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**ADDENDUM #3**

Bid Opening December 6, 2023 at 2:00pm

To the drawings and specifications for:

**ALL BID PACKAGES**  
for the  
**Centennial Plaza Event Structure**  
for  
City of Canton

**PROJECT: #c22608**

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**TO ALL BIDDERS OF RECORD:**

This Addendum supplements and amends the original Bid Set of Drawings and Project Manual, dated February 24, 2023, and shall be taken into account in preparing bids and shall become a 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.

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**PROJECT MANUAL AND/OR SPECIFICATION REVISIONS**

- a. Not Applicable

**DRAWING REVISIONS**

- a. Not Applicable

**CONTRACTOR QUESTIONS RECEIVED**

A. Q: Could the City please review the estimate and completion time for the project? Based off lead time for the submittals/material and the few quotes we received already, it appears both the estimate and time of completion appear to be too small.

R: Bid Opening: Dec 6th, Bid Award: Approx. Dec. 8th, Project Completion: Aug 9th.

B. Q: I cannot locate the roofing and sheet metal specifications for the Centennial plaza café event structure in the bidding documents. Please advise. Also is there any information on the deck gauge and finish?

R: The café building specifications can be used as reference only; however, final specifications including gauge will be determined upon final engineering of the structure through the fabrication process.

C. Q: Could someone please provide electrical drawings or details on where the electrical is coming from. R: There is an existing electric handhole along 4<sup>th</sup> street w/ 200 ampere, 208/120 V. Contractor to run an electric line from that existing in-ground structure and to install an electric panel and power supply source in the adjacent plant bed located between the overhead structure and the existing building/overhead canopy. Refer to sheet L200 Site Improvements – Materials, Layout and Grading Plan and sheet S101.

**ATTACHMENTS**

**Specifications**

The attached specifications have been pulled from the already constructed Centennial Plaza Cafe building to be used as a REFERENCE guide for the design and engineering of the proposed Event Structure roof/ceiling.

## **ADDENDUM #3**

**MKSK**

- A. 05 31 00 - Steel Decking c rev.pdf
- B. 05 40 00 - Cold Formed Metal Framing c rev.pdf
- C. 07 96 00 - Extensive Green Roof Assembly c rev.pdf
- D. 09 54 01 - Lineal Wood Ceilings c rev.pdf
- E. 09 54 23 - Lineal Metal Ceilings c rev.pdf

### **Drawings**

- A. Not Applicable

### **Contract Forms:**

Please complete the City of Canton's required contract forms, which are attached, and include them with your submitted bid packet.

1. Employment Practices Report for EEO purposes
2. Vendor Information Form - to be reviewed by the Canton Income Tax Dept.

**END OF ADDENDUM #3**

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**SECTION 05 31 00 - STEEL DECKING**

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**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. This Section includes the following:
  - 1. Roof deck.
- B. Related Sections include the following:
  - 1. Division 03 Section "Cast-in-Place Concrete" for concrete fill.
  - 2. Division 05 Section "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
  - 3. Division 09 painting Sections for repair painting of primed deck.

**1.03 PERFORMANCE REQUIREMENTS**

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire-Resistance Ratings: Indicated by design designations of applicable testing and inspecting agency.
  - 2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

**1.04 ACTION SUBMITTALS**

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, attachments to other construction.
  - 1. Shop drawings shall indicate the date of the structural drawings that were used to prepare the shop drawings.
  - 2. Shop drawing submittals shall consist of three (3) prints of each drawing.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of steel deck, signed by product manufacturer.
- B. Welding certificates.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
  - 1. Power-actuated mechanical fasteners.
- D. Research/Evaluation Reports: Evaluation reports from ICC-ES for each of the following:
  - 1. Steel deck.
  - 2. Power-actuated mechanical fasteners.

- E. Field quality-control test and inspection reports.

