

Additions & Renovations at Robert Poole Building #56
Maryland Stadium Authority
Baltimore City Public Schools
JRS Architects
June 7, 2016

ADDENDUM #6

This Addendum is issued pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

ATTACHMENTS

This Addendum includes the following attached Sketches:

AAD 6.01 Gym Soffit, 6/7/16
AAD 6.02 Seat Riser, 6/7/16
SK-M2 Details – Mechanical, 6/9/16
SK-M2 Details – Mechanical, 6/9/16

This Addendum includes the attached Specification Sections:

074293 Soffit Panels, 5/31/16
329113 Soil Preparation, 6/10/16

REVISION TO TABLE OF CONTENTS

ADD: 074293 Soffit Panels, 5/31/16

REVISIONS TO DIVISIONS 02 - 16 SPECIFICATION SECTIONS

Section	Paragraph	Change
050374	2.1.C.1	At the end of the sentence ADD: “or Silicon Bronze ASTM B198.”
062023	1.2.A	ADD: “2. Solid phenolic window sill panels.”
062023		ADD: “1.8 WARRANTY A. Manufacturer’s Warranty: Provide manufacturer’s standard warranty against defects in manufacturing.”
062023		ADD: “2.7 SOLID PHENOLIC CORE LAMINATE PANELS A. Manufacturer: Subject to conformance with the specification requirements, provide products by one of the following: a. Formica, Inc. b. Panolam Industries International, Inc. c. Trespa d. Wilsonart B. Panels shall comply with the following: 1. Laminate Material: Complies with NEMA LD3 for Type CGS high pressure laminates. 2. Standard Grade: Compact laminate with black core and finish options selected. 3. Sheet Thickness: 1 inch thickness with a tolerance of plus or minus 5 percent. 6. Sheet Width: As selected from manufacturer’s standard widths. 7. Sheet Length: As selected from manufacturer’s standard lengths. 8. Color and Finish: Matte finish, color as selected by Architect from manufacturer’s full range. 9. Adhesive: adhesive as recommended by manufacturer. 10. Edge Finishing: Finish per manufacturer’s recommended practice to achieve smooth

