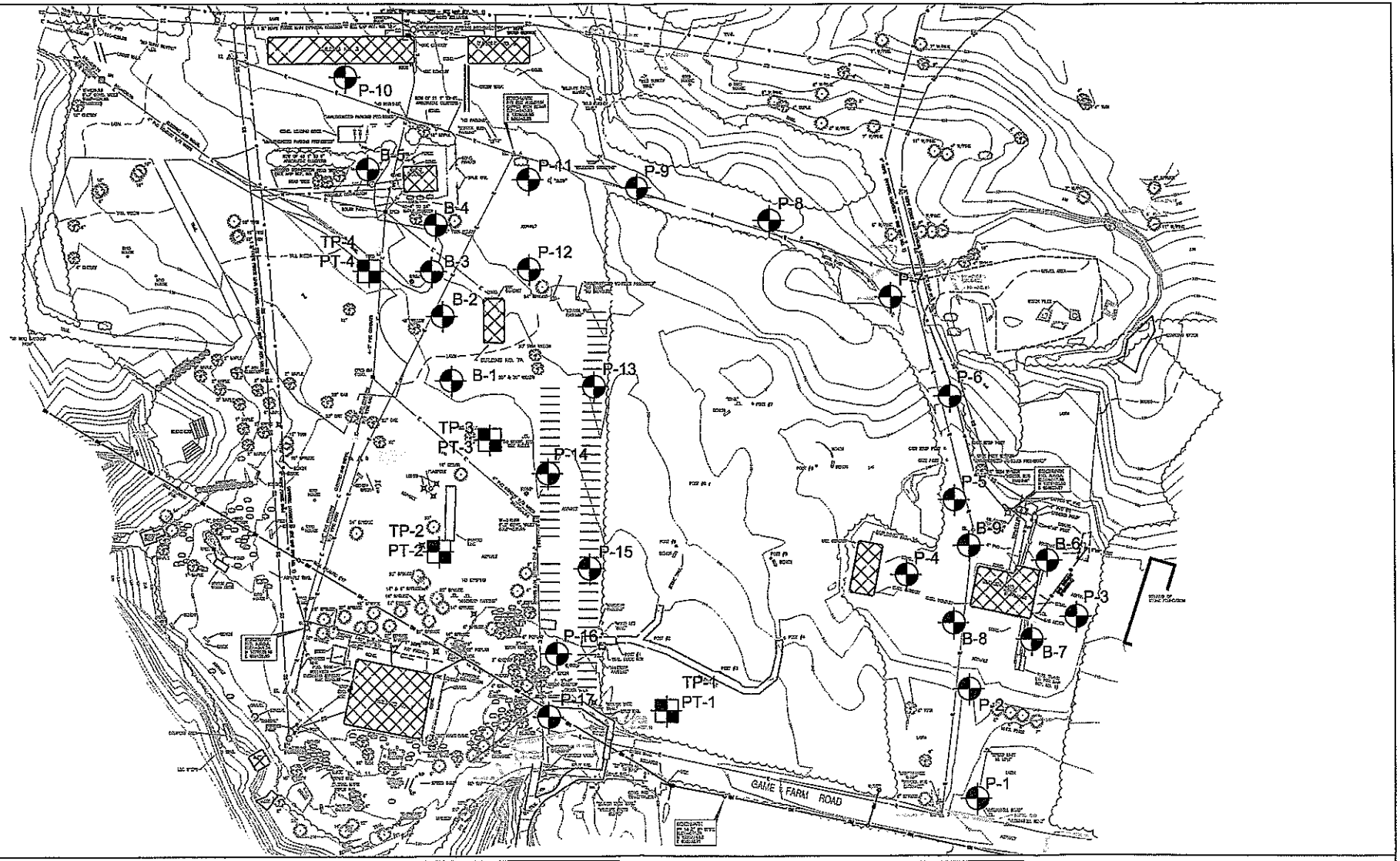
MARK	DATE	DESCRIPTION
1	07/09/2015	ADDENDUM #5
	02/18/2015	BID DOCUMENT

PROJECT NUMBER:	43153-C
DESIGNED BY:	
DRAWN BY:	
FIELD CHECK:	
APPROVED:	

SHEET TITLE:
VISITOR CENTER ROOF PLAN

DRAWING NUMBER:
A-104

SHEET OF



DRAWING LEGEND
APPROXIMATE SOIL BORING LOCATION
APPROXIMATE TEST PIT/PERCOLATION TEST LOCATION

FIVE RIVERS FACILITY
DELMAR, NEW YORK
SUBSURFACE INVESTIGATION PLAN
DRAWN BY: N/A
SCALE: N/A
DATE: DECEMBER 3, 2007

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INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1.1**

PROJECT: Five Rivers Facility	**DATE**	START: 10/24/07	FINISH: 10/24/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	3				+/- 8" Topsoil
				3	3	6	**FILL:** Brown SILT, trace fine sand, trace cinders **(MOIST, LOOSE)**
	2	3	6				Brown/Gray Mottled SILT
				11	11	17	**(MOIST, FIRM)**
	3	2	5				Brown SILT, Some Clay
5'				8	10	13	
	4	15	12				Similar
				15	14	27	
10'							
	5	2	3				Similar
				5	6	8	
							(MOIST, MEDIUM TO HARD)
15'							
	6	1	2				
				3	2	5	Gray CLAY
20'							
	7	WH	1				Similar, with Occasional Fine Sand
				1	2	2	Laminations
25'							
	8	WH	1				Similar
				1	1	2	
							(WET, SOFT TO VERY SOFT)

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-1.2**

PROJECT: Five Rivers Facility	**DATE**	START: 10/24/07	FINISH: 10/24/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	9	WH	1				Gray CLAY with Occasional Fine Sand
				1	2	2	Laminations
35'	10	WH	WH				Similar
				2	2	2	
40'	11	WR	WH				Similar
				WH	2	WH	
45'	12	WH	WH				Similar
				WH	1	WH	**(WET, VERY SOFT)**
							Boring Ended at 47.0'
50'							No measurable groundwater in augers at completion of drilling and sampling.
55'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-2**

PROJECT: Five Rivers Facility	**DATE**	START: 10/24/07	FINISH: 10/24/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 4" Topsoil
	1	1	4				Brown SILT
				5	8	9	
	2	5	8				Similar
				8	13	16	**(MOIST, LOOSE TO FIRM)**
	3	3	7				Brown SILT, Little to Some Clay
5'				9	13	16	
	4	13	15				Similar
				16	15	31	
10'	5	1	4				Grades SILT and CLAY
				5	4	9	
							(MOIST, MEDIUM TO HARD)
15'	6	1	2				
				3	3	5	Gray CLAY **(WET, SOFT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-3**

PROJECT: Five Rivers Facility	**DATE**	START: 10/24/07	FINISH: 10/24/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	2	4				+/- 3" Topsoil
				4	4	8	**FILL:** Black CINDERS **(MOIST)**
	2	4	7				Brown SILT
				8	9	15	**(MOIST, LOOSE TO FIRM)**
	3	4	7				Brown SILT, Some Clay
5'				8	9	15	
	4	12	13				Similar
				15	14	28	
10'	5	1	4				Similar
				5	4	9	
							(MOIST, MEDIUM TO HARD)
15'	6	1	2				
				2	3	4	Gray CLAY with Silt Seams **(WET, SOFT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-4**

PROJECT: Five Rivers Facility	**DATE**	START: 10/25/07	FINISH: 10/25/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 4" Topsoil
	1	2	4				Brown SILT
				8	9	12	
	2	9	9				Similar
				12	12	21	**(MOIST, FIRM)**
	3	1	4				Brown SILT, Little Clay
5'				7	9	11	
	4	11	11				Grades SILT and CLAY
				12	15	23	
10'	5	1	3				Similar
				5	6	8	
							(MOIST, MEDIUM TO STIFF)
15'	6	1	2				Gray SILT and CLAY
				2	4	4	**(WET, SOFT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-5**

PROJECT: Five Rivers Facility	**DATE**	START: 10/25/07	FINISH: 10/25/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 3" Topsoil
	1	2	5				**FILL:** Gray SILT and SHALE Fragments
				8	9	13	**(MOIST, FIRM)**
	2	4	5				Brown Mottled SILT
				5	5	10	**(MOIST, LOOSE)**
	3	2	3				Brown SILT, Little Clay
5'				4	5	7	
	4	6	6				Grades SILT and CLAY
				7	8	13	
10'	5	2	2				Similar
				4	5	6	
							(MOIST, MEDIUM)
15'	6	1	2				Gray CLAY with SILT Seams
				3	3	5	**(WET, SOFT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at
							completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-6**

PROJECT: Five Rivers Facility	**DATE**	START: 10/25/07	FINISH: 10/25/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4" Asphalt and ± 12" Base
	1	8	7				
				4	4	11	Brown/Gray Mottled SILT, Moist
	2	3	4				Similar, Becomes Wet
				4	5	8	
5'	3	2	2				Similar
				2	4	4	
	4	7	10				Grades Brown SILT with Occasional
				16	10	26	Partings Clay
10'	5	1	4				Similar
				6	6	10	
							(MOIST TO WET, LOOSE TO FIRM)
15'	6	2	2				Gray CLAY
				2	3	4	**(WET, SOFT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at
							completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-7**

PROJECT: Five Rivers Facility	**DATE**	START: 10/25/07	FINISH: 10/25/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4" Asphalt and ± 6" Base
	1	15	16				**FILL:** Brown Fine to Coarse SAND, Some
				19	11	35	Gravel, Little Silt **(MOIST, COMPACT)**
	2	5	5				No Recovery in Sample 2
				5	5	10	
5'	3	2	3				Brown SILT
				4	4	7	
	4	3	4				Similar
				7	9	11	**(WET, LOOSE)**
10'	5	2	2				Brown CLAY **(MOIST, SOFT)**
				3	3	5	
15'	6	1	1				Gray CLAY **(WET, SOFT)**
				2	3	3	
							Boring Ended at 17.0'
20'							Groundwater in augers at 14.3' below grade
							at completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-8**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07

