

Coca Cola Distribution Facility Amarillo, Texas



ARCHITECTURAL ADDENDUM #2

DATE: February 11, 2014
FROM: Lavin Associates, Architects
TO: Plan Holders of Record
PROJECT: Coca Cola Distribution Facility



This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated January 22-2014. Work not specifically deleted, modified, changed or altered by the Addendum should remain in effect as part of the Contract Documents. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject Bidder to disqualification.

IN THE PROJECT MANUAL:

- 1. Proposal Form:**
Insert the revised Proposal Form (attached).
- 2. Section 01210 Allowances:**
Insert the new Section 01210 Allowances (attached).
- 3. Section 03300 Concrete**
Insert the revised Section 03300 Concrete (attached).
- 4. Section 05120 Structural Steel**
Insert the new Section 05120 Structural Steel (attached).
- 5. Section 07417 Insulated Metal Panels**
Insert the revised Section 07417 Insulated Metal Panels (attached).
- 6. Section 07543 TPO Roofing.**
Insert the revised Section 07543 TPO Roofing (attached).
- 7. Section 08410 Aluminum Entrances and Storefronts**
Insert the revised Section 08410 Aluminum Entrances & Storefronts (attached)
- 8. Section 08920 Aluminum Curtain Walls**
Insert the new Section 08920 Aluminum Curtain Walls (attached).
- 9. Section 09705 Resinous Flooring**
Insert the revised Section 09705 Resinous Flooring (attached).
- 10. Section 11160 Loading Dock Equipment**
Insert the revised Section 11160 Loading Dock Equipment (attached).

IN THE DRAWINGS:

- 11. Sheet G.0 Graphics Package** insert the revised sheet G.0 dated 2-11-14.
- 12. Sheet G.2 Graphics Package** insert the revised sheet G.2 dated 2-11-14.
- 13. Sheet A1.01 Site Plan** insert the revised sheet A1.02 dated 2-11-14.
- 14. Sheet A1.02 Site Details** insert the revised sheet dated 2-11-14.
- 15. Sheet A1.05, Checker Building Site Plan** insert new sheet A1.05 dated 2-11-14.
- 16. Sheet A2.02, Partial Floor Plan** insert revised sheet A2.02 dated 2-11-14.
- 17. Sheet A2.03, Partial Floor Plan** insert revised sheet A2.03 dated 2-11-14.
- 18. Sheet A2.05, Checker Building** insert revised sheet A2.05 dated 2-11-14.
- 19. Sheet A2.06, Finish Schedule** insert revised sheet A2.06 dated 2-11-14.
- 20. Sheet A3.01, Door & Window Schedule** insert revised sheet A3.01 dated 2-11-14.
- 21. Sheet A3.02 Door & Window Details** insert revised A3.02 dated 2-11-14.
- 22. Sheet A4.01 Exterior Elevations** insert revised sheet A4.01 dated 2-11-14
- 23. Sheet A5.01, Wall Sections** insert revised sheet A5.01 dated 2-11-14.
- 24. Sheet A5.02, Wall Sections** insert revised sheet A5.02 dated 2-11-14.

Coca Cola Distribution Facility Amarillo, Texas



- 25. Sheet A5.03, Wall Sections insert revised sheet A5.03 dated 2-11-14.
- 26. Sheet A6.01 Interior Elevations insert revised sheet A6.01 dated 2-11-14

**SEE ADDITIONAL ITEMS ON CIVIL, MECHANICAL, ELECTRICAL, MECHANICAL AND PLUMBING
ADDENDA.**

END OF ARCHITECTURAL ADDENDUM NO. 2

(Contractor's Letterhead)

COMPETITIVE SEALED PROPOSAL FORM
FOR
TH NEW COCA COLA DISTRIBUTION CENTER

Amarillo, Texas
FOR
THE AMARILLO ECONOMIC DEVELOPMENT CORPORATION

GENTLEMAN,

The undersigned, has carefully examined the Contract Documents, Conditions of the Contract, the Specifications and the Drawings, and any addenda to the Drawings and Specifications as prepared by Lavin Associates, Inc., the site, premises and all conditions affecting the work on the project listed above. The undersigned proposes to furnish all labor, materials, services and equipment necessary to complete the entire work in strict accordance with the above documents for the following sum:

Base Proposal Amount

_____ Dollars \$

Total Proposal Amount

_____ Dollars \$

Construction Time

_____ Calender Days

Alternates

Alternate No. One:

_____ Add/Deduct Dollars \$

Acknowledge Addendum No(s)

ADDENDUM NO.

DATED

If the undersigned is notified of the acceptance of this proposal within thirty (30) days after delivery of this Proposal, he agrees and pledges to be Substantially Complete on the entire work on or before the dates scheduled in the Project Manual. If the work is not complete by the stipulated date, the Contractor and/or his Surety shall be liable for and shall pay to the Owner for each calendar day of delay beyond the scheduled dates until the work is Substantially Completed the amount stipulated in the contract documents.

Subcontractors: The Base Proposal is predicated on the acceptance of the subcontractors by the Architect and the Owner. A list of the proposed subcontractors is to be provided within 7 days notification of selection for award of this contract.

Bid Guarantee: The undersigned furnishes herewith the bid guarantee in the amount of 5% of the total Base Proposal amount and attaches it to this Proposal. This bid guarantee warrants that the undersigned will not withdraw his proposal for the period of thirty (30) days after the scheduled closing time for the receipt of proposals, and if this proposal is accepted, the undersigned will enter into a formal contract (prepared by the owner) and that the required 100% performance bond and the 100% payment bond will be provided to the Owner. In the event of the withdrawal of this proposal within the period stipulated above, or failure of the undersigned to enter into a contract or provide the required bonds within ten (10) days after the undersigned has received notice of the acceptance of this proposal the undersigned shall be liable to the Owner for the full amount of the bid guarantee.

It is understood that the Owner reserves the right to accept or reject any and all proposals and to waive all informalities. It is further agreed that this Proposal shall be valid for a period of thirty (30) days from the date of opening thereof.

Respectfully submitted,

By _____

Signature _____

Title _____

Business Address _____

Date _____

Seal if proposal is by a corporation

SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Unit-cost allowances.
- C. Related Requirements:
 - 1. Division 1 Section "Unit Prices" for procedures for using unit prices.
 - 2. Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.3 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, markup, general conditions items, bond, and insurance ordered by Owner under the contingency allowance are included in the Contract Sum Base Bid and are not part of the allowance.
- C. At Project closeout, credit unused amounts remaining in the contingency allowance by Change Order.

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes and delivery to Project site.
- B. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

Owner Contingency Allowance: Allow the sum of \$300,000.00 for the Owner's contingency. This amount does not include any applicable taxes which may be required.

2. Electrical Service Allowance: Allow the sum of \$100,000.00 for Excel Energy service installation costs.

END OF SECTION 01210

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation walls and grade beams.
 - 3. Slabs-on-grade.
- B. Related Sections include the following:
 - 1. Division 2 Section "Cement Concrete Pavement" for concrete pavement and walks.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with fly ash; subject to compliance with requirements.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joints: Submit a diagram of proposed construction joints other than those indicated on the Drawings.
- E. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.

1.4 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. **Testing Agency Qualifications:** An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- D. **ACI Publications:** Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- E. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. **Steel Reinforcement:** Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. **Waterstops:** Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. **Products:** Subject to compliance with requirements, provide one of the products specified.
 - 2. **Manufacturers:** Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORM-FACING MATERIALS

- A. **Rough-Formed Finished Concrete:** Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- B. **Chamfer Strips:** Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Wire: ASTM A 82, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. Over vapor barrier use precast concrete block bar supports, to prevent penetration of the membrane.
 - 2. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type as indicated on the drawings. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class C, with carbon content not exceeding 3% by volume.