#### 1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. FMG Listing: Provide steel roof deck evaluated by FMG and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.
- D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Steel Deck:
    - a. ASC Profiles, Inc.
    - b. Canam Steel Corp.; The Canam Manac Group.
    - c. Consolidated Systems, Inc.
    - d. Epic Metals Corporation.
    - e. New Millennium Building Systems, LLC.
    - f. Nucor Corp.; Vulcraft Division.
    - g. United Steel Deck, Inc.
    - h. Valley Joist; Division of EBSCO Industries, Inc.
    - i. Verco Manufacturing Co.
    - j. Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

#### 2.02 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with the latest edition of SDI-RD "Standard for Steel Roof Deck", and with the following:
  - 1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 33 minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
    - a. Color: Gray.
  - 2. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G60 zinc coating.
  - 3. Deck Profile: Type WR, wide rib as indicated on the drawings.
  - 4. Profile Depth: As indicated on the drawings.
  - 5. Design Uncoated-Steel Thickness: As indicated on the drawings.
  - 6. Span Condition: Triple span or more.

7. Side Laps: Overlapped or interlocking seam at Contractor's option.

### 2.03 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile as required to comply with SDI-C and SDI-NC for overhang and slab depth.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter.
- I. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch-wide flanges and level recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.
- J. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- K. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.
- L. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

### 3.02 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI-RD, SDI-C, or SDI-NC, manufacturer's written instructions, and requirements in this Section.
- B. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
- C. Do not use deck units for storage or working platforms until permanently secured.

- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Fastening Deck:
  - 1. Fasten deck units to steel supporting members by welding as noted on drawings.
  - 2. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work. Use welding washers where indicated on drawings.
  - 3. Mechanically fasten side laps of adjacent deck units as noted on drawings.
- G. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- H. Provide additional reinforcement and closure pieces at openings as required for strength and continuity of deck.
- I. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- J. Mechanical fasteners may be used in lieu of welding to fasten deck, subject to prior approval by engineer. Mechanical fastener design values shall equal or exceed the specified weld values.
  - 1. Design Requirements: ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness.
  - 2. Installers shall be trained and certified by manufacturer.

### 3.03 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
  - 1. Weld Diameter: As indicated on the drawings.
  - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated on the drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, as indicated on the drawings:
  - 1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
  - 1. End Joints: Lapped 2 inches minimum.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.
  - 1. Install reinforcing channels or zees in ribs to span between supports and weld.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Mechanically fasten to substrate to provide a complete deck installation.
  - 1. Mechanically fasten cover plates at changes in direction of roof-deck panels, unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

- G. No light gage framing, mechanical, electrical, or other equipment shall be suspended from or attached to any metal roof deck.

### 3.04 FLOOR-DECK INSTALLATION

- A. Floor-Deck Closures: Weld steel sheet column closures and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.
- B. Ceilings, ductwork and lights may be hung from the composite floor deck after concrete has reached 75% of its design strength. Contractor shall list allowable hanger tab capacity on shop drawings. Hung loads shall not exceed tab capacity.

### 3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Required special inspection and verification as outlined in the applicable building code, including but not limited to:
  - 1. Material verification of weld filler material.
  - 2. Inspection of welding.
  - 3. Inspection of mechanical fastening.
- C. Field welds will be subject to inspection, conforming to AWS D1.3.
- D. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
- E. Remove and replace work that does not comply with specified requirements.
- F. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 3.06 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
  - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION

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**SECTION 05 40 00 - COLD-FORMED METAL FRAMING**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

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

**1.02 SUMMARY**

- A. This Section includes the following:
1. **[Exterior non-load-bearing wall framing.]**
  2. Interior non-load-bearing wall framing exceeding span limitations of standard, non-structural metal framing.
  3. **[Ceiling joist framing.]**
  4. **[Soffit Framing.]**
- B. Related Sections include the following:
1. **[Division 05 Section "Metal Fabrications" for masonry shelf angles and connections.]**
  2. Division 09 Section "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, with span limitations, and ceiling-suspension assemblies.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer as defined in section 01 40 00 "Quality Requirements", to design cold-formed steel framing.
- B. Structural Performance: The delegated designer shall design a complete system incorporating the minimum member sizes and the details indicated on the drawings. The complete system shall conform to the design intent indicated on the drawings. This system shall include all framing members shown on the structural drawings. The Architect and Engineer shall review any deviation from this design and additional review costs shall be the responsibility of the Contractor. The supplier and delegated designer are responsible to provide and design all connections, bracing, bridging, stiffeners, etc. as well as miscellaneous structural elements not already sized on the contract documents required for a complete system and continuous load path as indicated on the structural drawings. The design shall not impose loading on the structure, which differs from the design intent indicated on the drawings. Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
1. Design Loads: As indicated on the drawings.
  2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Exterior Wall Framing: Horizontal deflection shall not exceed the following for the respective supported finishes:

EIFS	1/240
Brick Veneer	1/600
Brick Veneer Wainscot Less Than 1/3 Story Height of Stud	1/360
Tile	1/720
Thin Brick*	<b>[1/360]</b>
Cultured Stone	1/600
Terra Cotta*	<b>[1/360]</b>
Metal Panel*	<b>[1/240]</b>
Interior Finished Drywall	1/360



Stucco

1/360

High loads on parapets shall not reduce back span deflection.

\*Verify deflection criteria with finish system manufacturer's recommendations. Design with consideration for differential deflection between adjacent members as recommended by manufacturer.

- b. Interior Wall Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of five lbf/sq. ft.
  3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
  4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
    - a. Upward and downward movement of 1inch, unless indicated otherwise on drawings.
  5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Standards: Framing shall comply with AISI S100, AISI S200, and the following:
1. Wall Studs: AISI S211
  2. Headers: AISI S212.

#### 1.04 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing, product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed metal framing indicated to comply with design loads, include shop drawings and structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation, registered in the state where the project is located.

#### 1.05 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of code-compliance certification for studs and tracks.
- C. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
  1. Steel sheet.
  2. Expansion anchors.
  3. Power-actuated anchors.
  4. Mechanical fasteners.
  5. Vertical deflection clips.

6. Horizontal drift deflection clips
  7. Miscellaneous structural clips and accessories.
- D. Evaluation Reports: For nonstandard cold-formed steel framing, post-installed anchors, and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

#### 1.06 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- E. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, the Steel Stud Manufacturers Association, or a similar organization that provides verifiable code compliance program.
- F. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3/D1.3M, "Structural Welding Code--Sheet Steel."
- G. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required in AISI's "Code of Standard Practice".
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
1. AllSteel Products, Inc.
  2. California Expanded Metal Products Company.
  3. Clark Dietrich Building Systems.
  4. Consolidated Fabricators Corp.; Building Products Division.

5. Craco Metals Manufacturing, LLC.
6. Custom Stud, Inc.
7. Formetal Co. Inc. (The).
8. MarinoWare; a division of Ware Industries.
9. Quail Run Building Materials, Inc.
10. SCAFCO Corporation.
11. Steel Construction Systems.
12. Steeler, Inc.
13. United Metal Products, Inc.
14. Telling Industries, LLC.

## 2.02 MATERIALS

- A. Framing Members, General: Comply with ASTM C955.
- B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
  1. Grade: ST33H, ST50H.
  2. Coating:
    - a. G90 or GF90 for wall back up at brick veneer.
    - b. G60, A60, AZ50, or GF30 for all other framing.
- C. Steel Sheet for Connection Clips and Connection Materials: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
  1. Grade: 50, Class 1 or 2.
  2. Coating: G90.

## 2.03 NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  1. Minimum Base-Metal Thickness: As indicated on the drawings (0.0428 inch for wall stud back up at brick veneer).
  2. Minimum Flange Width: 1-5/8 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
  1. Minimum Base-Metal Thickness: Matching steel studs.
  2. Minimum Flange Width: 1-1/4 inches.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
  1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Clark Dietrich Building Systems.
    - b. MarinoWare, a division of Ware Industries.
    - c. SCAFCO Corporation
    - d. The Steel Network, Inc.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure.

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- E. Slotted Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; punched with vertical slots in both legs. Studs should be positively attached to deep-leg track using vertical slots while allowing free vertical movement. Legs designed to support horizontal and lateral loads and transfer them to the primary structure.