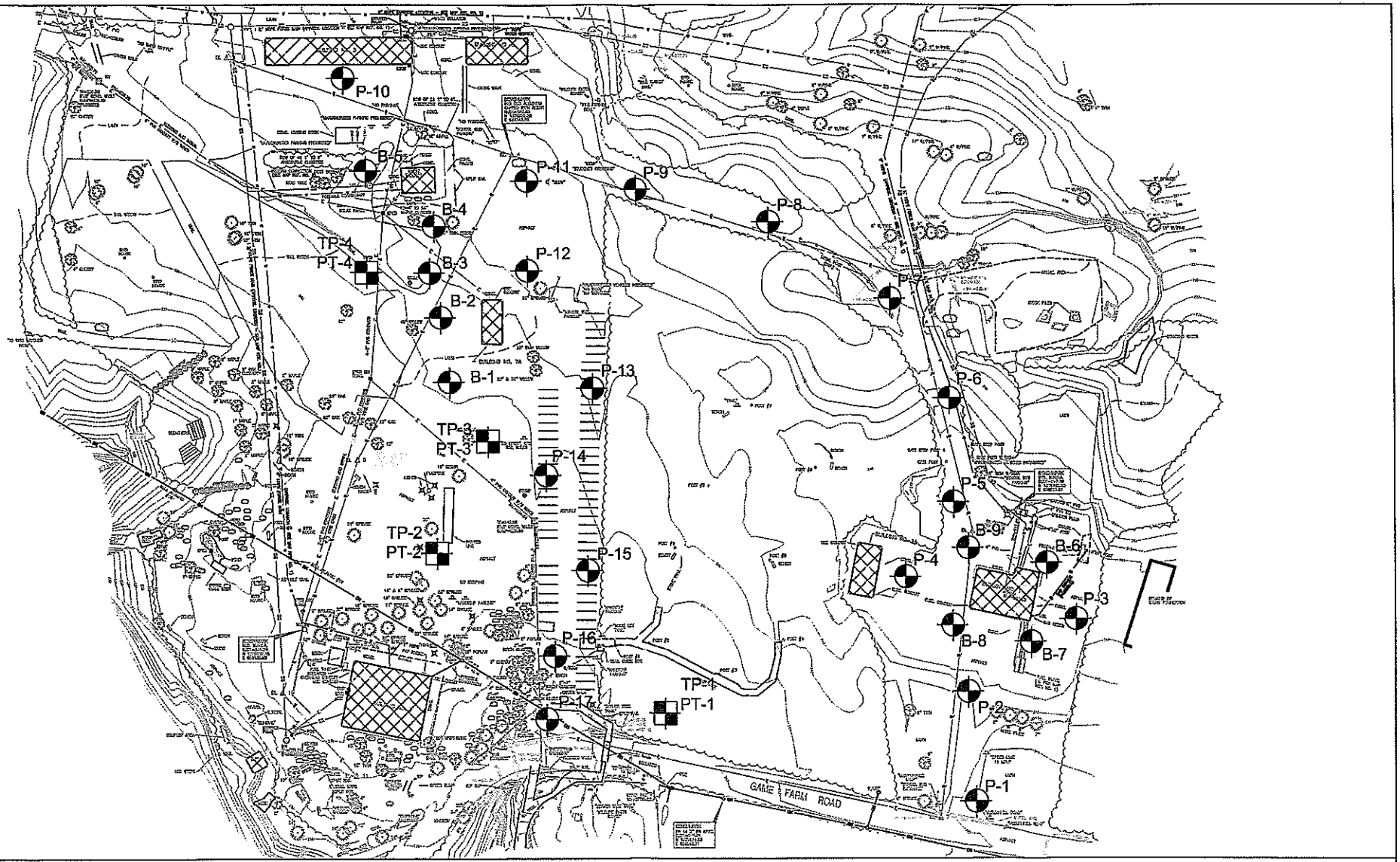
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4" Asphalt and ± 4" Base
	1	15	28				**FILL:** Gray/Brown GRAVEL, Some Fine to
				32	30	60	Coarse Sand, trace silt, Cobbles noted
	2	19	13				**(MOIST, VERY COMPACT)**
				7	8	20	Brown/Gray Mottled SILT, Wet
5'	3	2	4				Grades Little Clay, Moist
				4	3	8	
	4	4	3				Grades Brown SILT, Wet
				4	9	7	**(MOIST/WET, FIRM TO LOOSE)**
10'	5	2	2				Brown SILT and CLAY
				4	4	6	**(MOIST, MEDIUM)**
15'	6	1	2				Gray CLAY **(WET, SOFT)**
				2	2	4	
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at
							completion of drilling and sampling.
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **B-9**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 9" Asphalt, +/- 8" Base
							± 9" Asphalt and ± 8" Base
	1	38	22				
				11	10	33	Brown/Gray Mottled SILT, Moist
	2	4	6				Grades Brown SILT, Wet
				6	16	12	
5'	3	3	12				Similar
				15	10	27	
	4	6	9				Similar
				8	12	17	
							(MOIST TO WET, FIRM)
10'	5	2	3				
				2	3	5	Gray CLAY
15'	6	1	1				Similar
				2	2	3	**(WET, SOFT)**
							Boring Ended at 17.0'
20'							
							No measurable groundwater in augers at completion of drilling and sampling.
25'							



DRAWING LEGEND
APPROXIMATE SOIL BORING LOCATION
APPROXIMATE TEST PIT/PERCOLATION TEST LOCATION

FIVE RIVERS FACILITY
DELMAR, NEW YORK
SUBSURFACE INVESTIGATION PLAN
DRAWN BY: N/A
SCALE: N/A
DATE: DECEMBER 3, 2007

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Fax 716-648-3521

PAVEMENT CORE SUMMARY *Five Rivers Environmental Education Center*		
Core Location	**Asphalt Thickness (inches)**	**Base Course Description and USCS Group***
P-1	4.6	GRAVEL, Some Sand, Little Silt (USCS Group GP-GM)
P-2	6.9	GRAVEL, Some Sand, Little Silt
P-3	4.0	GRAVEL and SAND, Little Silt (USCS Group GP-GM)
P-4	4.0	GRAVEL, Some Sand, Little Silt (USCS Group GM)
P-5	4.8	GRAVEL, Some Sand, Little Silt
P-6	4.1	GRAVEL, Little Sand, Little Silt (USCS Group GM)
P-7	5.5	SILT, Little Sand, Little Gravel (USCS Group ML)
P-8	8.0	SAND and GRAVEL, Little Silt
P-9	3.3	SAND and GRAVEL, Little Silt (USCS Group SM)
P-10	3.2	GRAVEL and SAND, Little Silt (USCS Group GM)
P-11	6.0	GRAVEL and SAND, Little Silt
P-12	4.4	GRAVEL, Some Sand, trace silt
P-13	4.8	GRAVEL, Some Sand, trace silt (USCS Group GW)
P-14	4.5	GRAVEL, Some Sand, trace silt
P-15	4.3	GRAVEL and SAND, trace silt (USCS Group GP-GM)
P-16	4.5	GRAVEL and SAND, Little Silt
P-17	4.6	GRAVEL and SAND, Little Silt (USCS Group GP-GM)

* The Unified Soil Classification System (USCS) Group is provided only for those materials tested for gradation in our laboratory.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-1**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4.6" Asphalt and ± 13" Granular Base
	1	8	11				
				10	5	21	Brown/Gray Mottled SILT, trace to Little Clay
	2	4	3				
				3	5	6	**(MOIST, FIRM / MEDIUM)**
5'	3	4	5				No Sample 3 Recovered
				4	9	9	
							Boring Ended at 6.0'
10'							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-2**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 6.9" Asphalt and ± 6" Granular Base
	1	7	4				Brown/Gray Mottled SILT, trace to Little Clay
				5	4	9	
	2	4	5				Similar
				5	7	10	
5'	3	2	2				Becomes Brown
				3	4	5	**(MOIST TO VERY MOIST, MEDIUM)**
							Boring Ended at 6.0'
10'							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-3**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4.0" Asphalt and 4" Granular Base
	1	7	5				Brown to Brown/Gray Mottled SILT, Moist
				4	5	9	
	2	5	6				Similar
				7	6	13	
5'	3	4	4				Becomes Brown, Wet
				4	8	8	**(MOIST TO WET, LOOSE TO FIRM)**
							Boring Ended at 6.0'
10'							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-4**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4.0" Asphalt and ± 20" Granular and Crushed Stone Base
	1	16	13				
				10	6	23	Brown/Gray Mottled SILT
	2	5	5				
				8	8	13	
5'	3	8	13				Becomes Brown
				15	18	28	**(MOIST, FIRM)**
							Boring Ended at 6.0'
10'							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-5**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07
LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with		
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods		
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**		
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4.8" Asphalt over ± 20" Granular Base
	1	12	9				
				8	7	17	Brown SILT
	2	6	16				
				21	23	37	
5'	3	12	14				Similar, Becomes Wet
				13	14	27	**(MOIST TO WET, COMPACT TO FIRM)**
							Boring Ended at 6.0'
10'							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG **P-6**

PROJECT: Five Rivers Facility	**DATE**	START: 10/26/07	FINISH: 10/26/07

LOCATION: Delmar, New York	**METHODS:** 3-1/4" Hollow Stem Augers with
CLIENT: Hyman Hayes Associates	ASTM D1586 Sampling Methods
JOB NUMBER: FDE-07-234	**SURFACE ELEVATION:**
DRILL TYPE: CME 45C	**CLASSIFICATION:** E. Gravelle

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
							± 4.1" Asphalt and ± 16" Granular Base
	1	8	6				
				4	5	10	Brown SILT, Moist
	2	5	4				Similar, Becomes Wet
				3	5	7	
5'	3	6	4				Similar
				4	4	8	**(MOIST TO WET, LOOSE)**
							Boring Ended at 6.0'
10'							
							No measurable groundwater in augers at completion of drilling and sampling.
15'							
20'							
25'							

DENTE ENGINEERING, P.C.

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☐ P.O. Box 482 Orchard Park, New York 14127 Phone: 716-649-9474 Fax: 716-648-3521

REPORT OF PERCOLATION TEST

PROJECT: Five Rivers Facility	**PROJECT NO:** FDE-07-234	**TEST NO:** PT-1
LOCATION: Delmar, New York	**DATE:** October 29, 2007	**INSPECTOR:** O.Burns
WEATHER: Sunny	**TEMPERATURE:** 40°	
SURFACE CONDITIONS: Forest Bottom		

PROFILE & SOIL TYPES

TOPSOIL THICKNESS	+/- 12.0"
GROUNDWATER DEPTH	Perched Water noted at Bottom of Percolation Hole
BEDROCK DEPTH	N/A
PRESOAK TIME	N/A
PER HOLE DIMENSIONS	12" Diameter x 28" Depth

TEST DATA - PERCOLATION RATE

TIME FOR WATER LEVEL TO DROP FROM 6" TO 5" LEVEL

RUN NUMBER	TIME
1	0.25" in 30 minutes
2	
3	
4	
5	
PERCOLATION RATE STABILIZED AT : Approximately 0.25" in half an hour	

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Five Rivers Facility		**NUMBER:** TP-1
LOCATION: Delmar, New York		**FILE NO.** FDE-07-234
CONTRACTOR: Chip Kronau Construction		**DATE:** October 24, 2007
MAKE: Caterpiller	**MODEL:** 304.5	**ENGINEER:** O.Burns
WEATHER: Overcast	**CAPACITY:** 1/3 yard^3	**BOOM REACH:** +/-8.0'
GROUND LEVEL: +/- 240.0'	**TIME START:** N/A	**TIME STOP:** N/A

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	+/- 12" Topsoil and Forest Bottom	M	
2'	Brown Fine SAND, Some Silt (MOIST)	M	
3'	Brown SILT and CLAY, trace gray mottling	M	
4'		M	
5'	Grades Varved with Occasional Fine Sand Partings	M	
6'		M	
7'	End of test pit 6.0' depth.		
8'	Groundwater was not encountered during excavation.		
9'			
10'			
11'			
12'			
13'			
14'			
15'			

Remarks:

BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F-M = FINE TO MEDIUM F-C = FINE TO COARSE GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D
6" - 18"	A		
18" - 36"	B		
36" & OVER	C		

DENTE ENGINEERING, P.C.

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REPORT OF PERCOLATION TEST

PROJECT: Five Rivers Facility	**PROJECT NO:** FDE-07-234	**TEST NO:** PT-2
LOCATION: Delmar, New York	**DATE:** October 25, 2007	**INSPECTOR:** O.Burns
WEATHER: Sunny	**TEMPERATURE:** 40°	
SURFACE CONDITIONS: Lawn area		

PROFILE & SOIL TYPES

TOPSOIL THICKNESS	+/- 16.0"
GROUNDWATER DEPTH	N/A
BEDROCK DEPTH	N/A
PRESOAK TIME	N/A
PER HOLE DIMENSIONS	9" Diameter x 30" Depth

TEST DATA - PERCOLATION RATE

TIME FOR WATER LEVEL TO DROP FROM 6" TO 5" LEVEL

RUN NUMBER	TIME
1	No movement in 30 minutes
2	
3	
4	
5	
PERCOLATION RATE STABILIZED AT : N/A	

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Five Rivers Facility		**NUMBER:** TP-2
LOCATION: Delmar, New York		**FILE NO.** FDE-07-234
CONTRACTOR: Chip Kronau Construction		**DATE:** October 24, 2007
MAKE: Caterpiller	**MODEL:** 304.5	**ENGINEER:** O.Burns
WEATHER: Overcast	**CAPACITY:** 1/3 yard^3	**BOOM REACH:** +/-8.0'
GROUND LEVEL: +/- 240.0'	**TIME START:** N/A	**TIME STOP:** N/A

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	+/- 16" Topsoil	M	
2'	Brown Fine SAND, Some Silt (MOIST)	M	
3'		M	
4'	Brown/Red SILT and CLAY, trace to Little Gray Mottling	M	
5'		M	
6'	Grades Varved	M	
7'			
8'	End of test pit 6.0' depth.		
9'	Groundwater was not encountered during excavation.		
10'			
11'			
12'			
13'			
14'			
15'			

Remarks:

BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F-M = FINE TO MEDIUM F-C = FINE TO COARSE GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D
6" - 18"	A		
18" - 36"	B		
36" & OVER	C		

DENTE ENGINEERING, P.C.