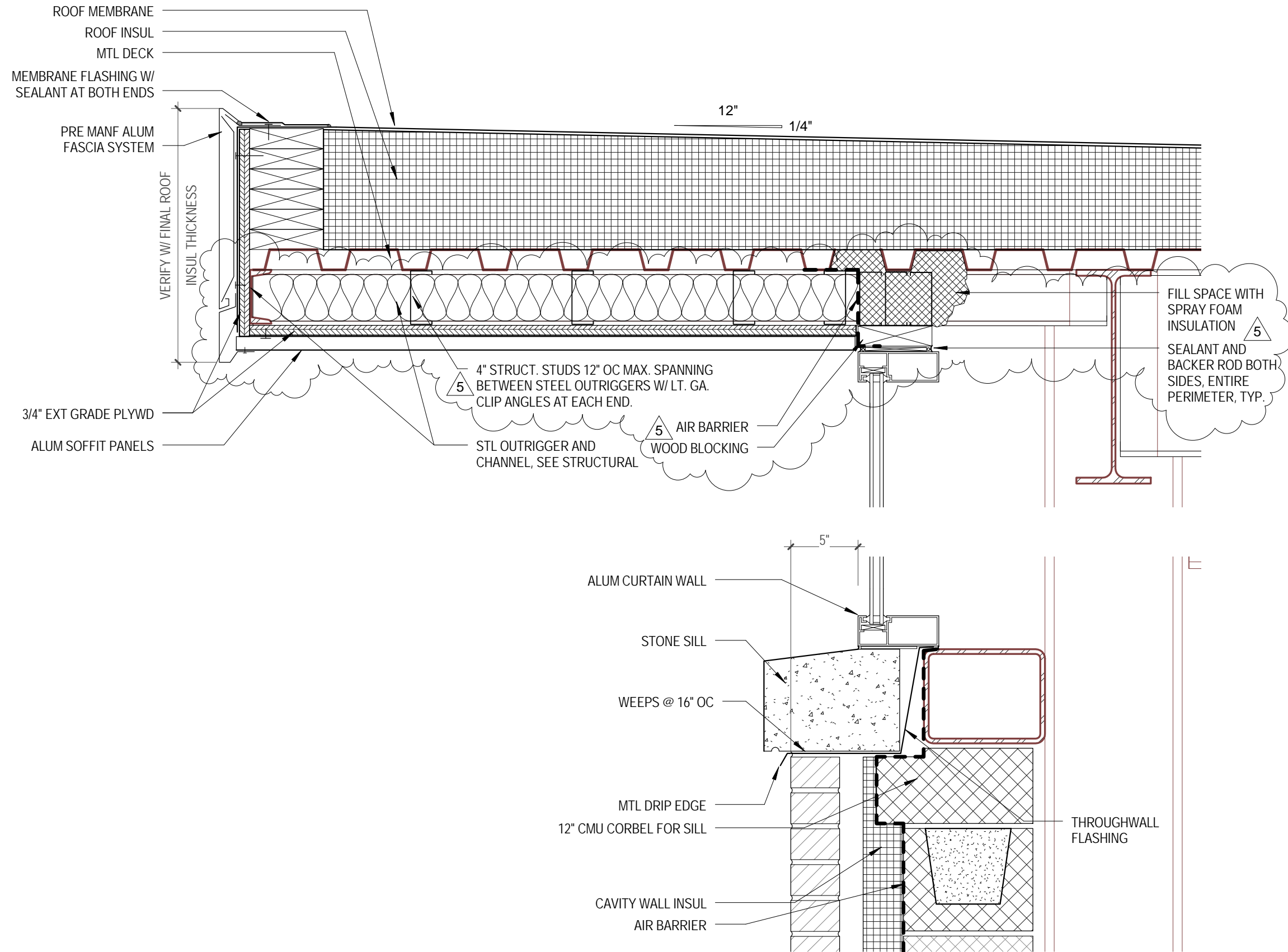
		finish at exposed edges.”
062023		ADD: “3.9 SOLID PHENOLIC INSTALLATION A. Install products in strict accordance with manufacturer’s instructions and approved submittals. 1. Clean substrate of dirt, dust, waxes, and other bond breaking substances prior to beginning installation. 2. Follow adhesive manufacturer’s recommendations for set and application times. 3. Apply pressure to entire panel face with laminate type roller, removing trapped air and ensure proper adhesion between surfaces. B. Replace installations out of plumb and not aligned with adjacent panels and construction. C. Clean panel face to remove soiling, stains, dust, and dirt using clean rags, and cleaning agents as instructed by manufacturer. D. Leave installation clean, free of residue and debris resulting from work of this Section.”
074293		ADD: Section 074293, Soffit Panels, 5/31/16, in its entirety, attached.
221413		ADD: “ 2.5 FOUNDATION DRAIN PIPING A. Solid-Wall high density polyethylene pipe: ASTM D 3350, smooth wall drainage pipe with two rows of holes at 120°. Bell and spigot joints. 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following: a. Advance Drainage Systems (ADS), Inc. b. Approved Equal B. Fittings: High density polyethylene, ASTM D 3350, smooth wall pipe for bell and spigot joints.”
221413	3.1	ADD: “ U. Install underground high density polyethylene piping according to ASTM D 2321 and manufacturer’s recommended installation guidelines for foundation drainage.”
221413	3.10	ADD: “ E. Underground, foundation drainage piping NPS 4 (DN 100) shall be any of the following: 1. Hub-and-spigot, high density polyethylene pipe and fittings.”
233113	3.10	DELETE Article 3.10, Duct Cleaning, in its entirety.
329113		DELTE Section in its entirety and ADD: 329113 Soil Preparation, 6/10/16.