- B. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.
- C. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.7 WATERSTOPS

- A. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.
 - 1. Products:
 - a. Deneef Construction Chemicals; Swellseal.
 - b. Greenstreak; Hydrotite.
 - c. Mitsubishi International Corporation; Adeka Ultra Seal.
 - d. Progress Unlimited, Inc.; Superstop.

2.8 VAPOR RETARDERS

- A. Plastic Vapor Barrier: Homogeneous polyolefin (woven and recycled plastics not permitted); ASTM E 1745 Class A; Permeance of less than 0.01 Perms [grains/(ft²*hr*in.Hg)] (ASTM F 1249) before and after mandatory conditioning tests (ASTM E 154 sections 8, 11, 12 & 13). Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. Products:
 - a. Epro; Ecoshield-E 15 mil.
 - b. Monarflex; Monarflex Reflex Super.
 - c. Raven Industries Inc.; Vapor Block 15.
 - d. Stego Industries, LLC; Stego Wrap 15 mil Vapor Barrier.

2.9 FLOOR AND SLAB TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.

1. Product: Euclid Chemical Company (The); Euco Diamond Hard.

2.10 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Products:

- a. Axim Concrete Technologies; Cimfilm.
- b. Burke by Edoco; BurkeFilm.
- c. ChemMasters; Spray-Film.
- d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
- e. Dayton Superior Corporation; Sure Film.
- f. Euclid Chemical Company (The); Eucobar.
- g. Kaufman Products, Inc.; Vapor Aid.
- h. Lambert Corporation; Lambco Skin.
- i. L&M Construction Chemicals, Inc.; E-Con.
- j. MBT Protection and Repair, Div. of ChemRex; Confilm.
- k. Meadows, W. R., Inc.; Sealtight Evapre.
- l. Metalcrete Industries; Waterhold.
- m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
- n. Sika Corporation, Inc.; SikaFilm.
- o. Symons Corporation, a Dayton Superior Company; Finishing Aid.
- p. Unitex; Pro-Film.
- q. US Mix Products Company; US Spec Monofilm ER.
- r. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- D. Water: Potable.

- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products:

- a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
- b. Burke by Edoco; Aqua Resin Cure.

- c. ChemMasters; Safe-Cure Clear.
- d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
- e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
- f. Euclid Chemical Company (The); Kurez DR VOX.
- g. Kaufman Products, Inc.; Thinfilm 420.
- h. Lambert Corporation; Aqua Kure-Clear.
- i. L&M Construction Chemicals, Inc.; L&M Cure R.
- j. Meadows, W. R., Inc.; 1100 Clear.
- k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
- l. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
- m. Tamms Industries, Inc.; Horncure WB 30.
- n. Unitex; Hydro Cure 309.
- o. US Mix Products Company; US Spec Maxcure Resin Clear.
- p. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

2.11 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.12 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.13 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 30 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, and concrete with a water-cementitious materials ratio below 0.50.

2.14 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.15 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces.
 - 1. Install keyways, recesses, and the like, for easy removal.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, offsets, keyways, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 1. Lap joints 6 inches and seal with manufacturer's recommended tape.
 2. Carefully cut film around pipes and conduits and then apply tape around these protrusions.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 1. Do not "stab-in" dowels after casting concrete.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset

laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated.
 - 3. Locate joints for grade beams in the middle third of spans.
 - 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated.
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as columns and other locations, as indicated.
 - 1. Terminate full-width joint-filler strips not less than 1 inch or more than 2 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOPS

- A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- E. Concrete on Metal Deck:
1. Before placing concrete on metal deck, clean surfaces to remove all dirt and debris. Use compressed air if necessary.
 2. Deck concrete shall be unloaded from hoppers or buggies uniformly, avoiding concentrations in localized areas, to prevent overstressing deck and to minimize excessive deflections.
 3. Deflection of deck and/or steel will take place when concrete is poured. Construct top surface of slabs within specified tolerances and maintain minimum slab thickness.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B. Foundation Dressing: After form removal, a rubbed slurry coat shall be applied to exterior foundation surfaces which will be exposed above grade. Remove fins and other projections by chipping or grinding. Thoroughly wet concrete surface, then trowel or brush on grout slurry coat consisting of one part gray Portland cement to two parts fine aggregate, mixed with water to required consistency. Wood float the surface to fill all holes and form offsets, and build up to thickness required to produce a smooth, even surface, aligning with wall finishes or setback dimensions. In hot, dry weather, grout shall be kept damp with fog spray or wet blankets during the initial curing period.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
 1. Apply float finish to surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of

trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. Office Area: Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Warehouse: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Reinforce with #3 bars at 8" on center each way, placed midway in fill. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3.13 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 - 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 - 2. Do not apply to concrete that is less than seven days' old.

3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least two month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler as indicated at slab construction joints.

3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that

- penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.
- 3.16 FIELD QUALITY CONTROL
- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - B. Inspections:
 1. Steel reinforcement placement.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 - C. Reinforcing Steel and Embedded Assembly Inspections: Inspect all concrete reinforcing steel prior to placing of concrete for compliance with Contract Documents and approved shop drawings. Observe and report on the following:

1. Number, size, bending, splicing, and length of bars.
 2. Clearance to forms and between bars.
 3. Rust, form oil, and other contamination.
 4. Securing, tying, and chairing of bars.
 5. Installation of anchor bolts and placement of concrete around such bolts.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
 8. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other

requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

END OF SECTION 03300

SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Structural steel.
2. Grout.

B. Related Sections include the following:

1. Division 1 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
2. Division 3 Section "Cast-in-Place Concrete" for embedded metal assemblies.
3. Division 5 Section "Steel Deck" for metal deck field installation of shear connectors.
4. Division 5 Section "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
5. Division 13 Section "Metal Building Systems" for structural steel.

1.2 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

1.3 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction," Part 10.
2. Substitutions: Proposed substitutions of sections or modification of details, and reasons thereof, shall be submitted with shop drawings for review. Submitted substitutions must be clearly identified and noted as such. Approved substitutions, modifications, and necessary changes in related portions of work shall be coordinated by fabricator and shall be accomplished at no additional cost to Owner.
 - a. Substitutions to the beam to column and beam to beam connections shown on the drawings will be reviewed for acceptability if submitted with calculations prepared by a licensed professional engineer.

B. Construction: Type FR, fully restrained.

C. Construction: Type 1, rigid frame.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
- C. Welding certificates.
- D. Qualification Data: For fabricator.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer with not less than 5 years of experience in erection of structural steel.
- B. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category Sbd. An otherwise qualified fabricator is acceptable if satisfactory evidence of qualifications is submitted prior to contract award. For non-certified fabricators, Contractor shall submit a resume describing plant size, equipment, quality control procedures and personnel, and experience on comparable work in the last 3 years.
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 - 1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 - 2. AISC's "Specification for Structural Steel Buildings."
 - 3. AISC's "Specification for the Design of Steel Hollow Structural Sections."
 - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 5. AWS D1.1, "Structural Welding Code."
 - 6. Industrial Fasteners Institute, "Handbook on Bolt, Nut, and Rivet Standards."
 - 7. Steel structure painting council:
 - a. Painting manual, vol. 1, Good Painting Practice.
 - b. Painting manual, vol. 2, Systems Specifications.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
 - 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.7 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
- F. Welding Electrodes: Comply with AWS requirements. Use E70 electrodes.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - 1. Finish: Plain.
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy hex round head steel structural bolts with splined ends; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - 1. Finish: Plain.

- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
- D. Anchor Rods: ASTM F 1554, Grade 36, straight.
 - 1. Nuts: ASTM A 563 hex carbon steel.
 - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 3. Washers: ASTM F 436 hardened carbon steel.
 - 4. Finish: Plain.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer, applied to a dry film thickness of 2.0 mils.
- B. Primer for exterior exposed steel at Checker Canopy: Tnemec "Series 66-1211 Hi-Build Epoxoline" Primer or Carboline "Carboline 858" applied to a dry film thickness of 3 to 5 mils.