#### 2.04 CEILING JOIST FRAMING

- A. Steel Rafters: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: As indicated on the drawings.
  2. Minimum Flange Width: 1-5/8 inches, minimum.

#### 2.05 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: As required by design. Coordinate with finish system manufacturer's recommendations.
  2. Minimum Flange Width: 1-5/8 inches, minimum.

#### 2.06 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A1003, Structural Grade, Type H, G90.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
  2. Bracing, bridging, and solid blocking.
  3. Web stiffeners.
  4. Anchor clips.
  5. End clips.
  6. Foundation clips.
  7. Gusset plates.
  8. Stud kickers, knee braces, and girts.
  9. Joist hangers and end closures.
  10. Hole reinforcing plates.
  11. Backer plates.

#### 2.07 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel headless, hooked bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES Acceptance Criteria as appropriate for the substrate.
- D. Power-Actuated Fasteners: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

## 2.08 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Cement Grout: Portland cement, ASTM C 150/C 150M, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C 1107/C 1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.

## 2.09 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate framing assemblies using jigs or templates.
  - 2. Cut framing members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
  - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
  - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

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**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

**3.03 INSTALLATION, GENERAL**

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to ASTM C1007 and AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
  - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
  - 1. Cut framing members by sawing or shearing; do not torch cut.
  - 2. Fasten cold-formed metal framing members by welding or screw fastening as indicated on the drawings. Wire tying of framing members is not permitted. Welding of studs at brick veneer back up is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.04 NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as indicated.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
1. Install single-leg deflection tracks and anchor to building structure.
  2. Connect vertical deflection clips to studs and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically 48 inches maximum or as indicated on Shop Drawings. Fasten at each stud intersection.
1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
  2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within [12 inches [18 inches] of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
1. Install solid blocking at 96-inch centers or as indicated on Shop Drawings.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

### 3.05 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting conforming to AWS D1.3 requirements.
- C. Required special inspections and verifications as outlined in the applicable building code, including but not limited to:
1. Fabrication and welding of fabricated cold formed metal elements.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Remove and replace work where test results indicate that it does not comply with specified requirements.

- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

**3.06 REPAIRS AND PROTECTION**

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION



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**SECTION 07 96 00 - EXTENSIVE GREEN ROOF ASSEMBLY**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Sections included under Division 0 & Division 1 are included as a part of this Section as though bound herein.
- B. Bidding and Contract Requirements of the Specifications and the Drawings govern the Work of this section. Provide materials, labor, equipment and services necessary to furnish, deliver and install work of this Section as shown on Drawings, as specified or as required by job conditions.
- C. Coordinate work with that of other trades affecting or affected by work of this Section and cooperate to assure the steady progress of the Work.

**1.02 SUMMARY**

- A. Furnish and install all labor, materials, tools, handling equipment, delivery, etc... for a complete installation of the extensive green roof assembly. This includes, but not limited to, the following:
  - 1. Roof substrate protection board
  - 2. Surface conditioners
  - 3. Roofing membrane and associated flashings at green roof areas only
  - 4. Roofing terminations and flashing associated with above
  - 5. Root barrier protection
  - 6. Roof drainage boards
  - 7. Roof edge protection measures
  - 8. Stone ballast
  - 9. Edge restraint
  - 10. System filter fabrics
  - 11. Lightweight engineered growing media
  - 12. Plantings growing medium and vegetation
- B. This Contractor shall review the Section 07 21 00 – Thermal Insulation for the type of roof insulation indicated. During Bidding, Bidding Contractor must notify Architect if roof deck insulation specified does not comply with green roof assembly specifications.

**1.03 RELATED SECTIONS**

- A. Related sections
  - 1. Division 1 – Alternates
  - 2. Division 5 – Metal Decking
  - 3. Section 06 10 00 – Rough Carpentry
  - 4. Section 07 21 00 – Thermal Insulation
  - 5. Section 07 54 23 – Mechanically Attached TPO Roofing System
  - 6. Section 07 62 00 – Sheet Metal Flashing & Trim
  - 7. Section 07 92 00 – Joint Sealants

**1.04 REFERENCES**

- A. American Society for Testing and Materials (ASTM).
- B. Canadian General Standards Board, CGSB-37.50-M89, Standard for Asphalt, Rubberized, Hot Applied, for Roofing and Waterproofing.
- C. Underwriters Laboratories (UL) Class A.