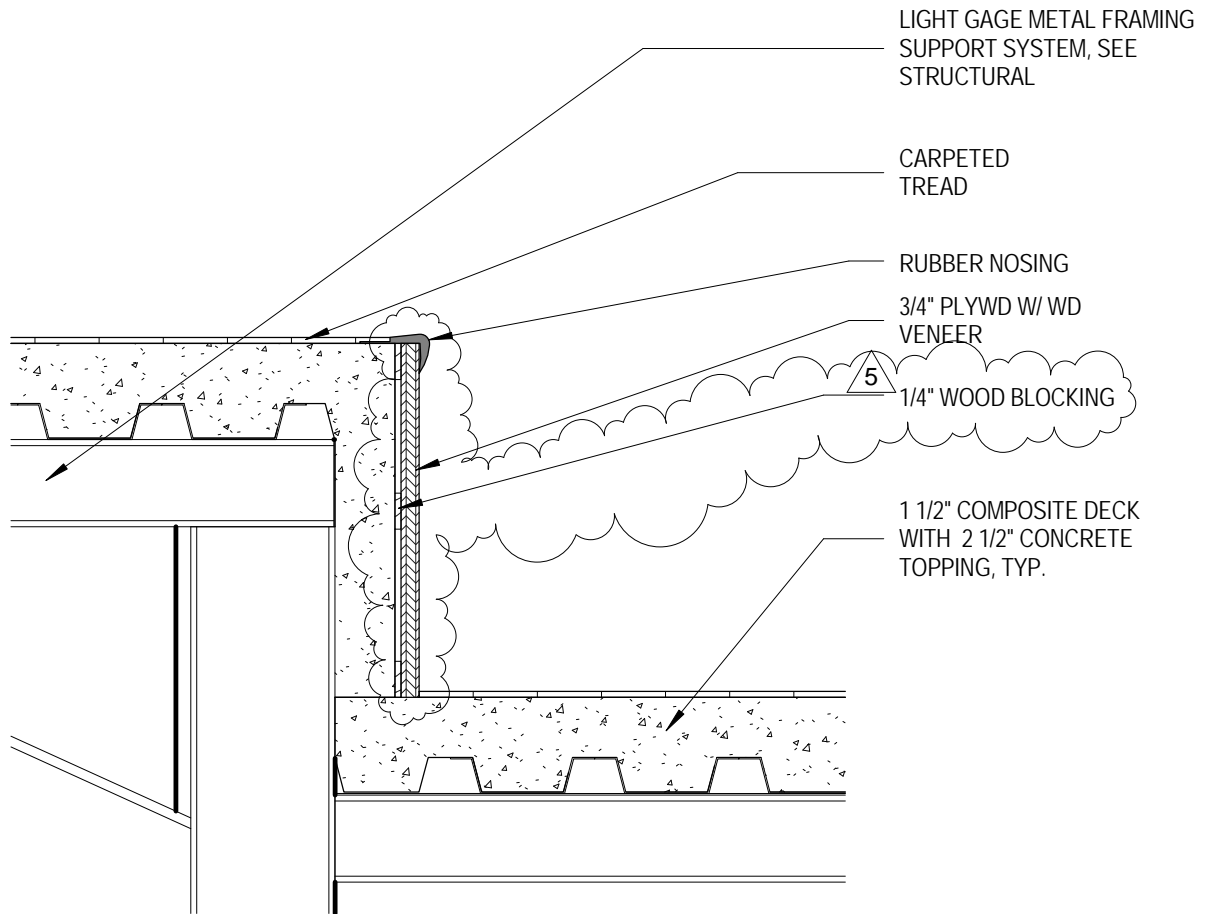
REVISIONS TO DRAWING SHEETS

Drawing	Location	Change
L 106	6	DELETE Detail 6 Bollard Mounting (Embedded). ADD Note that Detail 6 is similar to Steel/Concrete Bollard Detail on C-5.02 except that the bollard is to be painted black instead of yellow.
A 111, A 113, A 114, A 116, A 118	Building Alteration Note 2	After “(Min. 3000psi”, ADD: “with 6x6 W1.4xW1.4 mesh reinforcing”, typical all sheets.
A 401	Sections 2, 3, 4, and 5	At Note, after: “New 3-1/2”+/- cementitious fill (3000 psi min.)”, ADD: “with 6x6 W1.4xW1.4 mesh reinforcing”. This is typical at all instances of this note.
A 412	5	Revise Section as shown on the attached sketch, AAD 6.01.
A 508	5	Revise Section as shown on the attached sketch, AAD 6.02.