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REPORT OF PERCOLATION TEST

PROJECT: Five Rivers Facility	**PROJECT NO:** FDE-07-234	**TEST NO:** PT-3
LOCATION: Delmar, New York	**DATE:** October 25, 2007	**INSPECTOR:** O.Burns
WEATHER: Sunny	**TEMPERATURE:** 40°	
SURFACE CONDITIONS: Lawn area		

PROFILE & SOIL TYPES

TOPSOIL THICKNESS	+/- 10.0"
GROUNDWATER DEPTH	N/A
BEDROCK DEPTH	N/A
PRESOAK TIME	N/A
PER HOLE DIMENSIONS	9" Diameter x 29" Depth

TEST DATA - PERCOLATION RATE

TIME FOR WATER LEVEL TO DROP FROM 6" TO 5" LEVEL

RUN NUMBER	TIME
1	13 minutes
2	36 minutes
3	
4	
5	
PERCOLATION RATE STABILIZED AT : Approximately 30 minutes for 1" drop	

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Five Rivers Facility		**NUMBER:** TP-3
LOCATION: Delmar, New York		**FILE NO.** FDE-07-234
CONTRACTOR: Chip Kronau Construction		**DATE:** October 24, 2007
MAKE: Caterpiller	**MODEL:** 304.5	**ENGINEER:** O.Burns
WEATHER: Overcast	**CAPACITY:** 1/3 yard^3	**BOOM REACH:** +/-8.0'
GROUND LEVEL: +/- 240.5'	**TIME START:** N/A	**TIME STOP:** N/A

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	+/- 10" Topsoil and Gray Gravel Fill	M	
2'	Brown Fine SAND, Some Silt (MOIST)	M	
3'	Brown/Gray Mottled SILT and CLAY	M	
4'	Brown/Red SILT and CLAY	M	
5'		M	
6'	Grades Varved	M	
7'			
8'	End of test pit 6.0' depth.		
9'	Groundwater was not encountered during excavation.		
10'			
11'			
12'			
13'			
14'			
15'			

Remarks:

BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F-M = FINE TO MEDIUM F-C = FINE TO COARSE GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D
6" - 18"	A		
18" - 36"	B		
36" & OVER	C		

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REPORT OF PERCOLATION TEST

PROJECT: Five Rivers Facility	**PROJECT NO:** FDE-07-234	**TEST NO:** PT-4
LOCATION: Delmar, New York	**DATE:** October 25, 2007	**INSPECTOR:** O.Burns
WEATHER: Sunny	**TEMPERATURE:** 40°	
SURFACE CONDITIONS: Field with tall grasses		

PROFILE & SOIL TYPES

TOPSOIL THICKNESS	+/- 6.0"
GROUNDWATER DEPTH	N/A
BEDROCK DEPTH	N/A
PRESOAK TIME	N/A
PER HOLE DIMENSIONS	10" Diameter x 25" Depth

TEST DATA - PERCOLATION RATE

TIME FOR WATER LEVEL TO DROP FROM 6" TO 5" LEVEL

RUN NUMBER	TIME
1	6.5 minutes
2	10 minutes
3	16.5 minutes
4	18 minutes
5	
PERCOLATION RATE STABILIZED AT : Approximately 16 minutes for 1" drop	

DENTE ENGINEERING

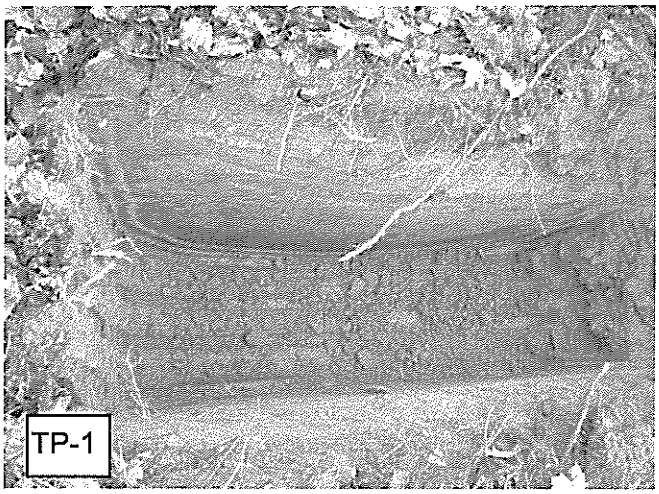
TEST PIT FIELD LOG

PROJECT: Five Rivers Facility		**NUMBER:** TP-4
LOCATION: Delmar, New York		**FILE NO.** FDE-07-234
CONTRACTOR: Chip Kronau Construction		**DATE:** October 24, 2007
MAKE: Caterpiller	**MODEL:** 304.5	**ENGINEER:** O.Burns
WEATHER: Overcast	**CAPACITY:** 1/3 yard^3	**BOOM REACH:** +/-8.0'
GROUND LEVEL: +/- 241.0'	**TIME START:** N/A	**TIME STOP:** N/A

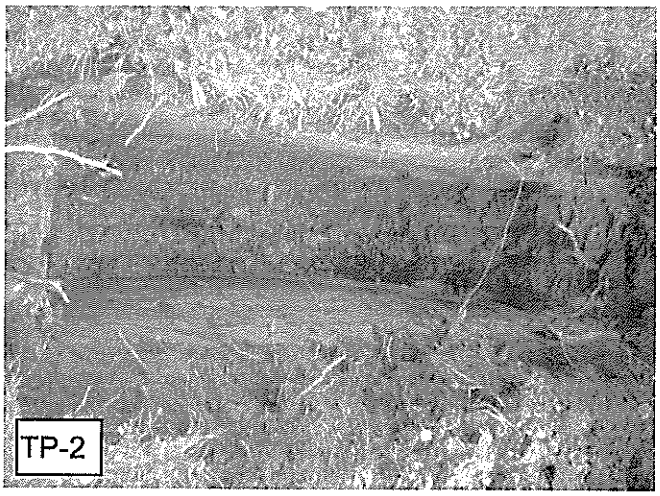
DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
	+/- 6" Topsoil	M	
1'	**FILL**: Brown Fine SAND, Some Silt, clay tile (MOIST)	M	
2'	Grades Some Gray F-C Sand, trace plastic	M	
3'	Brown SILT and CLAY, Little Gray Mottling, Some Clayey Silt	M	
4'	Seams noted, Grades to Brown/Red at 4.5' depth	M	
5'	Grades Varved	M	
6'		M	
7'			
8'	End of test pit 7.0' depth.		
9'	Groundwater was not encountered during excavation.		
10'			
11'			
12'			
13'			
14'			
15'			

Remarks:

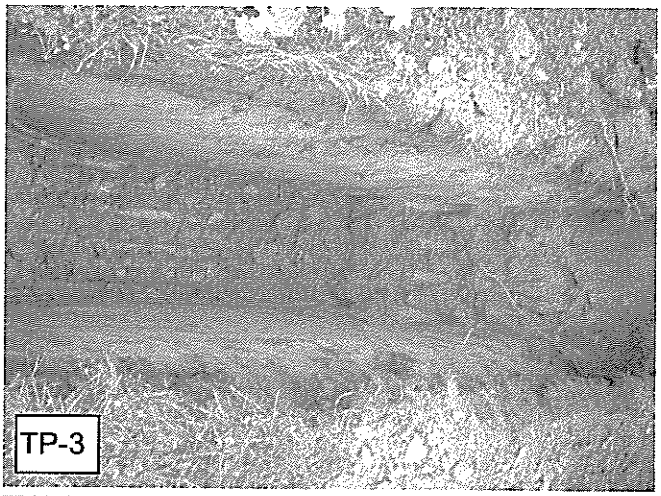
BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F-M = FINE TO MEDIUM F-C = FINE TO COARSE GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D
6" - 18"	A		
18" - 36"	B		
36" & OVER	C		