2.4 NON-SHRINK GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, Grade B, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time. Compressive strength in 28 days shall be 5000 psi minimum, but in no case less than the specified strength of the base concrete.

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings."
 - 1. Camber structural-steel members where indicated.
 - 2. Mark and match-mark materials for field assembly.
 - 3. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.
- C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.

- F. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches o.c., unless otherwise indicated.
- G. Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: As indicated.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Top surface of beams which support composite metal floor deck.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. Interior exposed or concealed steel: SSPC-SP 3, "Power Tool Cleaning."
 - 2. Exterior exposed steel at Checker Canopy: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of concrete surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings."
- B. Base Plates: Clean concrete bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base plates. Clean bottom surface of base plates.
 - 1. Set base plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of base plate where required.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and base plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1.

- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: As indicated.
- B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
 - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.
 - 1. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:
 - a. Ultrasonic Inspection: ASTM E 164.
 - b. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:
 - 1. Perform bend tests if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
 - 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

- A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories and abutting structural steel.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

END OF SECTION 05120

SECTION 07417 - INSULATED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Foamed-insulation-core metal wall panels.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: 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.
- C. Samples: For each type of metal panel indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Warranties: Samples of special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.7 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. 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. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 72:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
 - 3. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- E. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E 119.
2. Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which wall panel is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies.
3. Radiant Heat Exposure: No ignition when tested according to NFPA 268.
4. Potential Heat: Acceptable level when tested according to NFPA 259.
5. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E 84.

2.2 FOAMED-INSULATION-CORE METAL WALL PANELS

- A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.
1. Panel Performance:
 - a. Flatwise Tensile Strength: 30 psi (207 kPa) when tested according to ASTM C 297/C 297M.
 - b. Humid Aging: Volume increase not greater than 6.0 percent and no delamination or metal corrosion when tested for seven days at 140 deg F (60 deg C) and 100 percent relative humidity according to ASTM D 2126.
 - c. Heat Aging: Volume increase not greater than 2.0 percent and no delamination, surface blistering, or permanent bowing when tested for seven days at 200 deg F (93 deg C) according to ASTM D 2126.
 - d. Cold Aging: Volume decrease not more than 1.0 percent and no delamination, surface blistering, or permanent bowing when tested for seven days at minus 20 deg F (29 deg C) according to ASTM D 2126.
 - e. Fatigue: No evidence of delamination, core cracking, or permanent bowing when tested to a 20-lbf/sq. ft. (958-kPa) positive and negative wind load and with deflection of L/180 for 2 million cycles.
 - f. Autoclave: No delamination when exposed to 2-psi (13.8-kPa) pressure at a temperature of 212 deg F (100 deg C) for 2-1/2 hours.
 2. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.
 - a. Closed-Cell Content: 90 percent when tested according to ASTM D 6226.
 - b. Density: 2.0 to 2.6 lb/cu. ft. (32 to 42 kg/cu. m) when tested according to ASTM D 1622.
 - c. Compressive Strength: Minimum 20 psi (140 kPa) when tested according to ASTM D 1621.
 - d. Shear Strength: 26 psi (179 kPa) when tested according to ASTM C 273/C 273M.

- B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels: Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.
1. Products: Subject to compliance with requirements, provide the following:
 - a. R-profile Insulated Panel.
 2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, **G90 (Z275)** coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, **Class AZ50 (Class AZM150)** coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: **0.022 inch (0.56 mm)**.
 - b. Exterior Finish: Siliconized polyester.
 - 1) Color: As selected by Architect from manufacturer's full range.
 - c. Interior Finish: Siliconized polyester.
 - 1) Color: Imperial White.
 3. Panel Coverage: **40 inches (1016 mm)** nominal.
 4. Panel Thickness: **2.0 inches (51 mm)**.
 5. Thermal-Resistance Value (R-Value): R-7.1 per inch at 75°F according to ASTM C 1363.

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 (Z275 hot-dip galvanized)** coating designation or ASTM A 792/A 792M, **Class AZ50 (Class AZM150)** 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, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch- (25-mm-)** 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. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. 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 type 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; **1/2 inch (13 mm)** wide and **1/8 inch (3 mm)** thick.
 - 2. Joint Sealant: ASTM C 920; 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.

2.5 FINISHES

- A. Panels and Accessories:
 - 1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than **0.2 mil (0.005 mm)** for primer and **0.8 mil (0.02 mm)** for topcoat.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil (0.013 mm)**.

PART 3 - EXECUTION

3.1 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.

3.2 INSULATED METAL WALL PANEL INSTALLATION

- A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.
 - 1. Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.
 - 2. Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
 - 3. Provide metal-backed washers under heads of exposed fasteners on weather side of insulated metal wall panels.
 - 4. 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.
 - 5. Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.
 - 6. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.
 - 7. Apply snap-on battens to exposed-fastener, insulated-core metal wall panel seams to conceal fasteners.
- B. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.
 - 1. Install clips to supports with self-tapping fasteners.
- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. 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. Install work with laps, joints, and seams that are permanently watertight.

3.3 CLEANING

- 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.

END OF SECTION 07417

SECTION 07543 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing system.
2. Roof insulation.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For the following products:
 1. Sheet roofing, of color required.
 2. Walkway pads or rolls, of color required.

1.5 INFORMATIONAL SUBMITTALS

- A. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 15 years from date of Substantial Completion.

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. [Carlisle SynTec Incorporated.](#)
 - 2. [Cooley Engineered Membranes.](#)
 - 3. [Custom Seal Roofing.](#)
 - 4. [Firestone Building Products.](#)
 - 5. [Flex Roofing Systems.](#)
 - 6. [GAF Materials Corporation.](#)
 - 7. [GenFlex Roofing Systems.](#)
 - 8. [Johns Manville.](#)
 - 9. [Mule-Hide Products Co., Inc.](#)
 - 10. [Versico Incorporated.](#)
- B. Source Limitations: Obtain components including roof insulation and fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- C. Solar Reflectance Index: Not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, [Class A] [Class B] [Class C]; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 TPO ROOFING

- A. Fabric-Reinforced TPO Sheet: ASTM D 6878, internally fabric- or scrim-reinforced, uniform, flexible fabric-backed TPO sheet.
 - 1. Thickness: **60 mils (1.5 mm)**, nominal.
 - 2. Exposed Face Color: White.

2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's standard unreinforced TPO sheet flashing, **55 mils (1.4 mm)** thick, minimum, of same color as TPO sheet.
- C. Bonding Adhesive: Manufacturer's standard.
- D. Slip Sheet: Manufacturer's standard, of thickness required for application.
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing to substrate, and acceptable to roofing system manufacturer.
- F. Miscellaneous Accessories: Provide metal termination bars, metal battens, pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.5 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, felt or glass-fiber mat facer on both major surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. [Atlas Roofing Corporation.](#)
 - b. [Carlisle SynTec Incorporated.](#)

- c. [Dyplast Products.](#)
- d. [Firestone Building Products.](#)
- e. [GAF Materials Corporation.](#)
- f. [Hunter Panels.](#)
- g. [Insulfoam LLC; a Carlisle company.](#)
- h. [Johns Manville.](#)
- i. [Rmax, Inc.](#)

- B. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of **1/4 inch per 12 inches (1:48)** unless otherwise indicated.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.6 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- C. Cover Board: ASTM C 728, perlite board, **3/4 inch (19 mm)** thick, factory primed.
- D. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application.

2.7 ASPHALT MATERIALS

- A. Roofing Asphalt: ASTM D 312, Type III or Type IV.
- B. Asphalt Primer: ASTM D 41/D 41M.

2.8 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately **3/16 inch (5 mm)** thick and acceptable to roofing system manufacturer.

PART 3 - EXECUTION

3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.

- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.2 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.
- C. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is **2.7 inches (68 mm)** or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of **6 inches (150 mm)** in each direction.
 - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- D. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
 - 1. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of **6 inches (150 mm)** in each direction. Loosely butt cover boards together and fasten to roof deck.
 - 1. Fasten cover boards to resist uplift pressure at corners, perimeter, and field of roof.
- F. Install slip sheet over cover board and immediately beneath roofing.

3.3 ADHERED ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.
- B. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.

- D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.
- E. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions, to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
 - 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- F. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.4 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings.

3.5 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.6 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07543

SECTION 08410 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Special Conditions, and other Division-1 Specifications Sections apply to this Section.
- B. This Section includes the following:
 - 1. Exterior and interior entrance systems.
 - 2. Fixed windows.

1.2 PERFORMANCE REQUIREMENTS

- A. Provide systems, including anchorage, capable of withstanding loads and thermal and structural movements indicated without failure when supporting full dead loads and without framing members transferring stresses to glazing.
- B. Structural Loads:
 - 1. Wind Load: IBC 2012.
 - 2. Seismic Load: IBC 2012.
- C. Structural Performance: Provide systems, including anchorage, capable of withstanding loads indicated.
 - 1. Deflection Normal to Glazing Plane: Limited to 1/360 of clear span or **3/4 inch (19 mm)**, whichever is smaller.
 - 2. Deflection Parallel to Glazing Plane: When carrying full dead load, not to exceed amount that reduces glazing bite below 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than **1/8 inch (3.2 mm)**.
- D. Structural Testing: ASTM E 330 at 150 percent of inward and outward wind-load design pressures for duration required by design wind velocity without system evidencing material failures, structural distress, deflection failures, or permanent deformation of main framing members exceeding 0.2 percent of clear span.
- E. Air Infiltration: Limited to **0.06 cfm/sq. ft. (0.3 L/s per sq. m)** of system surface area when tested according to ASTM E 283 at a static-air-pressure difference of **1.57 lbf/sq. ft. (75.2 Pa)**.
- F. Water Penetration: No water leakage when tested according to ASTM E 331 at minimum differential pressure of 20 percent of inward acting wind-load design pressure but not less than **6.24 lbf/sq. ft. (299 Pa)**.

- G. Temperature Change (Range): Accommodate 120 deg F (67 deg C) ambient and 180 deg F (100 deg C) material surfaces.
- H. Condensation Resistance Factor (CRF): Not less than 45 per AAMA 1503.1.
- I. Average Thermal Conductance (U-Value): Not more than 0.63 Btu/sq. ft. x h x deg F (3.57 W/sq. m x K) per AAMA 1503.1.

1.3 SUBMITTALS

- A. Product Data: For each system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details of installation and attachments to other Work.
 - 1. Prepare data based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
 - 2. For entrance systems, include hardware schedule and locations.
- C. Samples: For each exposed finish and for each color required.
- D. Sealant test reports.
- E. Product test reports.

1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace systems that fail in materials and workmanship within two years from date of Substantial Completion. Failure includes, but is not limited to the following:
 - 1. Structural failures including, but not limited to, excessive deflection.
 - 2. Adhesive or cohesive sealant failures.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Failure of operating components to function normally.
 - 5. Water leakage through fixed glazing and frame areas.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Basis-of-Design Product at Exterior Location: The design for systems is based on Kawneer TriFab VG 451 T system and the Kawneer 350 Series Doors with Jambs and with continuous factory hinges. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - 1. Butler Manufacturing Company; Vistawall Architectural Products.
 - 2. International Aluminum Corporation; U.S. Aluminum.
 - 3. Kawneer Company, Inc.
 - 4. Tubelite Architectural Systems.
- C. Basis-of-Design Product at Interior Locations: The design for systems is based on Kawneer TriFab VG 450 system and the Kawneer 350 Series Doors with Jambs and with continuous factory hinges. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - 1. Butler Manufacturing Company; Vistawall Architectural Products.
 - 2. International Aluminum Corporation; U.S. Aluminum.
 - 3. Kawneer Company, Inc.
 - 4. Tubelite Architectural Systems.

2.2 MATERIALS

- A. Aluminum: **ASTM B 209 (ASTM B 209M)** sheet; **ASTM B 221 (ASTM B 221M)** extrusions.
- B. Glazing: Specified in Division 8 Section "Glazing."
- C. Glazing Gaskets: Pressure-glazing system of black, resilient glazing gaskets with sealed corners, setting blocks, and shims or spacers.
- D. Gaskets, Sealants, and Joint Fillers:
 - 1. For joints within framing system, as recommended in writing by manufacturer for joint type indicated.
 - 2. For joints at perimeter of systems as specified in Division 7 Section "Joint Sealants."
- E. Bituminous Paint: SSPC-Paint 12, except containing no asbestos, cold-applied asphalt mastic paint formulated for **30-mil (0.8-mm)** thickness per coat.

2.3 COMPONENTS

- A. Doors: **2-inch- (50.8-mm-)** thick glazed doors with minimum **0.188-inch- (4.8-mm-)** thick, extruded tubular rail and stile members, mechanically fastened corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods, and with snap-on extruded-aluminum glazing stops and preformed gaskets.
 - 1. Interior Doors: Provide ANSI/BHMA A156.16 silencers, three on strike jamb of single-door frames and two on head of double-door frames.

- a. Stile Design: Wide, 5-inch maximum width.
2. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.
 - a. Stile Design: Wide, 5-inch maximum width.
 3. Hardware: As specified in Division 8 door hardware Section, doors to be provided with factory approved and supplied continuous hinges.
- B. Fasteners, Flashings, and Accessories: Compatible with adjacent materials, corrosion-resistant, nonstaining, and nonbleeding. Use concealed fasteners except for application of door hardware.
 1. Fasteners and accessories: Nonmagnetic stainless steel to be non-corrosive and compatible with aluminum members, anchors, and other components.
 2. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 3. Finish: Match storefront.

2.4 FABRICATION

- A. Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system.
- B. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
- C. Doors and Door Framing: Reinforce to support imposed loads and for hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components.
- D. Factory assemble framing and components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.5 ALUMINUM FINISHES

- A. Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
 1. Color: Clear Anodized.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Isolate metal surfaces in contact with incompatible metal or corrosive substrates, including wood, by painting contact surfaces with bituminous paint or primer or by applying sealant or tape recommended by manufacturer.
- B. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
- C. Install glazing to comply with requirements of Division 8 Section "Glazing."
- D. Install sealants at system butt joints and perimeter to comply with requirements of Division 7 Section "Joint Sealants."
- E. Install framing components true in alignment with established lines and grades to the following tolerances:
 - 1. Variation from Plane: Limit to **1/8 inch in 12 feet (3 mm in 3.7 m)**; **1/4 inch (6 mm)** over total length.
 - 2. Alignment: For surfaces abutting in line, limit offset to **1/16 inch (1.5 mm)**. For surfaces meeting at corners, limit offset to **1/32 inch (0.8 mm)**.
 - 3. Diagonal Measurements: Limit difference between diagonal measurements to **1/8 inch (3 mm)**.
- F. Install doors without warp or rack. Adjust doors and hardware to provide tight fit at contact points and smooth operation.

3.2 FIELD QUALITY CONTROL

- A. Water Spray Test: After completing installation of each area, test system for water penetration according to AAMA 501.2.
 - 1. Repair or remove and replace Work that fails or is damaged by testing; repair or replace to comply with requirements.

END OF SECTION 08410

SECTION 08920 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Special Conditions, and other Division-1 Specifications Sections apply to this Section.
- B. This Section includes glazed aluminum curtain walls, stick system installation.