- D. ANSI/SPRI VR-1 2011 "Procedure for Investigating Resistance to Root Penetration on Vegetative Roofs".
- E. International Concrete Repair Institute (ICRI) Concrete Surface Profile (CSP) Scale.

#### 1.05 DEFINITIONS

- A. Green Roof – An area of planting/landscaping, built up on a waterproofed substrate at any level that is separated from the natural ground by a man-made structure.
- B. Extensive Green Roof – Low maintenance landscaping consisting of shallow growing media depths (< 6 inches (152mm)) with plant varieties restricted to primarily mosses, herbs and succulents capable of withstanding harsh growing conditions.
- C. Intensive Green Roof – Landscaping requiring regular maintenance, consisting of deeper growing media depths (> 6 inches (152mm)) with a wider variety of plant species possible including shrubs and small trees.
- D. Lawn Green Roof – Lawn oriented landscaping requiring at-grade lawn oriented maintenance. Can include sodded or seeded turfgrasses or naturalized grasses with growing media depths > 8 inches (203mm).
- E. Garden Roof® – Patented system of drainage, water retention and root barrier components utilized in the construction of green roofs over Hydrotech's MM 6125® roofing membrane.
- F. Steep Slope Green Roof – Defined as a slope exceeding 3:12 pitch.
- G. "C" Factor – The runoff coefficient used in the Rational Method, "C" represents the portion of the storm rainfall that becomes runoff.
- H. Curve Number (CN) – A number that is used with Natural Resource Conservation Service (SCS) methods to convert rainfall depth into runoff volume. The Curve Number takes into account a site's soil type, plant cover, impervious cover, interception and surface storage.

#### 1.06 SUBMITTALS

- A. Certification from an approved independent testing laboratory experienced in testing rubberized asphalt material, that the material meets the CGSB-37.50-M89 standard for rubberized asphalt membranes, including applicable ASTM procedures.
- B. Certification that the roofing membrane has current validation by Underwriters Laboratories, or other approved independent validation service provider, of a minimum 40% recycled content.
- C. Certification that the roof membrane assembly is currently Class A listed with Underwriters Laboratories.
- D. Certification showing full time quality control of production facilities responsible for the manufacture of the rubberized asphalt and that each batch of material is tested to insure conformance with the manufacturers published physical properties.
- E. Certification that the plant manufacturing the rubberized asphalt material has ISO 9001-2015 approval as evidenced by a copy of the official certificate.
- F. Certification showing that all components of the green roof assembly are being supplied and warranted by a single-source manufacturer.
- G. Certification that the extruded polystyrene insulation if used is free from CFC's.
- H. Ballasting requirements for the specified loose laid extruded polystyrene insulation, and as referenced in part 1.09.L., shall be provided to include the following:
  - 1. A written ballast review on membrane manufacturer's letterhead outlining specific roof level ballasting requirements required to satisfy limited wind resistance warranty conditions.
  - 2. Each roof level shall be individually evaluated and prepared during the design and prebid process
  - 3. A final ballast review shall be submitted that reflects the designed conditions at the time of the project bid.
- I. Product data on all components of the green roof assembly shall be provided.

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- J. Stormwater performance of the specific green roof assembly for the project shall be provided and include:
1. Composite Curve Number (CN) shall be ##
  2. Composite C factor shall be ##
  3. Total volume of water stored in the growing media shall be a minimum of ## cubic feet.
  4. Total volume of water stored in the water retention/drainage element shall be ## cubic feet.
  5. Hydrograph of vegetated roof system showing stormwater release delay and stormwater volume reduction.
- K. Evidence indicating that water is available at the roof level to ensure that the vegetation can receive sufficient moisture through proper maintenance of the green roof.
- L. Evidence that a contract is in place to maintain the vegetation to requirements once installed and throughout the warranty period.
- M. Certification from an approved independent testing laboratory that the roofing manufacturer's extensive 4-inch vegetated roof assembly has been tested in accordance with CSA123.25-15 to a minimum wind speed of not less than 110mph without failure of the assembly.