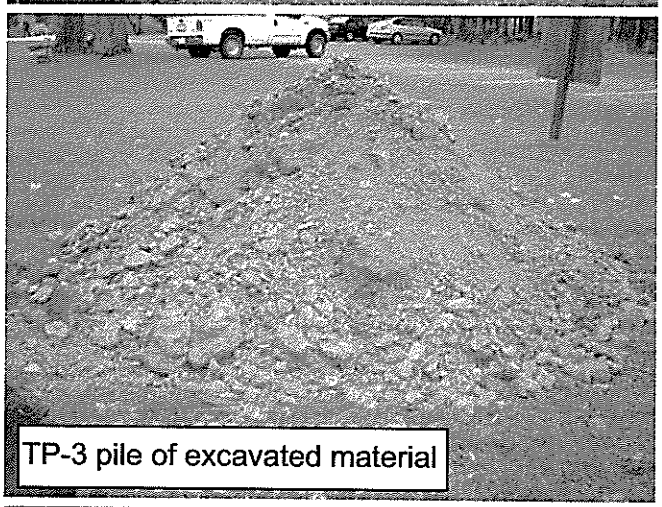

TP-1


TP-1 pile of excavated material

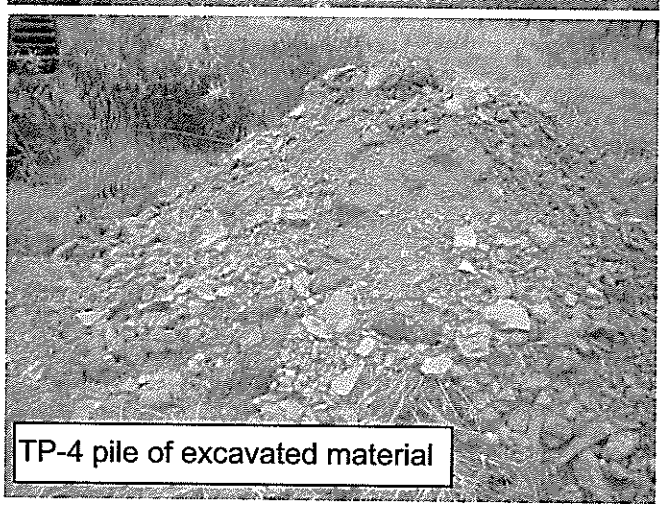

TP-2


TP-2 pile of excavated material

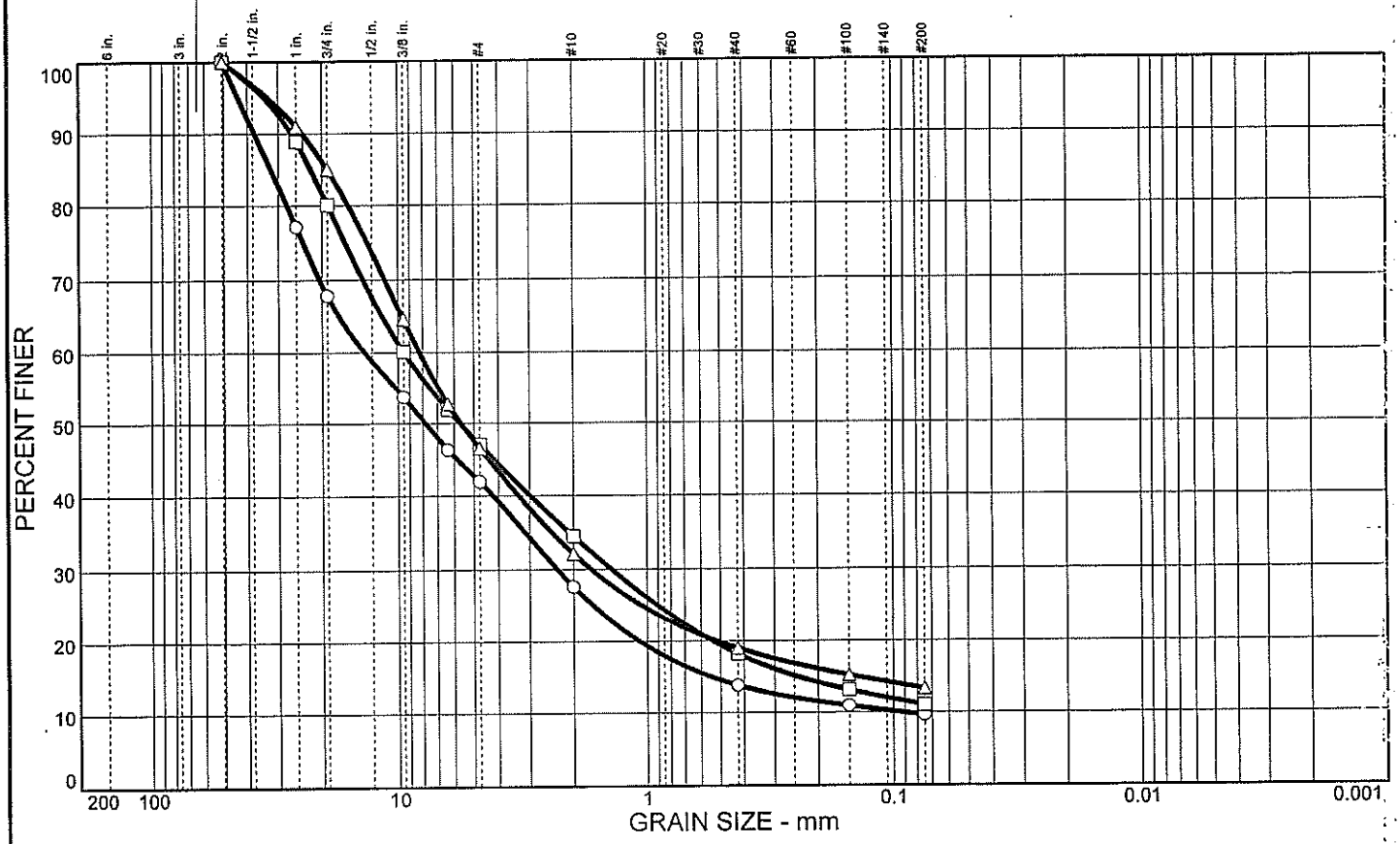

TP-3


TP-3 pile of excavated material


TP-4


TP-4 pile of excavated material

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		58.1	32.3	9.6		GP-GM	A-1-a	NP	NP
□		53.0	36.0	11.0		GP-GM	A-1-a	NP	NP
△		53.5	33.2	13.3		GM	A-1-a	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
2	100.0	100.0	100.0
1	77.1	88.9	91.0
.75	67.8	80.1	85.0
.375	53.7	60.1	64.6
.25	46.3	51.9	52.7
	GRAIN SIZE		
D_{60}	13.6	9.48	8.23
D_{30}	2.33	1.40	1.70
D_{10}	0.0932		
	COEFFICIENTS		
C_c	4.29		
C_u	145.73		

SIEVE number size	PERCENT FINER ○	□	△
#4	41.9	47.0	46.5
#10	27.6	34.5	32.1
#40	13.8	18.2	19.0
#100	10.9	13.1	15.2
#200	9.6	11.0	13.3

SOIL DESCRIPTION

○ GRAVEL, some coarse to fine Sand, little Silt

□ GRAVEL and coarse to fine SAND, little Silt

△ GRAVEL, some coarse to fine Sand, little Silt

REMARKS:

○ Tested By: GB Checked By: EG
Per ASTM D422 Washed

□ Tested By: GB Checked By: EG
Per ASTM D422 Washed

△ Tested By: GB Checked By: EG
Per ASTM D422 Washed

○ Source: Test Pits — Sample No.: 444: P1 — Elev./Depth: Pavement Base

□ Source: Test Pits — Sample No.: 445: P3 — Elev./Depth: Pavement Base

△ Source: Test Pits — Sample No.: 446: P4 — Elev./Depth: Pavement Base

EVERGREEN TESTING, INC.
Watervliet, NY

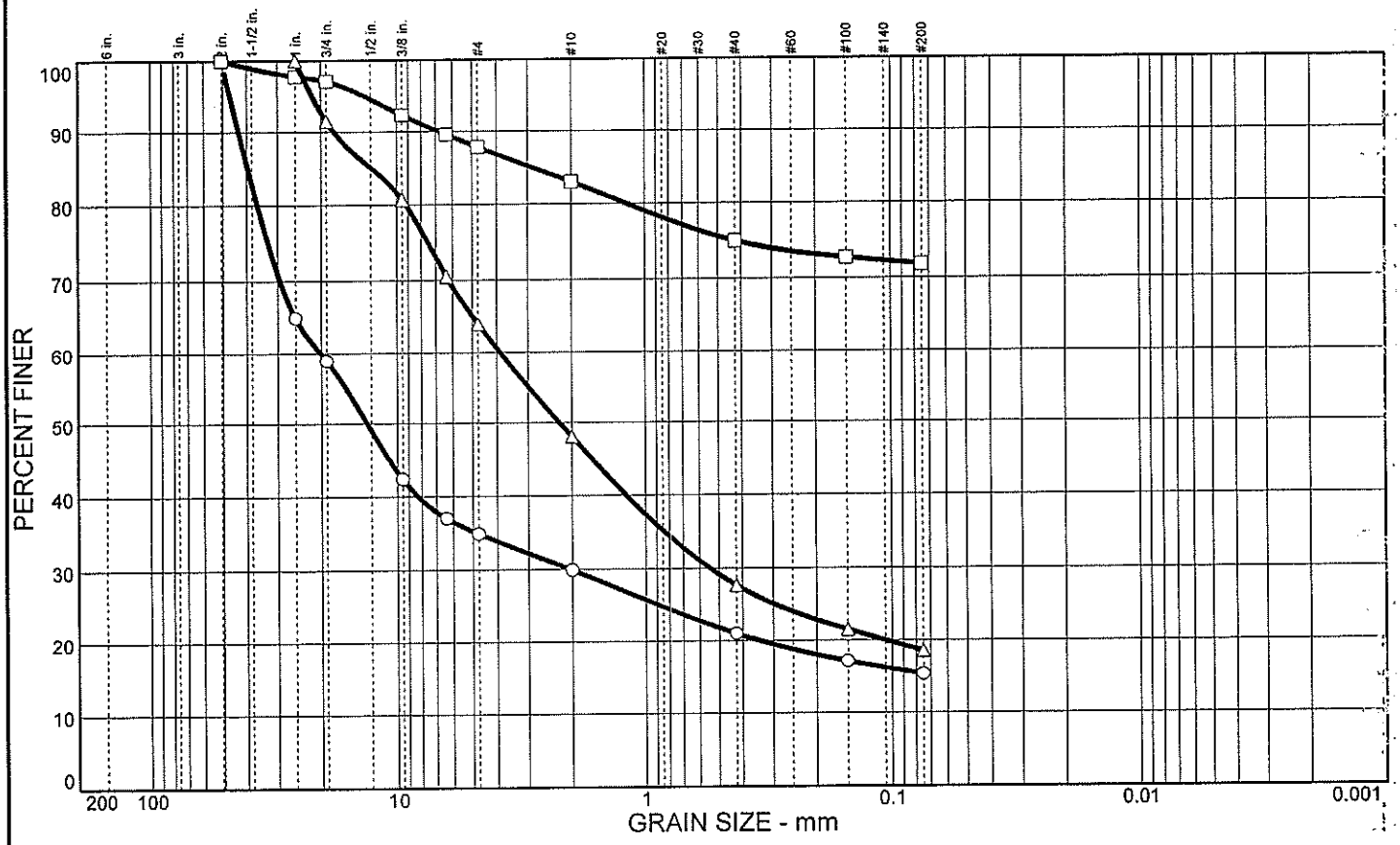
Client: Hyman Hayes Associates

Project: Five Rivers Facility

Project No.: FDE-07-234

Figure 444-446

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		65.1	19.6	15.3		GM	A-1-a	NP	NP
□		12.2	16.1	71.7		ML	A-4(0)	NP	NP
△		36.0	45.5	18.5		SM	A-1-b	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
2	100.0	100.0	
1	64.9	97.8	100.0
.75	58.9	97.1	91.5
.375	42.3	92.3	80.7
.25	37.0	89.6	70.5
	GRAIN SIZE		
D_{60}	20.2		3.89
D_{30}	2.04		0.543
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	34.9	87.8	64.0
#10	29.9	83.0	48.0
#40	21.0	74.9	27.7
#100	17.1	72.6	21.5
#200	15.3	71.7	18.5

SOIL DESCRIPTION

○ GRAVEL, little coarse to fine Sand, little Silt

□ SILT, little coarse to fine Sand, little Gravel

△ coarse to fine SAND and GRAVEL, little Silt

REMARKS:

○ Tested By: GB Checked By: EG
Per ASTM D422 Washed

□ Tested By: GB Checked By: EG
Per ASTM D422 Washed

△ Tested By: GB Checked By: EG
Per ASTM D422 Washed

○ Source: Test Pits — Sample No.: 447: P6 — Elev./Depth: Pavement Base

□ Source: Test Pits — Sample No.: 448: P7 — Elev./Depth: Pavement Base

△ Source: Test Pits — Sample No.: 449: P9 — Elev./Depth: Pavement Base

EVERGREEN TESTING, INC.
Watervliet, NY

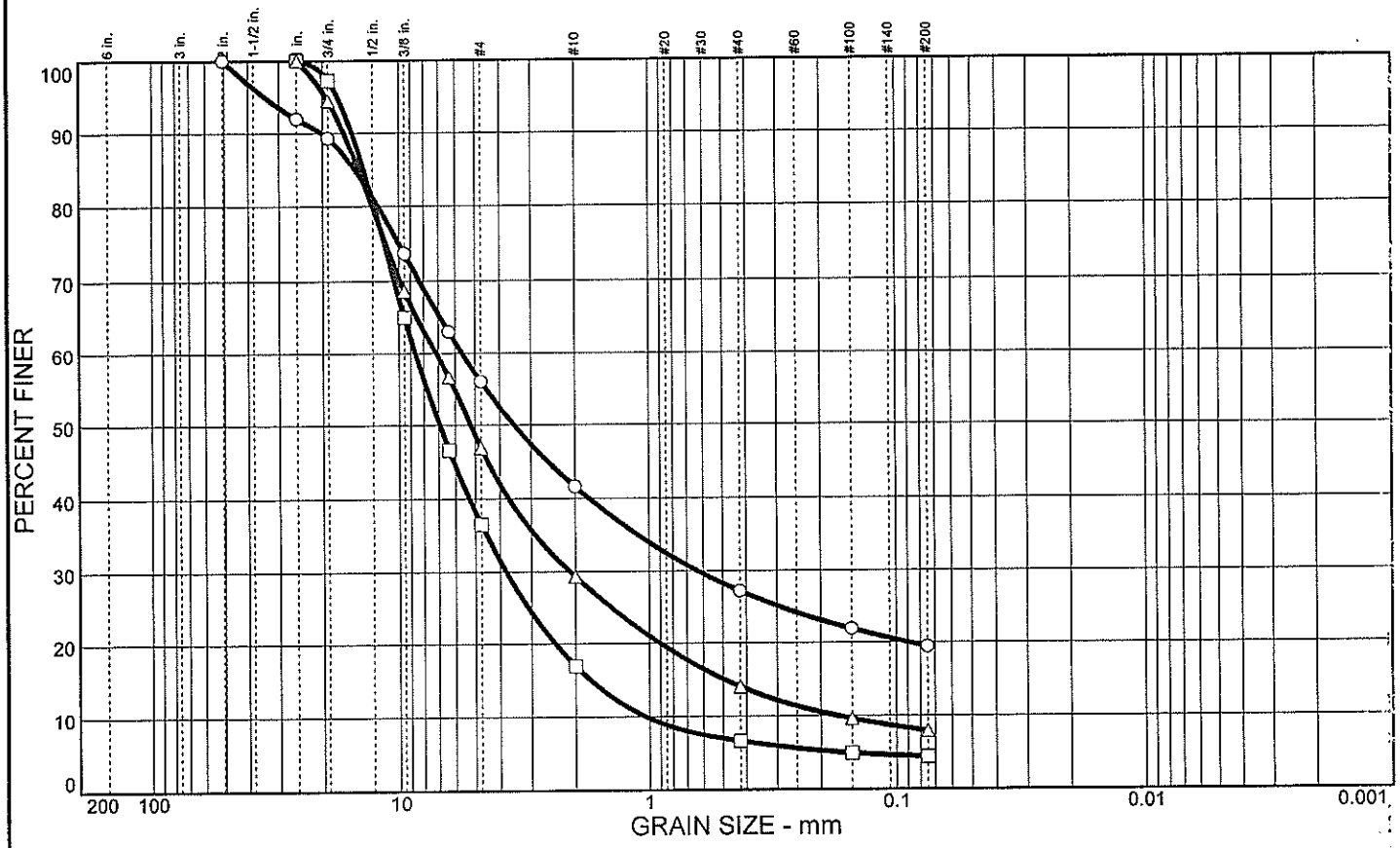
Client: Hyman Hayes Associates

Project: Five Rivers Facility

Project No.: FDE-07-234

Figure 447-449

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		44.0	36.6	19.4		GM	A-1-b	NP	NP
□		63.5	32.1	4.4		GW	A-1-a	NP	NP
△		53.1	39.0	7.9		GP-GM	A-1-a	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
2	100.0		
1	92.0	100.0	100.0
.75	89.3	97.3	94.5
.375	73.6	65.0	68.6
.25	63.0	46.6	56.6
	GRAIN SIZE		
D_{60}	5.63	8.63	7.12
D_{30}	0.632	3.79	2.10
D_{10}		1.04	0.172
	COEFFICIENTS		
C_c		1.60	3.62
C_u		8.32	41.46

SIEVE number size	PERCENT FINER ○	□	△
#4	56.0	36.5	46.9
#10	41.6	16.9	29.3
#40	27.2	6.6	14.0
#100	21.9	4.9	9.6
#200	19.4	4.4	7.9

SOIL DESCRIPTION

○ GRAVEL and coarse to fine SAND, little Silt

□ GRAVEL some coarse to fine Sand, trace Silt

△ GRAVEL and coarse to fine SAND, trace Silt

REMARKS:

○ Tested By: GB Checked By: EG
Per ASTM D422 Washed

□ Tested By: GB Checked By: EG
Per ASTM D422 Washed

△ Tested By: GB Checked By: EG
Per ASTM D422 Washed

○ Source: Test Pits — Sample No.: 450: P10 — Elev./Depth: Pavement Base

□ Source: Test Pits — Sample No.: 451: P13 — Elev./Depth: Pavement Base

△ Source: Test Pits — Sample No.: 452: P15 — Elev./Depth: Pavement Base

EVERGREEN TESTING, INC.
Watervliet, NY

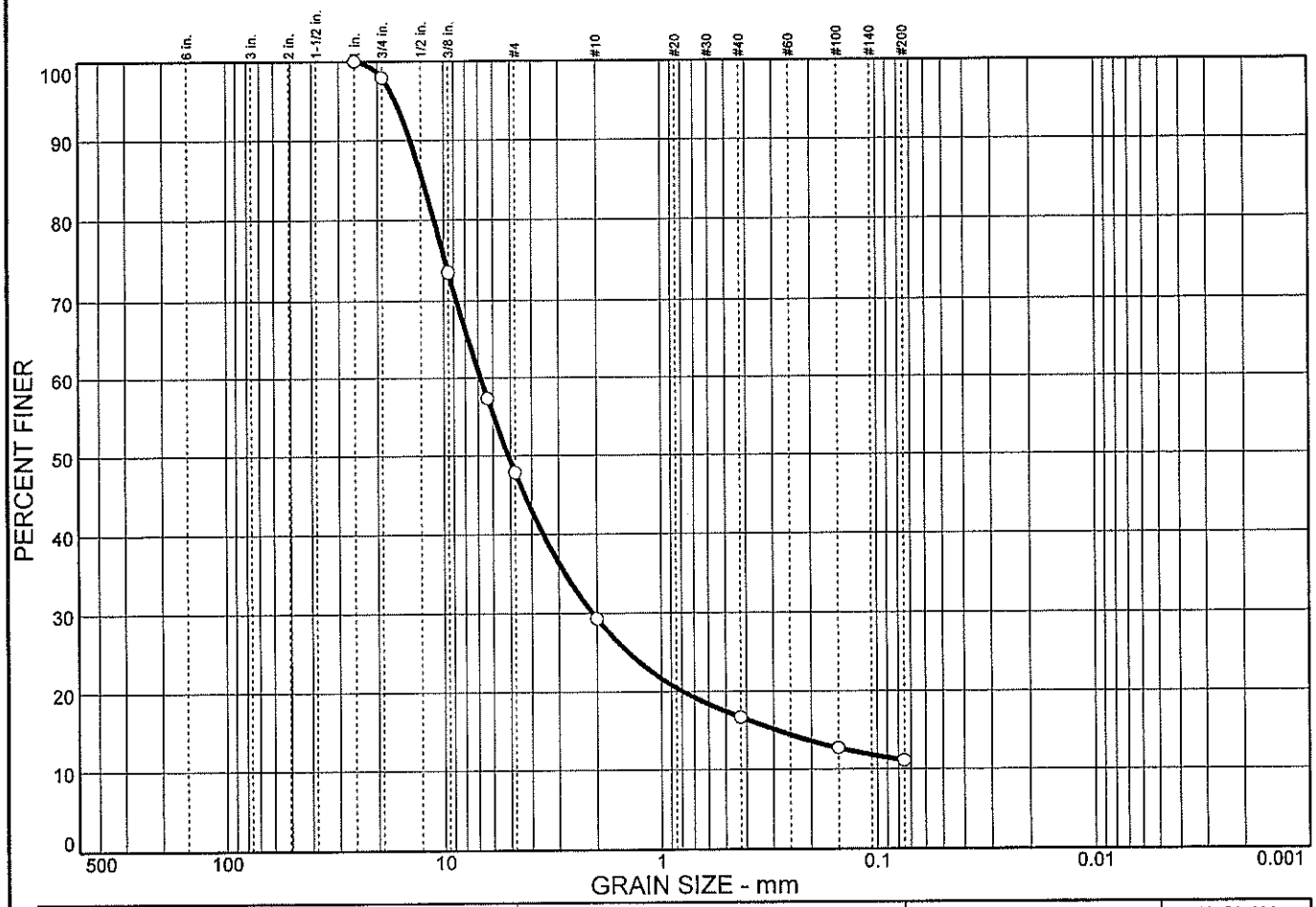
Client: Hyman Hayes Associates

Project: Five Rivers Facility

Project No.: FDE-07-234

Figure 450-452

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	52.2	36.7	11.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	97.9		
.375 in.	73.5		
.25 in.	57.3		
#4	47.8		
#10	29.3		
#40	16.7		
#100	12.7		
#200	11.1		

* (no specification provided)

Material Description

GRAVEL and coarse to fine SAND, little Silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 12.5 D_{60}= 6.83 D_{50}= 5.11
D_{30}= 2.10 D_{15}= 0.287 D_{10}=
C_u= C_c=

Classification

USCS= GP-GM AASHTO= A-1-a

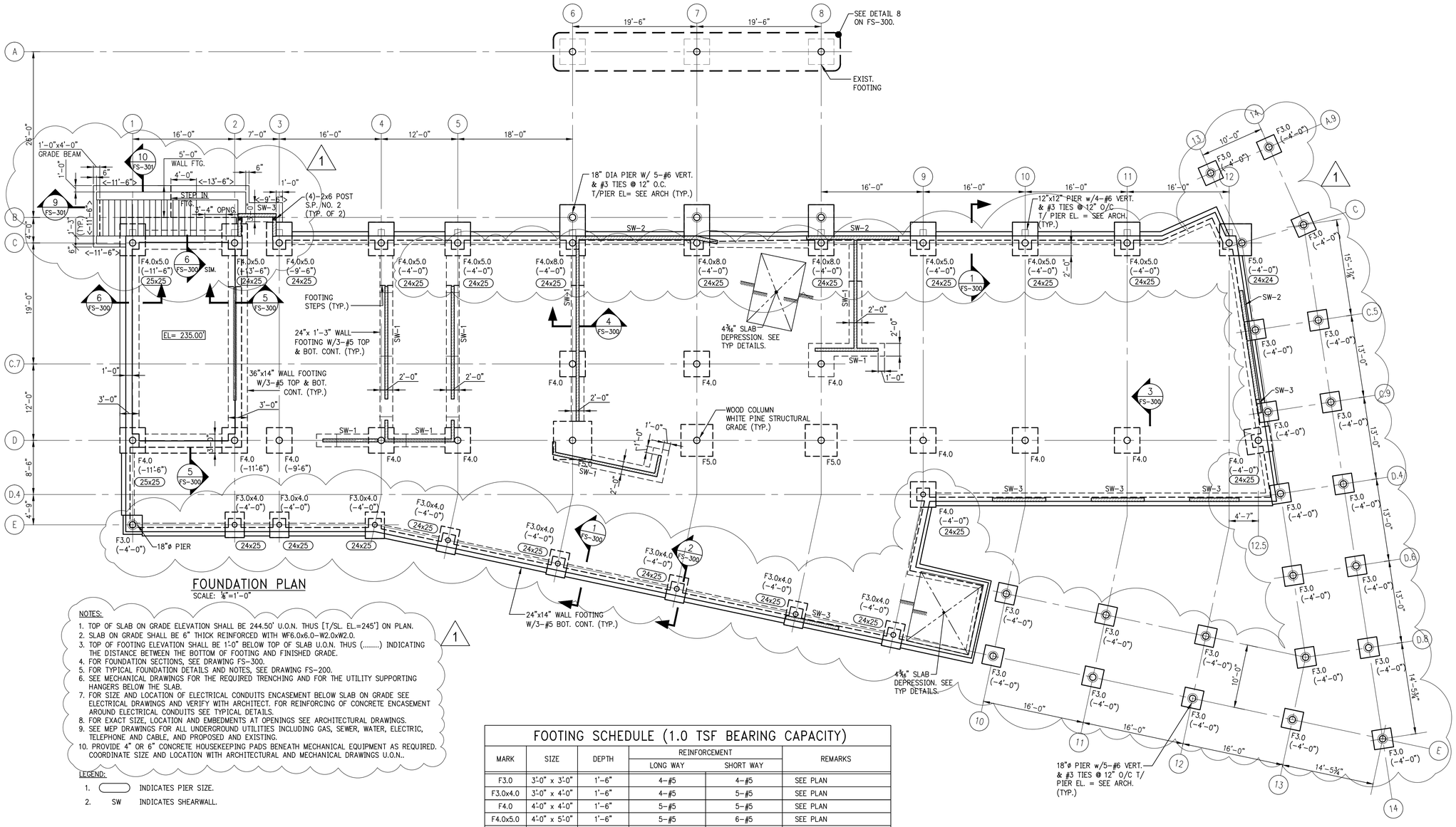
Remarks

Tested By: GB Checked By: EG
Per ASTM D422 Washed

Sample No.: 453: P17 **Source of Sample:** Test Pits **Date:** 12-10-07
Location: **Elev./Depth:** Pavement