1.2 PERFORMANCE REQUIREMENTS

- A. Provide glazed aluminum curtain-wall system capable of withstanding loads and thermal and structural movements indicated without failure when supporting full dead loads, based on testing manufacturer's standard units in assemblies similar to those indicated for Project. Failure includes the following:
 - 1. Supporting-frame deflection exceeding specified limits.
 - 2. Thermal stresses transferred to building structure.
 - 3. Framing transferring stresses to glazing.
 - 4. Noise or vibration created by thermal and structural movement and wind.
 - 5. Loosening or weakening of fasteners, attachments, and other components.
 - 6. Sealant failure.
- B. Structural Loads:
 - 1. Wind Load: IBC 2012.
 - 2. Seismic Load: IBC 2012.
- C. Structural Testing: ASTM E 330 at 150 percent of positive and negative wind-load design pressures for duration required by design wind velocity without assembly evidencing material and deflection failures and permanent deformation of structural members exceeding 0.2 percent of span.
- D. Deflection:
 - 1. Framing Members in Direction Normal to Wall Plane: Maximum 1/360 of clear span or **3/4 inches (19 mm)**, whichever is smaller, unless otherwise indicated.
 - a. Where plaster or gypsum board surfaces are subject to bending, limit deflection to 1/360 of clear span, **3/4 inches (19 mm)** maximum.
 - 2. Deflection of framing members overhanging an anchor point is limited to 2 times the length of cantilevered member, divided by 360.
 - 3. Member deflection does not reduce glazing bite below 75 percent of design dimension when carrying full dead load. Minimum **1/8-inch (3.18-mm)** clearance between members

- and top of fixed panels, glazing, or other fixed part immediately below. Minimum 1/16-inch (1.59-mm) clearance between members and operable windows and doors.
4. System accommodates supporting structure's deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.
 - E. Air Infiltration: Maximum air leakage of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of surface when tested according to ASTM E 283 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa).
 - F. Water Penetration: No water penetration when tested according to ASTM E 331 at a minimum static pressure differential of 20 percent of positive design wind load, but not less than 10 lbf/sq. ft. (479 Pa).
 - G. Temperature Change (Range): Accommodate 120 deg F (67 deg C) ambient; 180 deg F (100 deg C) material surfaces.
 - H. Structural Support Movement: Provide glazed aluminum curtain-wall system that accommodates structural movements including, but not limited to, sway, twist, column shortening, long-term creep, and deflection.
 - I. Condensation Resistance: System CRF of not less than 55 when tested according to AAMA 1503.1.
 - J. Average Thermal Conductance: System average U-value of not more than 0.66 Btu/sq. ft. x h x deg F (3.75 W/sq. m x K) when tested according to AAMA 1503.1.
 - K. Sound Transmission: Average sound transmission loss through system of not less than 34 dB when tested according to ASTM E 90.

1.3 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples: For each exposed finish.
- D. Product test reports.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
 1. Build mockups of four full size window sections.
 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: The design for aluminum glazed curtain-wall system is based on Kawneer 1600 System 1, 7½" Wall System. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 1. Arch Amarlite.
 2. Butler Manufacturing Company; Vistawall Architectural Products.
 3. EFCO Corporation.
 4. International Aluminum Corporation; U.S. Aluminum.
 5. Kawneer Company, Inc.
 6. Reynolds Metals Company.
 7. Tubelite Architectural Systems.

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 1. Sheet and Plate: **ASTM B 209 (ASTM B 209M)**.
 2. Extruded Bars, Rods, Shapes, and Tubes: **ASTM B 221 (ASTM B 221M)**.
 3. Extruded Structural Pipe and Tubes: ASTM B 429.
- B. Steel Reinforcement: ASTM A 36/A 36M for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570/A 570M for hot-rolled sheet and strip.
 1. Protective Coating: Manufacturer's standard corrosion-resistant primer applied immediately after surface preparation and pretreatment.
- C. Glazing:
 1. Glass: Specified in Division 8 Section "Glazing."
 2. Dry Glazing Gaskets: Sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers; in hardness recommended by manufacturer.
 3. Wet Glazing Sealants and Fillers: Specified in Division 8 Section "Glazing."
- D. Framing system gaskets and joint fillers as recommended by manufacturer for joint type.
- E. Sealants and joint fillers for joints within glazed aluminum curtain-wall system as specified in Division 7 Section "Joint Sealants."

- F. Firesafing materials as specified in Division 7 Section "Building Insulation."
- G. Insulating materials as specified in Division 7 Section "Building Insulation."
- H. Bituminous Paint: SSPC-Paint 12, cold-applied asphalt-mastic paint, containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.3 COMPONENTS

- A. Brackets and Reinforcements: High-strength aluminum, with nonstaining, nonferrous shims for aligning system components.
- B. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding and compatible with adjacent materials. Finish exposed portions to match glazed aluminum curtain wall.
 - 1. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.
- C. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
 - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153.
- D. Concealed Flashing: Corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.

2.4 FABRICATION

- A. Fabricate framing components that, when assembled, will do the following:
 - 1. Produce accurately fitted, hairline joints free of burrs and distortion.
 - 2. Drain water passing joints and to drain condensation and moisture occurring or migrating within skylight system to exterior.
 - 3. Isolate glazing thermally and physically from framing members.
- B. Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
- C. Prepare framing to receive anchor and connection devices and fasteners. Reinforce members as required to retain fastener threads.
- D. Welding: Weld in concealed locations to the greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

2.5 ALUMINUM FINISHES

- A. Clear Anodic Finish: Class I, clear anodic coating complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
3. Where aluminum will contact pressure-treated wood, separate dissimilar materials by methods recommended by manufacturer.

B. Fit frame joints to produce hairline joints free of burrs and distortion.

1. Rigidly secure nonmovement joints.
2. Seal joints watertight, unless otherwise indicated.
3. Install members drain water to exterior.

C. Install components plumb and true in alignment with established lines and grades.

D. Install operable windows level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to provide specified performance and proper operation.

E. Anchorage: Fix connections to building structure with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Weld in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

G. Install glazing to comply with requirements in Division 8 Section "Glazing," unless otherwise indicated.

H. Install sealant to comply with requirements in Division 7 Section "Joint Sealants," unless otherwise indicated.

I. Install insulation materials to comply with requirements in Division 7 Section "Building Insulation," unless otherwise indicated.

J. Install firesafing to comply with requirements in Division 7 Section "Building Insulation" unless otherwise indicated.

K. Erection Tolerances:

1. Plumb: **1/8 inch in 10 feet (3 mm in 3 m); 1/4 inch in 40 feet (6 mm in 12 m).**
2. Level: **1/8 inch in 20 feet (3 mm in 6 m); 1/4 inch in 40 feet (6 mm in 12 m).**
3. Alignment: Where surfaces abut in line, limit offset from true alignment to **1/16 inch (1.5 mm)**; where reveal or protruding element separates aligned surfaces by less than **2 inches (50.8 mm)**, limit offset to **1/2 inch (12.7 mm).**

4. Location: Limit variation from plane or location shown Drawings to **1/8 inch in 12 feet (3 mm in 3.7 m); 1/2 inch (12.7 mm)** over total length.

3.2 FIELD QUALITY CONTROL

- A. Water Spray Test: After completing installation of **75-feet- (23-m-)** by-2-story minimum area of glazed aluminum curtain-wall system, test system for water penetration according to AAMA 501.2 in a 2-bay area as directed by Architect.
 1. Repair or remove Work that does not comply with requirements or that is damaged by testing; replace to comply with specified requirements.

END OF SECTION 08920

SECTION 09705 - RESINOUS FLOORING

PART 1 GENERAL

A. SUMMARY

1. This Section includes the following flooring systems:
 - A. A solvent based aliphatic polyurea polyaspartic floor coating.
 - B. A 100% solids copolymer floor coating.
2. Related Sections include the following:
 - a. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections
 - b. Division 3 Section "Cast-in-place Concrete"
 - c. Division 7 Section "Fluid Applied Waterproofing"
 - d. Division 7 Section "Joint Sealers"

B. DEFINITIONS

1. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer/Architect or Construction Manager.
2. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
3. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
4. Installer/Applicator/Erector: Entity engaged by Construction Manager as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

C. PERFORMANCE REQUIREMENTS

1. Chemical Resistance
 - a. Resinous flooring shall withstand repeated exposure to chemical agents used by the Owner in their facilities as specified in construction documents.