A 602	Door Schedule	At Door 001B-1, REVISE Door Type to "FG", DELETE Door Rating.
M 503		ADD: Coil Connection Detail as shown on the attached sketch SK-M2.
M 600		ADD: Columns EER and COP to Ground Source Heat Pump schedule as shown on the attached sketch SK-M1.

END OF ADDENDUM 6





1
AAD
6.02

TYPICAL SEAT RISER ADD 6

SCALE: 1 1/2" = 1'-0"

JRS ARCHITECTS

2010 Clipper Park Rd.
Suite 101
Baltimore, MD 21211

410.235.7256

Baltimore City Public Schools

DATE: 06/7/16

CHANGE TO DRAWING:

REV:

5

**Additions & Renovations at Robert Poole
Building #056**

1300 W 36TH ST., BALTIMORE, MD 21211

DRAWING NO.:

AAD 6.02

SCALE: 1 1/2" = 1'-0"

SEAT RISER

GROUND SOURCE HEAT PUMPS

EER	COP	EER	COP
15.5	5.2	18.6	6.7
15.3	4.8	18.6	6.7
15.3	4.8	14.9	5.4
18.3	6.44	15.3	4.8
16.7	5.1	15.5	5.2
15.3	4.8	15.3	4.8
18.3	6.44	14.9	5.4
14.9	5.4	15.5	5.2
15	4.9	15.5	5.2
15.5	5.2	16.7	5.1
15.3	4.8	15.3	4.8
15.3	4.8	14.9	5.4
15	4.9	18.3	6.44
15.3	4.8	16.7	5.1
15.3	4.8	16.7	5.1
15	4.9	15.8	5.85
15.8	5.85	14.9	5.4
18.3	6.44	14.9	5.4
14.8	5.3	16.7	5.1
18.3	6.44	15.8	5.85
16.7	5.1	16.7	5.1
15.3	4.8	16.7	5.1
18.3	6.44	16.7	5.1
16.7	5.1	16.7	5.1
18.6	6.7	16.7	5.1
18.6	6.7	18.3	6.44
15	4.9	16.7	5.1
15	4.9	16.7	5.1
15	4.9	15.3	4.8
15.8	5.85	15.5	5.2
16.7	5.1	16.7	5.1
16.7	5.1	18.3	6.44
18.6	6.7	18.3	6.44
15.3	4.8	18.3	6.44
15	4.9	18.3	6.44
15.5	5.2	15.8	5.85
14.8	5.3	15.8	5.85
14.8	5.3	15.8	5.85
14.8	5.3	18.6	6.7
15.3	4.8	18.3	6.44
18.3	6.44	18.3	6.44
16.7	5.1	18.3	6.44
16.7	5.1	18.3	6.44
15.3	4.8	18.3	6.44