EVERGREEN TESTING, INC.
Watervliet, NY

Client: Hyman Hayes Associates
Project: Five Rivers Facility
Project No: FDE-07-234 **Figure** 453



FOUNDATION PLAN

SCALE: 1/8"=1'-0"

NOTES:

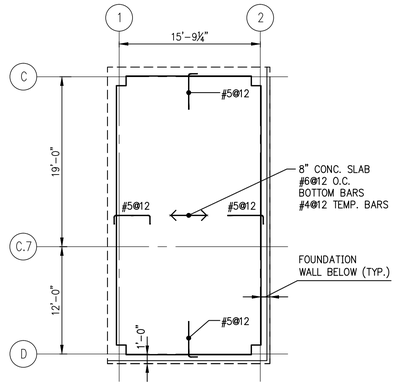
1. TOP OF SLAB ON GRADE ELEVATION SHALL BE 244.50' U.O.N. THUS [T/SL. EL.=245'] ON PLAN.
2. SLAB ON GRADE SHALL BE 6" THICK REINFORCED WITH WF6.0x6.0-W2.0xW2.0.
3. TOP OF FOOTING ELEVATION SHALL BE 1'-0" BELOW TOP OF SLAB U.O.N. THUS (.....) INDICATING THE DISTANCE BETWEEN THE BOTTOM OF FOOTING AND FINISHED GRADE.
4. FOR FOUNDATION SECTIONS, SEE DRAWING FS-300.
5. FOR TYPICAL FOUNDATION DETAILS AND NOTES, SEE DRAWING FS-200.
6. SEE MECHANICAL DRAWINGS FOR THE REQUIRED TRENCHING AND FOR THE UTILITY SUPPORTING HANGERS BELOW THE SLAB.
7. FOR SIZE AND LOCATION OF ELECTRICAL CONDUITS ENCASEMENT BELOW SLAB ON GRADE SEE ELECTRICAL DRAWINGS AND VERIFY WITH ARCHITECT. FOR REINFORCING OF CONCRETE ENCASEMENT AROUND ELECTRICAL CONDUITS SEE TYPICAL DETAILS.
8. FOR EXACT SIZE, LOCATION AND EMBEDMENTS AT OPENINGS SEE ARCHITECTURAL DRAWINGS.
9. SEE MEP DRAWINGS FOR ALL UNDERGROUND UTILITIES INCLUDING GAS, SEWER, WATER, ELECTRIC, TELEPHONE AND CABLE, AND PROPOSED AND EXISTING.
10. PROVIDE 4" OR 6" CONCRETE HOUSEKEEPING PADS BENEATH MECHANICAL EQUIPMENT AS REQUIRED. COORDINATE SIZE AND LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS U.O.N..

LEGEND:

1. ⬭ INDICATES PIER SIZE.
2. SW INDICATES SHEARWALL.

FOOTING SCHEDULE (1.0 TSF BEARING CAPACITY)

MARK	SIZE	DEPTH	REINFORCEMENT		REMARKS
			LONG WAY	SHORT WAY	
F3.0	3'-0" x 3'-0"	1'-6"	4-#5	4-#5	SEE PLAN
F3.0x4.0	3'-0" x 4'-0"	1'-6"	4-#5	5-#5	SEE PLAN
F4.0	4'-0" x 4'-0"	1'-6"	5-#5	5-#5	SEE PLAN
F4.0x5.0	4'-0" x 5'-0"	1'-6"	5-#5	6-#5	SEE PLAN
F4.0x8.0	4'-0" x 8'-0"	1'-6"	5-#6	7-#6	SEE PLAN
F5.0	5'-0" x 5'-0"	1'-6"	6-#5	6-#5	SEE PLAN
F6.0	6'-0" x 6'-0"	1'-6"	7-#5	7-#5	SEE PLAN



SLAB OVER BASEMENT PART PLAN

SCALE: 1/8"=1'-0"

SHEAR WALL SCHEDULE

SW MARK	STUD SIZE & SPACING	WALL SHEATHING
SW-1	2x6 (S.P. NO.2) @ 16" O/C	7/16" MIN. APA RATED PLYWOOD SHEATHING, EXPOSURE 1
SW-2	3 1/16x5 1/2 (1.9E LVL) @ 16" O/C	7/16" MIN. APA RATED PLYWOOD SHEATHING, EXTERIOR EXPOSURE
SW-3	1 3/4x5 1/2 (1.9E LVL) @ 16" O/C	

NOTES:

1. FASTEN WALL SHEATHING TO STUDS WITH 8d COMMON NAILS @ 4" O/C AT ALL PANEL EDGES, AND @ 12" O/C AT INTERMEDIATE PANEL SUPPORTS.
2. PROVIDE 2X BLOCKING AT ALL PANEL EDGES.
3. PROVIDE (1)HTT4 AT END, CORNER OF WALL, AND EACH SIDE OF OPENINGS. ATTACH HTT4 TO BASE CONCRETE w/ 5/8"ø x 10" EMBED EPOXY THREADED-ROD, AND TO WALL STUD w/ 18-10d x 1½" NAILS.

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Clifton Park, New York 12065

EXHIBIT DESIGN
Amaze Design
77 North Washington Street
Boston, MA 02114

CONTRACT: CONSTRUCTION

TITLE: PROVIDE VISITOR BUILDING AND SITE IMPROVEMENTS

LOCATION: FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER
56 GAME FARM ROAD, DELMAR, NY

CLIENT: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MARK	DATE	DESCRIPTION
1	07/09/2015	ADDENDUM #5
	02/18/2015	BID DOCUMENT

PROJECT NUMBER: 43153-C

DESIGNED BY:

DRAWN BY:

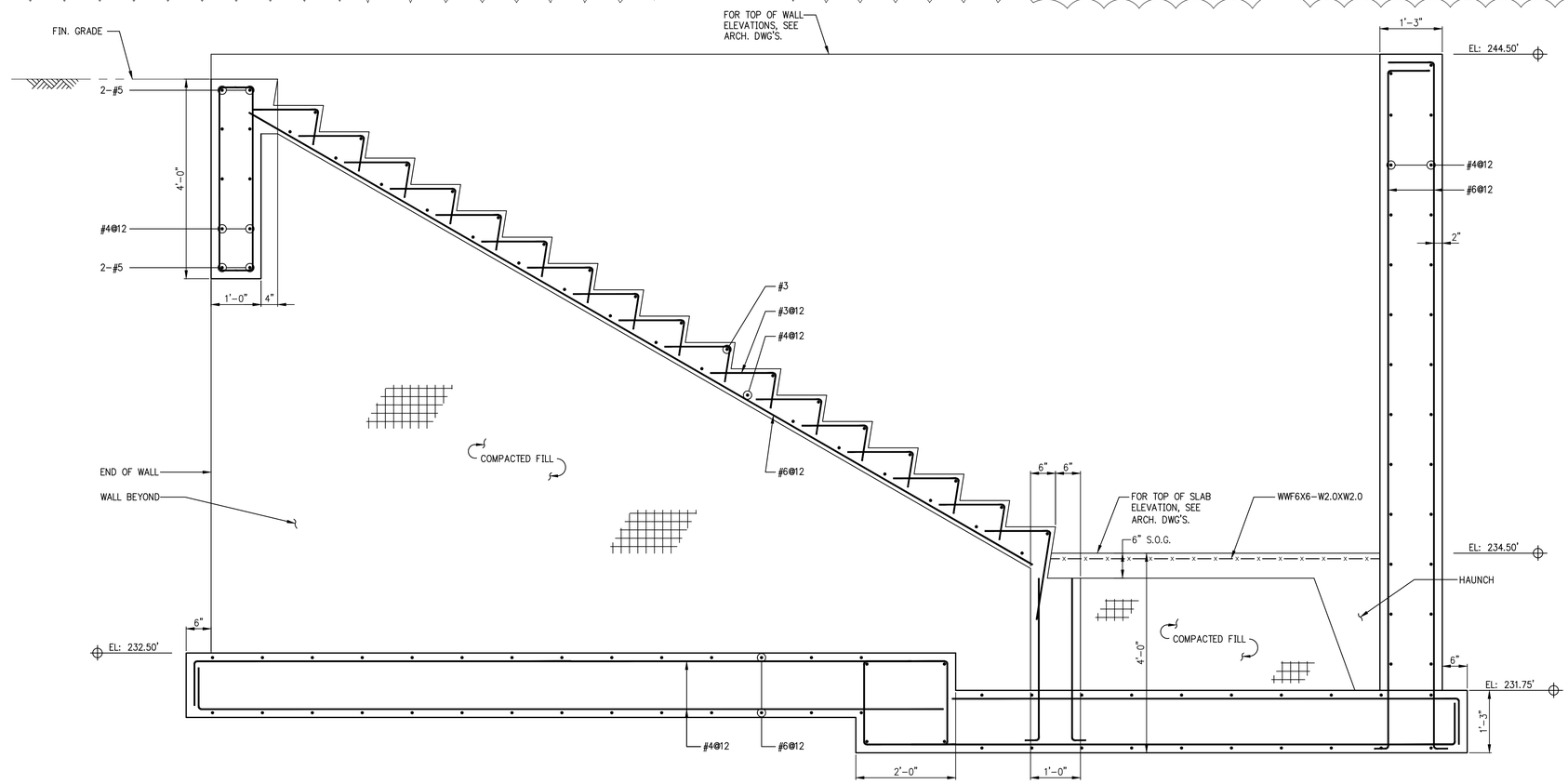
FIELD CHECK:

APPROVED:

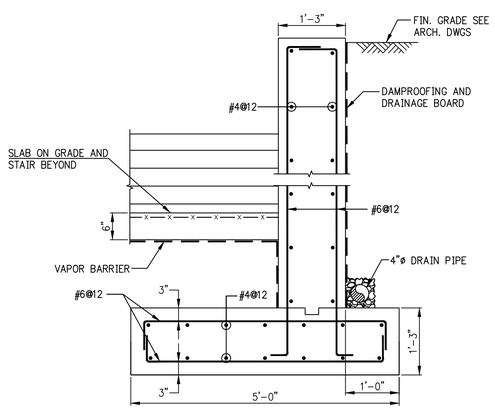
SHEET TITLE: VISITOR CENTER - FOUNDATION PLAN

DRAWING NUMBER: **FS-100**

SHEET OF



9 FS-301 SECTION
SCALE: 3/4"=1'-0"



10 FS-301 SECTION
SCALE: 3/4"=1'-0"

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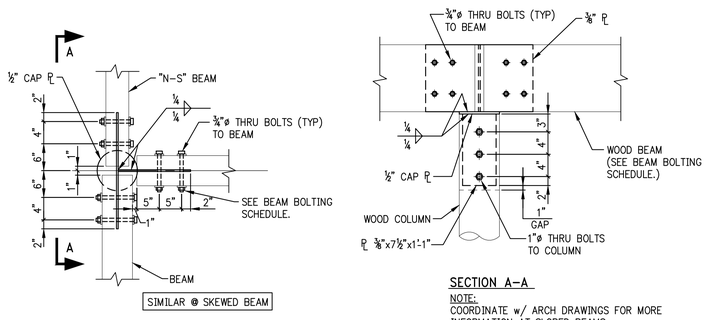
	02/18/2015	BID DOCUMENT

PROJECT NUMBER:	43153-C
DESIGNED BY:	
DRAWN BY:	
FIELD CHECK:	
APPROVED:	

SHEET TITLE: VISITOR CENTER - FOUNDATION SECTIONS II

DRAWING NUMBER: **FS-301**

SHEET OF

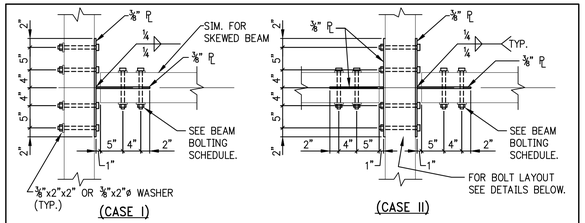


SECTION A-A

NOTE:
COORDINATE w/ ARCH DRAWINGS FOR MORE INFORMATION AT SLOPED BEAMS.