- b. Request from the Owner detailed information for these agents including concentration utilized and frequency of application for each.
- c. Certify in writing to the Owner and Engineer/Architect that resinous flooring systems can resist repeated exposure to these agents.

D. SUBMITTALS

1. **Product Data:** For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
2. **Shop Drawings**
 - a. Provide floor plans, of scale matching Architectural Plans, which indicate extent of each different resinous flooring system including system type, color and pattern, degree of slip resistance, and dimensioned locations of control joints and seams where systems meet.
 - b. Provide enlarged details, at minimum 3 inch = 1 foot scale, indicating conditions at walls, door frames, pits, curbs, equipment pedestals, etc.
3. **Samples for Initial Selection:** For each type of exposed finish required.
4. **Samples for Verification:** For each resinous flooring system required, **6 inches** square, applied to a rigid backing by Installer for this Project.
 - a. Include separate samples, matching size noted above, indicating manufacturer's full range of slip resistance options.
5. **Product Schedule:** Use resinous flooring designations and room designations indicated on Drawings in product schedule.
6. **Installer Certificates:** Signed by manufacturer certifying that installers comply with specified requirements.
7. **Maintenance Data:** For resinous flooring to include in maintenance manuals.
8. **Job Site File:** Installer to organize and maintain the following in the construction office at the job site for turnover to the Owner at Substantial Completion:
 - a. Installation instructions
 - b. Preinstallation conference records
 - c. Work log
 - d. Environmental data log, including temperature and relative humidity beginning not less than 1 month before installation.
 - e. System component Material Safety Data Sheets (MSDS).
 - f. Test records from Owner's Testing Agency

E. QUALITY ASSURANCE

1. **Installer Qualifications:** Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
2. **Source Limitations:** Obtain all resinous flooring materials, including grouts, resins, hardening agents, grouting coats, aggregates, topcoats, patching and fill material, joint sealant, and repair materials from a single Manufacturer.
3. **Preinstallation Conference:** Prior to installation of flooring, meet at the Project site with the Manufacturer's Representative, the Installer, the Engineer/Architect, the Owner's Representative and the Owner's Testing Agency. Record discussions and furnish copy to each participant.
4. **Mandatory Testing:**
 - a. **ASTM E 1907 Standard Guide to Methods of Evaluating Moisture Conditions of Concrete Floors to Receive Resilient Floor Coverings**
 - 1) **ASTM F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride Indicating Moisture in Concrete by the Plastic Sheet Method**
 - 2) **ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in site Probes**
 - b. **ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.**
 - c. **ASTM D 4501 Standard Test Method for Shear Strength of Adhesive Bonds Between Rigid Substrates by the Block-Shear Method**
5. **Mockups:** Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - a. Apply full-thickness mockups on **48-inch-** square floor area selected by Engineer/Architect.
 - b. Simulate finished lighting conditions for Engineer/Architect's review of mockups.
 - c. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. QUALITY CONTROL

1. Owner will engage a qualified testing agency to perform testing services related to resinous flooring.
 - a. If elected, owner will furnish Installer with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - b. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 - c. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Installer, and the Contract Sum will be adjusted by Change Order.
2. Owner's Testing Agency: Cooperate with Engineer/Architect, Construction Manager, and Installer in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - a. Notify Engineer/Architect, Construction Manager, and Installer promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - b. Determine the location from which test samples will be taken and in which in-site tests are conducted.
 - c. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - d. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service.
 - e. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - f. Do not perform any duties of Installer.

G. DELIVERY, STORAGE, AND HANDLING

1. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
2. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

H. PROJECT CONDITIONS

1. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture,

ventilation, and other conditions affecting resinous flooring application including the following:

2. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
 3. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- I. Manufacturer shall furnish a single, written warranty covering 100% of the material and labor costs protecting the client from delamination, disbondment, for a period of one (1) years from date of installation.

PART 2 PRODUCTS

A. RESINOUS FLOORING SYSTEM #1

1. A solvent based aliphatic polyurea polyaspartic floor coating.
 - a. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. ACC 75 Aliphatic Polyaspartic by Advacoat, (1-877-8302628) or approved equal.
2. System Characteristics:
 - a. Color: "Ancient Bronze" at lobby or designated office areas.
 - b. Color: "Classic Silver" at restrooms or designated office areas.
 - c. Clear Topcoat: ACC WB Urethane.

B. RESINOUS FLOORING SYSTEM #2

1. A 100% solids copolymer floor coating.
 - a. Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. Overkote HD by Rustoleum.
2. System Characteristics:
 - a. Color: "Light Gray" at warehouse areas.

C. ACCESSORY MATERIALS

1. Patching and Fill Material: Resinous product of resinous flooring manufacturer.

2. Joint Sealant: Type produced by resinous flooring manufacturer for type of service and joint condition indicated.
 - a. Use sealants that have VOC content in compliance with current Ozone Transport Commission (OTC), state and local regulations.

PART 3 EXECUTION

A. PREPARATION

1. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.
2. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 - a. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
 - b. Verify that concrete substrates are dry. See "Testing of Floor Slabs" below.

B. FIELD QUALITY CONTROL

1. Testing and Monitoring Equipment Calibrations: Owner's Testing Agency shall test and demonstrate to the Engineer/Architect, Installer and Owner's Representative that calibrations on all testing and monitoring equipment are providing accurate readings.
2. Manufacturer's Field Service
 - a. Manufacturer's Technical Service Representative: Manufacturer will send qualified technical representative to the Project site for the following purposes:
 - 1) Coordinate schedule, environmental requirements, and pre-installation work with other trades.
 - 2) Advise Installer's personnel of procedures and precautions for use of flooring materials.
 - 3) Attend moisture testing and all other testing procedures with the Engineer/Architect, the Owner's Representative and the Installer in attendance.
 - 4) Observe field mock-ups with the Engineer/Architect, the Owner's Representative and the Installer in attendance.

- 5) Make periodic site visits and include record of observations by manufacturer's technical representative in the applicators project documentation log.
- 6) Ascertain that each component of flooring system is being installed in accordance with manufacturer's instructions.
- 7) Maintain a log of environmental conditions, work procedures, testing procedures, and protection measures to be included in job site file submittal.

3. Testing of Floor Slabs

- a. Before installation of flooring, it is MANDATORY that Owner's Testing Agency test floor slabs for containment of moisture and moisture vapor emission, pH, and alkalinity levels that would be detrimental to adhesion of resinous flooring materials.
- b. Owner's Testing Agency to complete the following moisture tests as described below and as documented in ASTM E 1907.
 - 1) Testing of floor slabs for containment of moisture and moisture vapor emission shall be by calcium chloride test method in accordance with ASTM F 1869.
 - a) For slabs on grade one test kit shall be placed for every 1000.sq. ft. of concrete slab area
 - b) For elevated slabs one test kit shall be placed for every 5000 sq. ft. of concrete slab area
 - c) Maximum transmission emission level for slabs on grade shall be 5 lbs of water per every 1000 sq ft. of floor slab area in 24 hour period.
 - d) Maximum transmission emission level for elevated slabs shall be 5 lbs. of water per 5000 sq. ft. of floor slab area in 24 hour period.
 - e) Protect against rewetting of concrete after testing.
 - f) Coordinate environmental controls in advance and continuing for duration of flooring installation.
 - 2) Owner's Testing Agency to perform plastic sheet tests per ASTM D 4263.
 - 3) Owner's Testing Agency to perform relative humidity tests using probes per ASTM F 2170.
- c. Owner's Testing Agency to perform pH tests per ASTM F 710.