JRS ARCHITECTS

2010 Clipper Park Rd., Suite 101
Baltimore, MD 21211
ph: 410.235.7256

Baltimore City Public Schools

DATE: 06/09/16

SCHEDULES - MECHANICAL

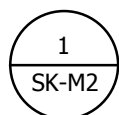
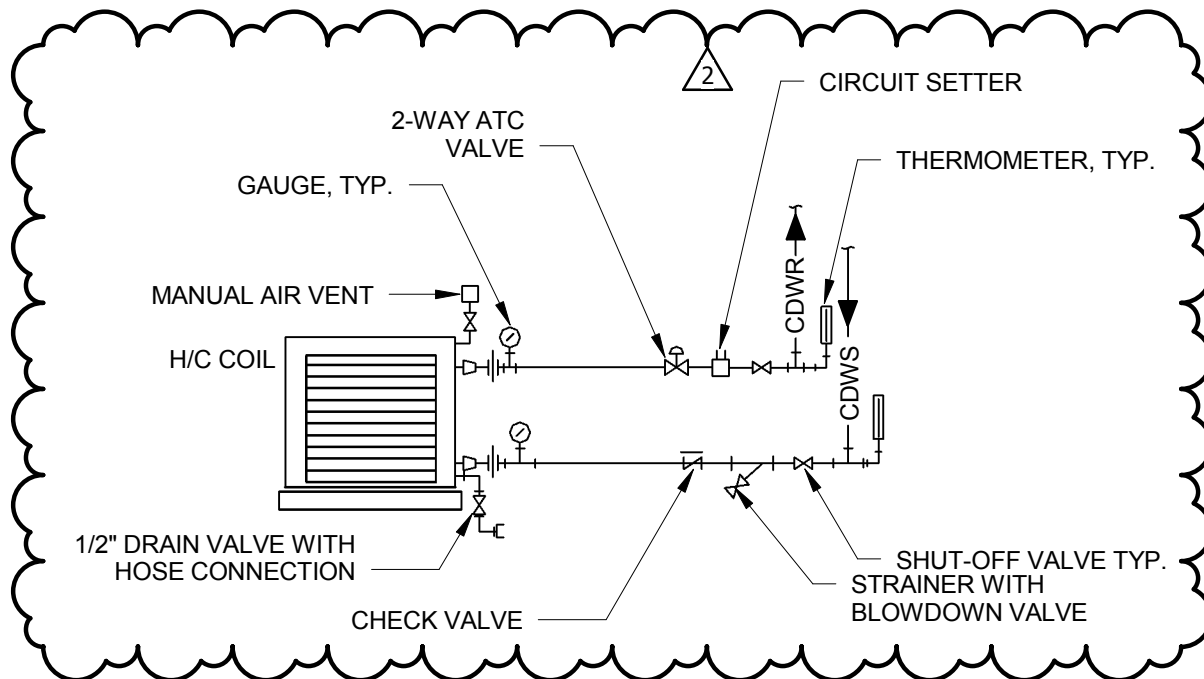
1300 W 36TH ST., BALTIMORE, MD 21211

SK-M1

SCALE: 12" = 1'-0"

ADDITIONS & RENOVATIONS AT ROBERT POOLE BUILDING #056

CHANGE TO DRAWING: 1



COIL CONNECTION DETAIL

NO SCALE

JRS ARCHITECTS

2010 Clipper Park Rd.
Suite 101
Baltimore, MD 21211

410.235.7256

Baltimore City Public Schools

**Additions & Renovations at Robert Poole
Building #056**

1300 W 36TH ST., BALTIMORE, MD 21211

DATE: 06/09/16

CHANGE TO DRAWING:

REV:

2

DRAWING NO.:

SK-M2

SCALE: NO SCALE"

**DETAILS -
MECHANICAL**

SECTION 074293 - SOFFIT PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes metal soffit panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
- C. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
- D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.
- E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 INFORMATIONAL SUBMITTALS

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

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

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

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 FIELD CONDITIONS

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

1.9 COORDINATION

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

1.10 WARRANTY

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL SOFFIT PANELS

- A. General: Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile Metal Soffit Panels: Solid panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CENTRIA Architectural Systems
 - b. Drexel Metals
 - c. MBCI; a division of NCI Group, Inc.
 - d. Merchant & Evans Inc.
 - e. Metal Fab Manufacturing
 - f. Petersen Aluminum Corporation.
 - 2. Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
 - a. Thickness: 0.032 inch.
 - b. Surface: Smooth, flat finish.
 - c. Exterior Finish: Three-coat fluoropolymer .
 - d. Color: As selected by Architect from manufacturer's full range.
 - 3. Panel Coverage: 12 inches.
 - 4. Panel Height: 1.0 inch.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

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

5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal soffit panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Aluminum Panels and Accessories:
 1. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
 - 1. Soffit Framing: Wire tie furring channels to supports.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
 - 1. Apply panels and associated items true to line for neat and weathertight enclosure.
 - 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 - 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 - 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

- E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
 - 1. Install exposed flashing and trim that is without buckling, and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

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

END OF SECTION 074293

SECTION 329113 - SOIL PREPARATION

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 planting soils specified by composition of the mixes for the site for areas to receive planting and defined by the top layer of soil in depths indicated.
- B. Related Requirements:
 - 1. Section 129300 "Site Furnishings" for placing planting soil in exterior unit planters.
 - 2. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
 - 3. Section 329200 "Turf and Grasses" for placing planting soil for grasses.
 - 4. Section 329300 "Plants" for placing planting soil for plantings.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.4 DEFINITIONS

- A. AAPFCO: Association of American Plant Food Control Officials.
- B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or unamended soil as indicated.
- C. CEC: Cation exchange capacity.
- D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.
- E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- F. Imported Soil: Soil that is transported to Project site for use.
- G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

- H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.
- J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."
- K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.
- M. SSSA: Soil Science Society of America.
- N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- Q. USCC: U.S. Composting Council.