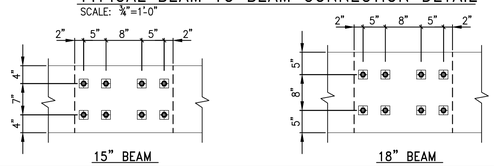
TYPICAL BEAM TO COLUMN AT INTERIOR COLUMN CONNECTION

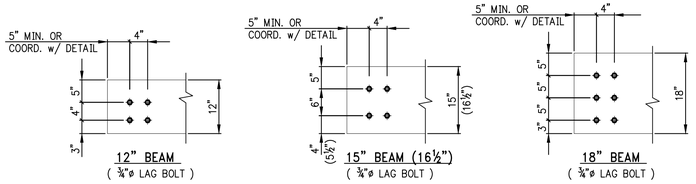
SCALE: ¾"=1'-0"



TYPICAL BEAM TO BEAM CONNECTION DETAIL

SCALE: ¾"=1'-0"





TYPICAL BEAM BOLTING SCHEDULE

SCALE: ¾"=1'-0"

CONNECTOR SCHEDULE

MARK	CONNECTOR
1	HUC210-3
2	HU5.125/13.5
3	HUCQ5.25/11-SDS
4	HUS212-2
5	HUCQ412-SDS
6	HGUS5.25/12
7	HUCQ412-SDS
8	(2) A33, (1) ON EACH SIDE OF 2x12 JOIST
9	(2) A33, (1) ON EACH SIDE OF 2x8 JOIST

NOTES:
1. CONNECTORS BY SIMPSON STRONG-TIE OR ENGINEER APPROVED EQUAL.
2. INSTALL CONNECTOR PER MANUFACTURER'S SPECIFICATIONS.
3. INSTALL ALL FASTENERS PER MANUFACTURER'S SPECIFICATIONS FOR ACHIEVING CONNECTOR'S MAXIMUM LOAD CAPACITY.

WOOD COLUMN SCHEDULE

LOCATION	COLUMN DIAMETER	LOCATION	COLUMN DIAMETER
A/6	12"	D.4/9	9"
A/7	12"	D.4/13	12"
A/8	12"	D.4/14	12"
A.9/13	12"	D.6/13	12"
A.9/14	12"	D.6/14	12"
B/6	12"	D.8/10	12"
B/7	12"	D.8/11	12"
B/8	12"	D.8/12	12"
C/1	12"	D.8/13	12"
C/2	12"	D.8/14	12"
C/3	12"	E/1	12"
C/4	12"	E/2	9"
C/5	12"	E/3	9"
C/6	12"	E/4	9"
C/7	12"	E/5	9"
C/8	12"	E/6	9"
C/9	12"	E/7	9"
C/10	12"	E/8	9"
C/11	12"	E/9	9"
C/12	12"	E/10	12"
C/13	12"	E/11	12"
C/14	12"	E/12	12"
C.5/13	12"	E/13	12"
C.5/14	12"	E/14	12"
C.7/6	12"		
C.7/7	12"		
C.7/8	12"		
C.9/13	12"		
C.9/14	12"		
D/1	12"		
D/2	12"		
D/3	12"		
D/4	12"		
D/5	12"		
D/6	12"		
D/7	12"		
D/8	12"		
D/9	12"		
D/10	12"		
D/11	12"		
D/12.5	12"		

1

NOTE:
ALL WOOD COLUMNS SHALL BE WHITE PINE, STRUCTURAL GRADE MINIMUM.
(Fc = 725 psi Min.
Fb = 975 psi Min.
Ft = 650 psi Min.
Fv = 125 psi Min.
Fc = 725 psi Min.
E = 1100 ksi Min.)

WOOD CONSTRUCTION NOTES:

1. WOOD MEMBERS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE NEW YORK STATE BUILDING CODE 2010.
2. ALL WOOD COLUMNS SHALL BE WHITE PINE STRUCTURAL GRADE MINIMUM. WOOD COLUMNS SHALL BE FURNISHED BY OWNER, INCLUDING ONSITE HARVESTING, TURNING, AND DRYING. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS, PREPARATION, FIELD CUTTING, INSTALLATION, AND FINISHING.
3. ALL GLUELAM WOOD BEAMS SHALL BE GLUELAM 24F1.8E MINIMUM, WITH BALANCED LAYUP.
4. ALL WOOD CONNECTORS SHALL BE SIMPSON STRONG-TIE OR APPROVED EQUIVALENT.
5. THE FRAME SHALL BE CARRIED UP TRUE AND PLUMB AND TEMPORARY BRACING SHALL BE INTRODUCED WHEREVER NECESSARY TO TAKE CARE OF ALL LOADS TO WHICH THE STRUCTURE MAY BE SUBJECTED, INCLUDING EQUIPMENT AND OPERATION OF SAME. SUCH BRACING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE LEFT IN PLACE AS LONG AS REQUIRED FOR SAFETY.
6. ALL CONTRACTORS PER CONTRACT ARE REQUIRED TO COORDINATE THEIR TRADE WILL ALL CONTRACT DRAWINGS.
7. WOOD BLOCKING, MAINTAIN 1" RECESS FROM FACE OF BEAM AND EDGE OF CONNECTOR PLATE, MATCH FINISH OF GLULAM, TYP.

CODES AND TESTS

1. THIS STRUCTURE HAS BEEN DESIGNED UNDER THE PROVISIONS OF THE NEW YORK STATE BUILDING CODE 2010.
2. ALL CONTROLLED CONCRETE SHALL COMPLY WITH THE LATEST A.C.I. 318-05 CODE. A SPECIAL AMENDMENT FORM FOR CONTROLLED CONCRETE WITH CONCRETE TESTS AND CURVES OF TESTS FOR THE PRELIMINARY DESIGN MIX PREPARED BY AN APPROVED LABORATORY MUST BE SUBMITTED TO THE ENGINEER FOR FILING WITH THE BUILDING DEPARTMENT. NO CONCRETE IS TO BE PLACED BEFORE SUCH AN AMENDMENT IS APPROVED BY THE BUILDING DEPARTMENT.
3. DESIGN AND CONSTRUCTION OF FORMWORK IS TO COMPLY WITH THE LATEST A.C.I. 318-05 CODE.
4. TRANSPORTING, PLACING, CURING AND DEPOSITING OF CONCRETE SHALL COMPLY WITH ALL APPLICABLE CODES.

WIND DESIGN DATA:

WIND PRESSURES ARE IN ACCORDANCE WITH THE NEW YORK STATE BUILDING CODE IN EFFECT AS OF 2009, WITH THE FOLLOWING FACTORS:

i. BASIC WIND SPEED = 90 MPH
ii. WIND IMPORTANCE FACTOR, I_w = 1.0
iii. WIND EXPOSURE: C
iv. INTERNAL PRESSURE COEFFICIENT, GC_{pi} = +0.18 & -0.18
v. WIND PRESSURE FOR COMPONENTS AND CLADDING:
1. WALLS: PRESSURE = 18 psf SUCTION = 25 psf
2. ROOFS:
a) INTERIOR ROOF AREA: PRESSURE = 10 psf SUCTION = 18 psf
b) PERIMETER ROOF AREA (WITHIN 5'-0" OF EXTERIOR WALLS): PRESSURE = 10 psf SUCTION = 31 psf
c) CORNER OF PERIMETER ROOF AREA (WITHIN 5'-0" OF EXTERIOR WALLS): PRESSURE = 10 psf SUCTION = 45 psf

ROOF SNOW LOAD:

1. FLAT ROOF SNOW LOAD, P_f = 20 PSF
2. SNOW EXPOSURE FACTOR, C_e = 1.0
3. SNOW LOAD IMPORTANCE FACTOR, I = 1.0
4. THERMAL FACTOR, C_t = 1.00

EARTHQUAKE DESIGN DATA:

i. a) OCCUPANCY IMPORTANCE FACTOR, I_e : 1.0
b) SEISMIC USE GROUP: I
c) SITE CLASS: E
d) SEISMIC DESIGN CATEGORY: C
ii. MAPPED SPECTRAL RESPONSE ACCELERATIONS:
Ss = 0.240 g
S_1 = 0.085 g

LOADING SCHEDULE

FLOOR \ LOAD	ROOF PANEL (PSF)	FILL & FINISHES GREEN ROOF (PSF)	CEILING & HANG. (PSF)	PARTITION	TOTAL DEAD LOAD (PSF)	TOTAL LIVE LOAD (PSF)	REMARKS
GREEN ROOF w/ SIPS ROOF PANEL	4	30	5	0	39	30 *, **	
NON-GREEN ROOF w/ PLYWOOD PANEL	4	15	5	0	24	30 **	

* CHECK FOR ACTUAL SOLAR PANEL LOAD
** CHECK FOR SNOW DRIFT

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CONTRACT: CONSTRUCTION

TITLE: PROVIDE VISITOR BUILDING AND SITE IMPROVEMENTS

LOCATION: FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER
56 GAME FARM ROAD, DELMAR, NY

CLIENT: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

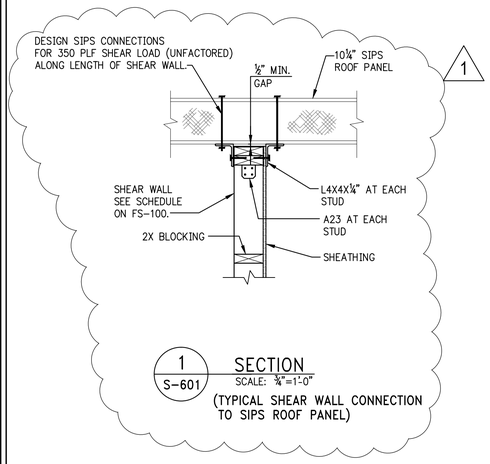
MARK	DATE	DESCRIPTION
1	07/09/2015	ADDENDUM #5
	02/18/2015	BID DOCUMENT

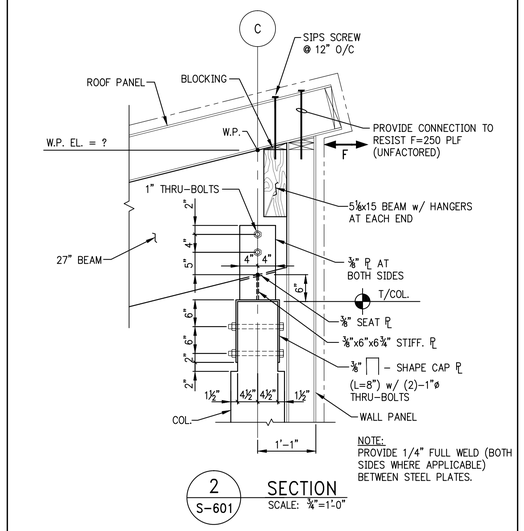
PROJECT NUMBER: 43153-C
DESIGNED BY:
DRAWN BY:
FIELD CHECK:
APPROVED:

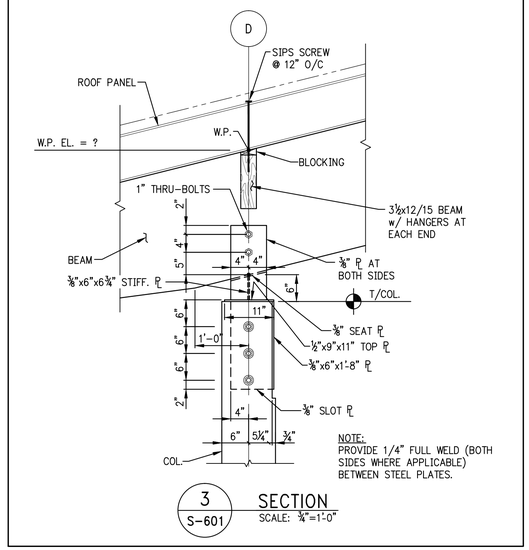
SHEET TITLE:
VISITOR CENTER - TYP. SUPERSTRUCTURE DETAILS & NOTES - SHEET 1

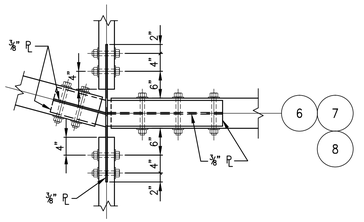
DRAWING NUMBER:
S-600

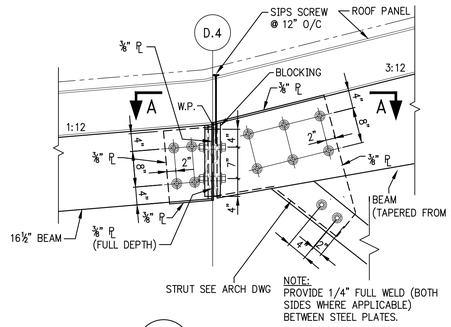
SHEET OF











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	02/18/2015	BID DOCUMENT

PROJECT NUMBER:	43153-C
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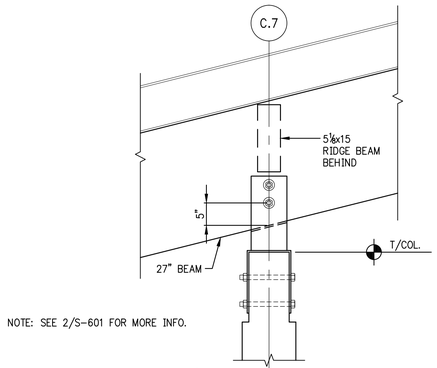
DRAWN BY:	
FIELD CHECK:	
APPROVED:	

SHEET TITLE:
VISITOR CENTER
SUPERSTRUCTURE DETAILS & NOTES – SHEET 2

DRAWING NUMBER:
S-601

SHEET 36 OF 65



8 / S-602 SECTION
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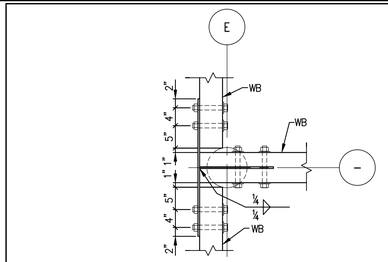
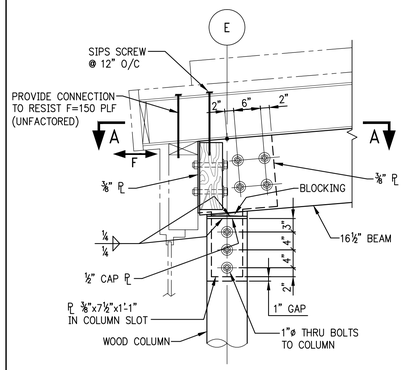


SECTION A-A



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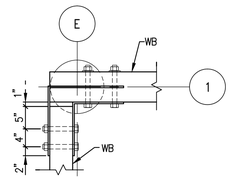
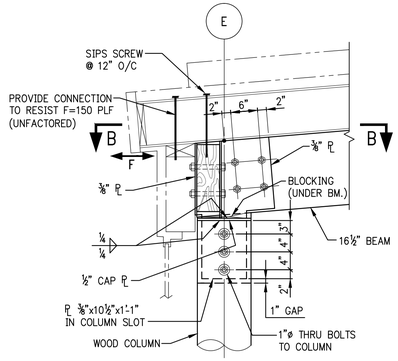


SECTION B-B



9A / S-602 SECTION
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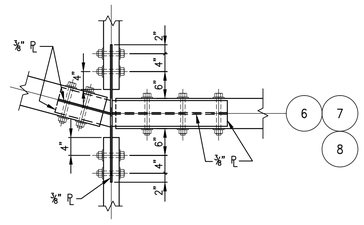

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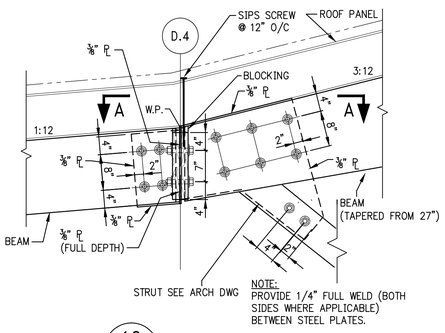

10 / S-601 SECTION
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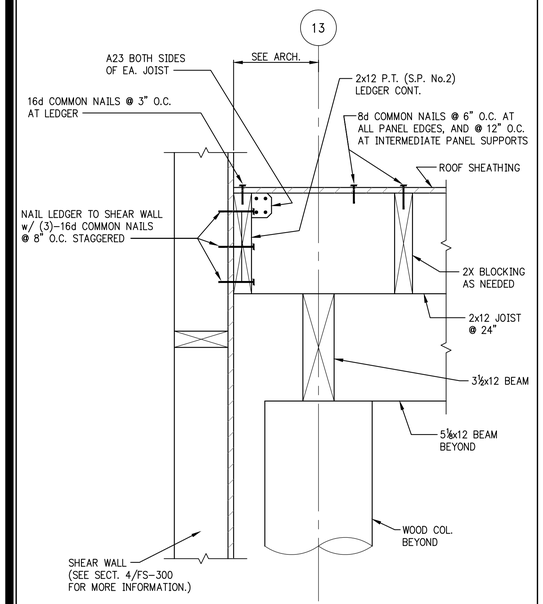
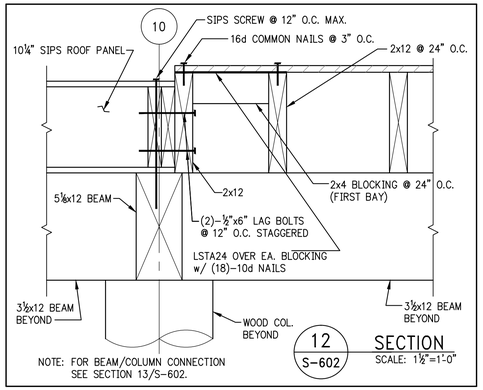
(AT GRID LINES 6, 7 & 8 ONLY)



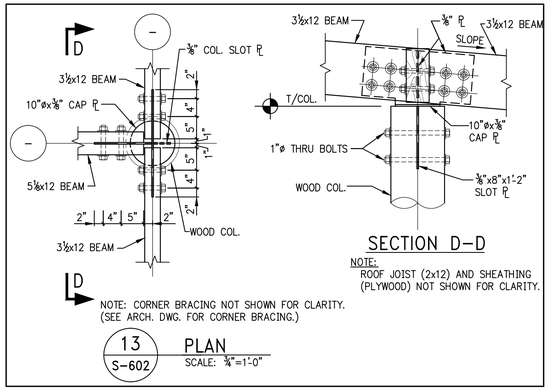
NOTE: FOR BEAM/COLUMN CONNECTION SEE SECTION 13/S-602.

11 / S-602 SECTION
SCALE: 1½"=1'-0"



NOTE: FOR BEAM/COLUMN CONNECTION SEE SECTION 13/S-602.

12 / S-602 SECTION
SCALE: 1½"=1'-0"

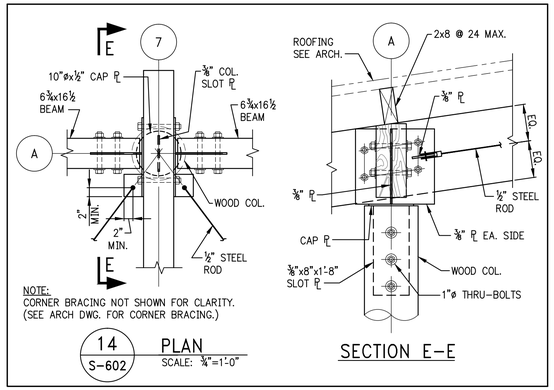


NOTE: CORNER BRACING NOT SHOWN FOR CLARITY. (SEE ARCH. DWG. FOR CORNER BRACING.)

13 / S-602 PLAN
SCALE: ¾"=1'-0"

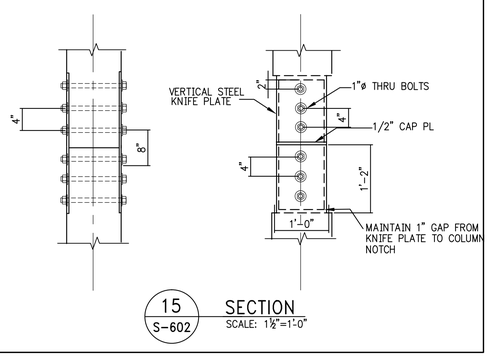
SECTION D-D

NOTE: ROOF JOIST (2x12) AND SHEATHING (PLYWOOD) NOT SHOWN FOR CLARITY.

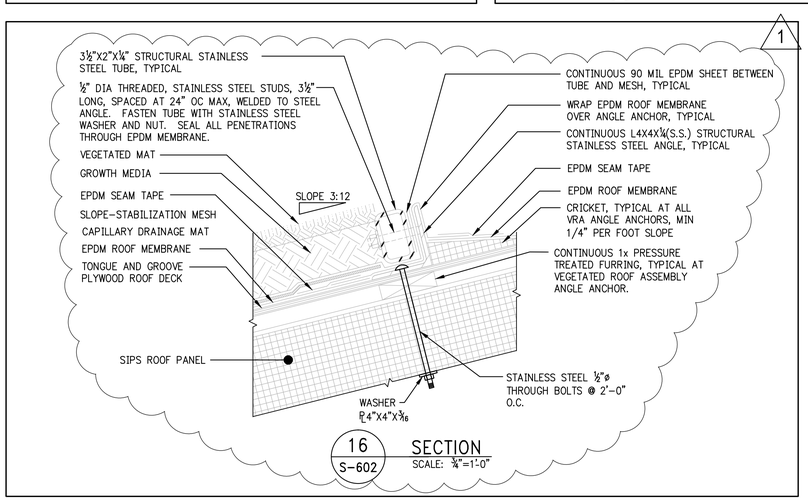


14 / S-602 PLAN
SCALE: ¾"=1'-0"

SECTION E-E



15 / S-602 SECTION
SCALE: 1½"=1'-0"



16 / S-602 SECTION
SCALE: ¾"=1'-0"

NYS OFFICE OF GENERAL SERVICES
Serving New York
ANDREW M. CUOMO
Governor
ROANN M. DESTITO
Commissioner

CONSULTANT

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STRUCTURAL ENGINEERING
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New York, NY 10017

CIVIL ENGINEER & LANDSCAPE DESIGN
M.J. Engineering & Land Surveying, PC
1533 Crescent Road
Clifton Park, New York 12065

EXHIBIT DESIGN
Amaze Design
77 North Washington Street
Boston, MA 02114

CONTRACT: CONSTRUCTION

TITLE: PROVIDE VISITOR BUILDING AND SITE IMPROVEMENTS

LOCATION: FIVE RIVERS ENVIRONMENTAL EDUCATION CENTER
56 GAME FARM ROAD, DELMAR, NY

CLIENT: NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MARK	DATE	DESCRIPTION
1	07/09/2015	ADDENDUM #5
	02/18/2015	BID DOCUMENT

PROJECT NUMBER:	43153-C
DESIGNED BY:	
DRAWN BY:	
FIELD CHECK:	
APPROVED:	

SHEET TITLE:
VISITOR CENTER - TYP. SUPERSTRUCTURE DETAILS & NOTES - SHEET 3

DRAWING NUMBER:
S-602

SHEET OF