- d. Owner's Testing Agency to also perform additional moisture tests recommended by manufacturer with Owner's approval.
 - e. Verify that concrete substrates have neutral PH and that resinous flooring will adhere.
4. Testing Agency Activities During Resinous Flooring Application
- a. Core Sampling: At the direction of Owner's Representative and at locations designated by Owner's Representative, Owner's Testing Agency to take 1 core sample per 92.9 sq.ft. resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Installer to repair damage caused by coring and correct deficiencies.
 - b. Material Sampling: Owner's Representative may at any time and any number of times during resinous flooring application require the Owner's Testing Agency to collect material samples for testing for compliance with requirements.
 - 1) Material samples will be taken, identified, sealed, and certified in presence of Installer.
 - 2) Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures in addition to testing procedures listed in manufacturer's product data.
 - c. Adhesion Test: Conduct "pull-off" tests on installed flooring in accordance with ASTM D 4501. Certify to the Engineer/Architect that results conform to the manufacturer's published maximum for adhesive strength before failure.
 - d. If test results show applied materials do not comply with specified requirements, Installer to pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

C. MATERIALS PREPARATION

1. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
2. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
3. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations.

D. APPLICATION

1. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - a. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - b. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - c. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
 - 1) Apply joint sealant to comply with manufacturer's written recommendations.
2. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
3. Apply body coat at manufacturer's recommended spreading rate.

E. CURING, CLEANING AND PROTECTION

1. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of curing process.
2. Remove excess resinous flooring material from surfaces it was not intended for and refinish those surfaces to original appearance as determined by the Engineer/Architect.
3. Protect resinous flooring from damage and wear during construction operation. Where temporary covering is required for this purpose comply with manufacturer's recommendations for protective materials and method of their application. Remove temporary covering just prior to cleaning for final inspection.
4. Clean resinous flooring just prior to final inspection. Use materials and procedures recommended by resinous flooring manufacturer.

END OF SECTION 09705

SECTION 11160 - LOADING DOCK EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Special Conditions, and other Division-1 Specifications Sections apply to this Section.
- B. Provide loading dock equipment.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Manufacturers: Serco Co. and APS Resource as noted, or and Architect pre-approved equal.
- B. Dock Levelers: ANSI MH 14.1, Provide, Kelley aFX 6.5, with remote control station, with two Model No. VB420-16SF bumpers, and Flex Frame Shelter. See the details as shown on the drawings.

Kelley contact information:

4Front Engineered Solutions, Inc.
1612 Hutton Drive, Suite 140
Carrollton, Texas 75006
Attn: David Day
Phone: (972)323-6739

- C. Dock Vehicle Restraints: ANSI MH 14.1, Provide GMR Safety, Inc. Powerchock System 5, with control station, with all mounting plates and hardware recommended by the manufacturer. See the details as shown on the drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations. Coordinate installation and construction of related work to ensure proper fit and function of units. Provide templates for work to be built-in by other trades. Inspect, test, and adjust operation to provide safe and efficient use. Restore damaged surfaces.

END OF SECTION 11160

**Coca Cola Refreshments
Amarillo Centerport**

**ADDENDUM NO. 2
February 11, 2014**

The following changes shall be made to the subject plans:

Information in the plans shall be changed to reflect the following addendum 2 attachments, and included into the original plan set as follows:

C2.01 – Site Layout

C3.01 – Site Grading Master

C4.01 – Site Utility Plan

C4.02 – Site Utility Plan – Alternate Bid

C8.01 – Site Grading Inset 3

A written SWPPP has been completed. Architect will provide means of obtaining it.

Existing earthwork stockpiles on AEDC property in the area are available for use.. This material does not meet any select fill requirements. It is contractor's responsibility to take the necessary measures to attain compliance with any and all earthwork fill specs applicable to the job.

The attached specification 1.3.4. shall take the place of the current 1.3.4. The sch 40 waterline shall be governed by the new specification.



OJD ENGINEERING, INC

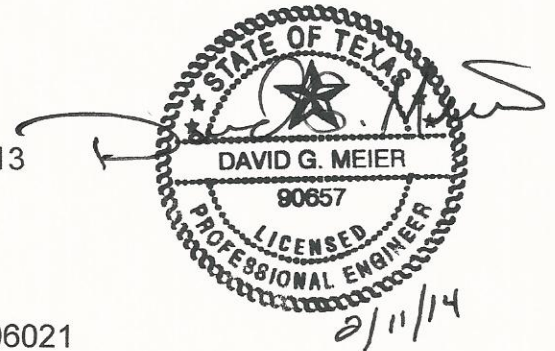
1.3.4. PVC Pressure Pipe: Schedule 40

Schedule 40 pressure pipe shall be Iron Pipe Size (IPS sizes 1/8" through 24"), shall be manufactured from materials per ASTM D1784, and be approved under NSF Standard 61. The following are ASTM D1784 material equivalents: Type I, Grade I Polyvinyl Chloride (PVC) compound, Cell Classification of 12454, and PCV 1120. All PVC Schedule 40 pipe must also meet the requirements of NSF Standard 14 for rigid PVC pipe for pressure applications. The pipe shall be manufactured in strict compliance with ASTM D1785 when Schedule 40 dimensions are specified, and consistently meet the applicable quality-assurance test requirements of ASTM D1785 with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall carry the National Sanitation Foundation (NSF) seal of approval for potable water applications.

Addendum No. 2, February 11, 2014

RE: A New Amarillo Distribution Center for
Coca-Cola Refreshments
8701 Centerport Blvd., Amarillo Texas
Lavin Architects Inc, Job Number 2013-13

FROM: Summit Consultants, Inc.
1300 Summit Ave., Ste 500
Fort Worth Texas 76063
Summit Consultants, Project Number P06021



This revision forms a part of the Contract Documents and modifies the original Construction Documents.

This Addendum consists of one page.

CHANGES TO DRAWINGS:

1. Drawing M1.01, Mechanical Legends, Notes Schedules
Replace contract document with the attached M1.01. Revisions to Notes By Symbols.
2. Drawing M2.01, Building First Floor Mechanical Plan
Replace contract document with the attached M2.01. Revisions to Gas Unit Heater notes.
3. Drawing E1.01, Electrical Legends, Notes Schedules
Replace contract document with the attached E1.01. Revisions to Light Fixture Schedule.
4. Drawing E2.01, Building First Floor Lighting Plan
Replace contract document with the attached E2.01. Revisions to General Notes.
5. Drawing E2.02, Partial Lighting Plans
Replace contract document with the attached E2.02. Revisions to General Notes.

6. Drawing E3.01, Lighting Control Plans
Replace contract document with the attached E3.01. Revisions to General Notes.
7. Drawing E4.02, Enlarged First Floor Power Plan – Area A
Replace contract document with the attached E4.02. Revisions to General Notes, Notes by Symbols and plan notes.
8. Drawing E4.03, Enlarged First Floor Power Plan – Area B
Replace contract document with the attached E4.03. Revisions to Plan notes.
9. Drawing E6.01, Electrical Riser Diagram
Replace contract document with the attached E6.01. Revisions to Electrical Riser Diagram.
10. Drawing P2.01, Building First Floor Plumbing Plan
Replace contract document with the attached P2.01. Modify natural gas pipe notes; add additional louver drainage piping; shift location of Fleet Service trench drain.
11. Drawing P3.00, Partial Plumbing Plans
Replace contract document with the attached P3.00. Shift location of Fleet Service trench drain; Add floor drain in E.S. Training 206.
12. Drawing P3.01, Partial Plumbing Plans
Replace contract document with the attached P3.01. Modify natural gas pipe notes; shift location of Fleet Service trench drain; Add floor drain in E.S. Training 206.