1.5 PREINSTALLATION MEETINGS

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

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include recommendations for application and use.
 - 2. Include test data substantiating that products comply with requirements.
 - 3. Include sieve analyses for aggregate materials.
 - 4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:
 - a. Manufacturer's qualified testing agency's certified analysis of standard products.

- b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
- c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Sustainable Design Submittals:

- 1. **Product Certificates:** For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.

- C. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For each testing agency.
- B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.
- C. Field quality-control reports.

1.8 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil and imported soil.
 - 1. Notify Architect and Owner seven days in advance of the dates and times when laboratory samples will be taken.
- B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
 - 1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.10 SOIL-SAMPLING REQUIREMENTS

- A. General: Extract soil samples according to requirements in this article.
- B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Architect under the direction of the testing agency.
 - 1. Number and Location of Samples: Minimum of three representative soil samples from varied locations for each existing soil, imported soil and each manufactured planting soil mix to be used for landscaping purposes.
 - 2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
 - 3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
 - 4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.
 - 5. Soils samples and collection shall be prepared and dated within 3 months of the soils use on site. Soil samples and reports dated prior within 3 months use on site shall be rejected.

1.11 TESTING REQUIREMENTS

- A. General: Perform tests on soil samples according to requirements in this article.
- B. Physical Testing:
 - 1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
 - a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
 - b. Hydrometer Method: Report percentages of sand, silt, and clay.
 - 2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
 - 4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).
- C. Chemical Testing:
 - 1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
 3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
 4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.
- D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13, including the following:
1. Percentage of organic matter.
 2. CEC, calcium percent of CEC, and magnesium percent of CEC.
 3. Soil reaction (acidity/alkalinity pH value).
 4. Buffered acidity or alkalinity.
 5. Nitrogen ppm.
 6. Phosphorous ppm.
 7. Potassium ppm.
 8. Manganese ppm.
 9. Manganese-availability ppm.
 10. Zinc ppm.
 11. Zinc availability ppm.
 12. Copper ppm.
 13. Sodium ppm and sodium absorption ratio.
 14. Soluble-salts ppm.
 15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
 16. Other deleterious materials, including their characteristics and content of each.
- E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
- F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.
1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inchdepth of soil.
 2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inchdepth of soil.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Do not move or handle materials when they are wet or frozen.
 - 4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Regional Materials:** Imported soil, manufactured planting soil and soil amendments and fertilizers shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.2 PLANTING SOILS SPECIFIED BY COMPOSITION

- A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.
- B. Planting-Soil Type A-2 Inch Depth: Existing, on-site surface soil, with the duff layer, if any, retained; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
 - 1. Ratio of Loose Compost to Soil: 1:4 by volume.
- C. Planting-Soil Type A- 2 Inch Depth, B 6 Inch Depth, C 12 Inch Depth may be sourced by the following means:
 - 1. Manufactured soil consisting of manufacturer's basic sandy loam according to USDA textures, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.
 - a. Additional Properties of Manufacturer's Basic Soil before Amending: Soil reaction of pH 6 to 7 and minimum of 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.

- b. Unacceptable Properties: Manufactured soil shall not contain the following:
 - 1) Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - 2) Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
 - 3) Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/2 inches in any dimension.
 - c. Blend manufacturer's basic soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
 - 1) Ratio of Loose Compost to Soil: 1:4 by volume.
2. Imported, naturally formed soil from off-site sources and consisting of sandy loam soil according to USDA textures; and modified to produce viable planting soil.
- a. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from agricultural land, bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and brome grass.
 - b. Additional Properties of Imported Soil before Amending: Soil reaction of pH 6 to 7 and minimum of 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
 - c. Unacceptable Properties: Imported soil shall not contain the following:
 - 1) Unacceptable Materials: oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - d. Unacceptable Properties: Clean soil of the following:
 - 1) Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris and other extraneous materials that are harmful to plant growth.
 - 2) Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 6 percent by dry weight of the imported soil.
 - 3) Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/2 inches in any dimension.
 - e. Amended Soil Composition: Blend imported, unamended soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
 - 1) Ratio of Loose Compost to Soil: 1:4 by volume.