END OF ADDENUM No. 2



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Planning | Landscape Architecture | Site Design

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ADDENDUM

No. 2

Date: February 11, 2014

Project: Coca-Cola Refreshments

Job No. 2013-13

NOTICE TO CONTRACTOR:

- A. This addendum shall be considered part of the Contract Documents for the above mentioned project as though it had been issued at the same time and incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents, this Addendum shall govern and take precedence.
- B. Contractor is hereby notified that they shall make any necessary adjustment in their estimates on account of this Addendum. It will be construed with full knowledge of all modifications and supplemental data specified herein.

Addendum to the Construction Documents. The following changes, additions, and deletions shall be made to the following documents; all other conditions shall remain the same.

Addendum to the Drawings and Specifications:

1. **Clarification – Specifications** - See attached sheets.
2. **Clarification – Sheet L-1.3** –Corrected detail names and scales, details 1-4.
3. **Clarification – Sheet L-1.4** –Corrected detail name and scale, detail 1.
4. **Clarification – Sheet L-1.5** –Corrected detail name and scale, detail 1.
5. **Clarification – Sheet L-2.2** –Corrected detail names and scales, details 1,3,and 6.
6. **Clarification – Sheet L-2.2** –Added Soil Amendment configuration at foundation, Detail 7.
7. **Clarification – Sheet L-2.2 –Detail 1 Grasspave section:** See Detail 1 / sheet L-2.2 on Addendum #2.
8. **Clarification – Sheet L-2.2 –Detail 2:** Fire lane marking consists of the pre-cast concrete blocks as detailed on detail 3/ sheet L-2.2. Concrete edge markers are not painted red and no “parking” restriction signs are required. See detail 3/Sheet L-2.2 for reflective marker information.
9. **Clarification – 4” concrete landscape edge:** See Sheet L-2.2 –detail 6.
10. **Clarification – Added Prepared top soil specification:** See Sheet L-2.2 –detail 7:



02.11.2014

SECTION 02911 - SOIL PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes planting soils specified by composition of the mixes.
- B. Related Requirements:
 - 1. Section 02230 "Site Clearing" for topsoil stripping and stockpiling.

1.2 DEFINITIONS

- A. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- B. Imported Soil: Soil that is transported to Project site for use.
- C. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- D. 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.
- E. 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.
- F. 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.
- G. 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.
- H. USCC: U.S. Composting Council.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Regional Materials: Imported soil manufactured planting soil and soil amendments 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. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; 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: 1:3 by volume.
 2. Ratio of Loose Peat to Soil: 1:3 by volume.
 3. Ratio of Loose Wood Derivatives Soil: 1:3 by volume.
 4. Weight of Iron Sulfate: As indicated by the soils report
 5. Weight of Agricultural Gypsum: As indicated by the soils report
 6. Weight of Superphosphate: As indicated by the soils report
 7. Weight of Commercial Fertilizer: As indicated by the soils report
 8. Weight of Slow-Release Fertilizer: As indicated by the soils report
- B. Planting-Soil Type: 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.
1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, 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.
 2. Topsoil shall be a natural, fertile, loam to clay loam soil, possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well drained areas and shall not be excessively acid or alkaline or contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall contain a minimum of lumps and stones, stumps, roots, or similar substances 3/8" inch or more in diameter. It shall be collected from sites that are not infected with a growth of, or the reproductive parts of noxious weeds. It shall not be stripped, collected or deposited when wet.
 3. Soil textural composition shall be a balance of the following:
 4. 10% to 30% Clay (particles <.002mm)
 5. 30% to 65% Sand (particles .05 to 2mm)
 6. 30% to 70% Silt (particles .002 to .05mm)
 7. The topsoil shall not have a plasticity index greater than 25.
 8. It is the responsibility of the Contractor to furnish the location where the topsoil is to be obtained to the Landscape Architect in writing as well as a one-gallon sample of such soil. The Landscape Architect shall determine the acceptability of the topsoil.
 9. Unacceptable Properties: Clean soil of 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 imported soil.
 - c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 1 inch in any dimension.
 10. 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: 1:3 by volume.
 2. Ratio of Loose Peat to Soil: 1:3 by volume.

3. Ratio of Loose Wood Derivatives Soil: 1:3 by volume.
4. Weight of Iron Sulfate: As indicated by the soils report
5. Weight of Agricultural Gypsum: As indicated by the soils report
6. Weight of Superphosphate: As indicated by the soils report
7. Weight of Commercial Fertilizer: As indicated by the soils report
8. Weight of Slow-Release Fertilizer: As indicated by the soils report

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.
- 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/or cotton burrs.
As manufactured by Soil Mender Inc., Tulia, Texas
 1. Feedstock: May include animal waste.
 2. Reaction: pH of 5.5 to 8.
 3. Soluble-Salt Concentration: Less than 4 dS/m.
 4. Moisture Content: 35 to 55 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-inch sieve.
- B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.
- C. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
- D. 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.

2.5 FERTILIZERS

- A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.
- C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

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. Excavation: Excavate and remove all building structural fill soil from all area(s) shown to receive planting or turf grass to the dimensions and configuration shown on the detail of the Architectural/Structural building foundation detail or to the edge of the designated concrete mow strip. Excavate to a depth sufficient to provide the angles shown on the "Soil Amendment at Foundation" detail on the Drawings. Backfill with approved, unamended, topsoil to a depth within 8" (inches) of finished grade and add prepared, amended soil mix as delineated in Paragraph 3.4.

3.2 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

- A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. 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 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
- C. Mixing: Spread unamended soil to total depth of equal to the structural fill removed and to within 8" of final grade, but not less than required to meet finish grades after placing final planting soil in Paragraph 3.3 and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.
 1. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding 8 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 blended lift of planting soil to 75 to 80 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place except where a different compaction value is indicated on Drawings. Place approved finished topsoil in lifts with sufficient compaction (80% maximum) to prevent settlement, but loose enough to encourage plant growth.

- 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 as shown on the Civil, Architectural or Landscape Architectural Grading Plan.

3.3 PLACING MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE

- A. General: Apply 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: As per Paragraphs 3.1 and 3.2
- C. Application: As per Paragraphs 3.2
- D. Compaction: Place approved finished topsoil in lifts with sufficient compaction (80% maximum) to prevent settlement, but loose enough to encourage plant growth.
- E. The imported topsoil, prior to any amendment, be screened to remove any organic or inorganic debris;
- F. Elemental Sulfur (S) such as supplied by Soil Mender Inc. be added at the rate of 1 lb per cubic yard of imported topsoil and be thoroughly blended;
- G. Organic compost, such as Soil Mender Cotton Burr Blend, which is composed of 30% cotton burrs, 30% feedstock, and 40% hardwood shavings, be added at the rate of 1 cubic yard of compost to 3 yards of native soil and blended to create a homogeneous soil mix;
- H. After backfilling with the above soil mix to within 8" of the surrounding walks, curbs and edges and after installation of the subsurface drip irrigation system, add 6" of a screened topsoil mix such as produced by J. R. Howell Sand & Gravel Company or Soil Mender Topsoil general purpose topsoil.
- I. 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 PROTECTION

- A. Protection Zone: Identify protection zones according to Section 02231 "Tree Protection and Trimming" for any existing trees shown on the plans to remain, if applicable
- 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.

3.5 FINISH GRADING

- A. Grade planting areas to a smooth, even surface. Roll, rake to remove ridges and fill depressions as required to achieve finish grade.
- B. All grades shall meet the approval of the Landscape Architect and/or Project Civil Engineer prior to planting operations.
- C. Final grading for all landscape surfaces shall be by a Contractor with demonstrated experience in finished grading and shall be accomplished and verified through the use of site leveling equipment. The contractor shall produce the contouring and spot elevations as shown on the landscape grading plan or the civil grading plan. Contractor shall protect the finished grade from any and all damage and repair to finished condition as required.

3.6 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 02911