- D. Planting-Soil Type D- Agricultural Planting Soil: Manufactured soil consisting of manufacturer's organic loam according to USDA textures, blended in a manufacturing facility, stabilized organic soil amendments, and other materials to produce viable planting soil.
1. Additional Properties of Manufacturer's Basic Soil before Amending: Soil reaction of pH 6 to 7 and minimum of 10 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
 2. Unacceptable Properties: Manufactured soil shall not contain the following:
 - a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
 - b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 5 percent by dry weight of the manufactured soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1-1/2 inches in any dimension.
 3. Blend manufacturer's basic soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
 - a. Ratios:
 - 1) Compost 1 part, 2 different sources mixed uniformly
 - 2) Rice Hulls: 1 part
 - 3) Leaf Compost: 1 part
 - 4) Loam Soil: 1part

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
 2. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
 3. Form: Provide lime in form of ground dolomitic limestone or mollusk shells.
- B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Perlite: Horticultural perlite, soil amendment grade.

- E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 sieve.
- F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
 - 1. Feedstock: Limited to native tree leaves, Rice Hulls, Coffee Grinds, Tea.
 - 2. Reaction: pH of 6 to 8.
 - 3. Soluble-Salt Concentration: Less than 1 dS/m.
 - 4. Moisture Content: 40 to 60 percent by weight.
 - 5. Organic-Matter Content: 50 to 60 percent of dry weight.
 - 6. Particle Size: Minimum of 98 percent passing through a 1/2-inch sieve.
- B. Wood Derivatives: Shredded and composted, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
- C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth. Certified organic sources only.

2.5 FERTILIZERS

- A. Organic fertilizers: Wet or Dry soil amendment derived from natural sources that indicates a minimum percentage of nitrogen phosphate and potash.
 - 1. Products approved by the Organic Materials Review Institute shall be used for the appropriate crop or plant type.
 - 2. Nutrient Composition for bidding purposes: 20 percent nitrogen, 0 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.
 - 3. Nutrient Composition for application purposes: Based upon soil test report recommendations for each plant type.

PART 3 - EXECUTION

3.1 GENERAL

- A. Place planting soil and fertilizers according to requirements in other Specification Sections.
- B. 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 planting soil.

- C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

- A. Excavation: Excavate soil from designated area(s) to a depth of 2 inches and stockpile until amended.
- B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
- C. Unsuitable Materials: Clean soil to contain a maximum of 5 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.
- D. Screening: Pass unamended soil through a 2-inch sieve to remove large materials.

3.3 PLACING IMPORTED, AMENDED AND MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE

- A. General: Apply imported amended and manufactured soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Subgrade Preparation: Till subgrade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Apply approximately half the thickness of planting soil over prepared, loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.
- C. Application: Spread planting soil to total depth of 2 inches of 6 inches of 12 inches as indicated in soil type designations above, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
 - 1. Lifts: Apply planting soil in lifts not exceeding 6 inches in loose depth for material compacted by compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- D. Compaction: Compact each lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 BLENDING PLANTING SOIL IN PLACE

- A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.
- B. Preparation: Till unamended, existing soil in planting areas to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Apply soil amendments and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.
 - 1. Mix lime and sulfur with dry soil before mixing fertilizer, as required by soil test recommendations..
 - 2. Mix fertilizer with planting soil no more than seven days before planting.
- D. Compaction: Compact blended planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.
- E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 - 1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D 698. Space tests at no less than one for each 1000 sq. ft. of in-place soil or part thereof.
- C. Soil will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.6 PROTECTION

- A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."
- B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
 2. Parking vehicles or equipment.
 3. Vehicle traffic.
 4. Foot traffic.
 5. Erection of sheds or structures.
 6. Impoundment of water.
 7. Excavation or other digging unless otherwise indicated.
- C. If planting soil or subgrade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.7 CLEANING

- A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.
- B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION 329113