#### 1.07 QUALITY ASSURANCE

- A. The Roofing/Waterproofing Contractor shall demonstrate qualifications to perform the work of this Section by submitting the following documentation:
1. Certification or license by the membrane manufacturer as a locally based, authorized applicator of the product the installer intends to use, for a minimum of five (5) years.
  2. List of at least three (3) projects, satisfactorily completed within the past five (5) years, of similar scope and complexity to this project. Previous experience submittal shall correspond to specific membrane system proposed for use by applicator.
- B. The Green Roof Installing Contractor shall demonstrate qualifications to perform the work of this Section by submitting the following documentation:
1. Certification or license by the green roof assembly supplier as a locally based, authorized applicator of the products the installer intends to use, for a minimum of five (5) years.
  2. List of at least three (3) projects, satisfactorily completed within the past five (5) years, of similar scope and complexity to this project. Previous experience submittal shall correspond to specific membrane system proposed for use by applicator.
- C. The Green Roof Maintenance Contractor shall demonstrate qualifications to perform the work of this Section by submitting the following documentation:
1. List of at least three (3) green roof projects, satisfactorily completed within the past five (5) years, of similar scope and complexity to this project. Previous experience submittal shall correspond to specific membrane system proposed for use by applicator.
- D. Include single-source for all components from the manufacturer.
- E. The rubberized asphalt membrane product shall contain an inert filler and crumb rubber to enable the product to be resistant to acids (fertilizers, building washes and acid rain) and maintain membrane thickness during application respectively.
- F. Membrane Manufacturer shall have available an in-house technical staff to assist the contractor, when necessary, in application of the products and final inspection of the assembly.
- G. Membrane Manufacturer Qualifications: Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
1. Membrane Manufacturer shall show evidence that the specified rubberized asphalt has been manufactured by the same source for thirty five (35) years and successfully installed on a yearly basis for a minimum of thirty five (35) years on projects of similar scope and complexity.

2. Membrane Manufacturer shall not issue warranties for terms longer than they have been manufacturing their hot fluid rubberized asphalt membrane.
- H. Green Roof Supplier shall show evidence that the specified green roof assembly has been developed, marketed, supported and installed for a minimum of fifteen (15) years on projects of similar complexity.
- I. Green roof supplier shall provide data and calculations, specific to the products being submitted, that verify that the green roof assembly specified meets the project criteria for storm water runoff volume and rate control.
  1. Calculations shall be based on actual testing of suppliers green roof components to be used for the project including but not limited to the regionally specific growing media formulation and water retention/drainage materials.
  2. Calculations shall account for vegetated and un-vegetated portions of the roof as well as local climatic conditions including rainfall depth, intensity, duration, and timing.
- J. Green roof supplier shall provide data demonstrating that the composite C-factor and Curve Number parameters for the specified green roof assembly are less than or equal to those factors used in the engineering design and analysis for the projects drainage and storm water systems analysis.
- K. Pre-Construction Conferences. The manufacturer will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the roofing assembly.

#### **1.08 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original unopened containers of packaging clearly labeled with manufacturer's name, brand name, instruction for use, all identifying numbers, and U.L. labels.
- B. Materials shall be stored in a neat, safe manner, not to exceed the allowable structural capacity of the storage area.
- C. Store materials in a clean, dry area protected from water and direct sunlight.
- D. Store all adhesives at temperatures between 60°F (15.5°C) and 80°F (26.6°C). If exposed to lower temperatures, restore materials to 60°F (15.5°C) minimum temperature before using.
- E. Keep roof substrate board dry before, during, and after installation. Outside storage shall be off ground and protected by a breathable waterproof covering. Roof substrate board shall be roofed the same day as installed.
- F. Vegetation shall be handled and stored in accordance with the Hydrotech Extensive Garden Roof Plant Installation and Maintenance Guideline.

#### **1.09 PROJECT CONDITIONS**

- A. Application of the membrane shall not commence nor proceed during inclement weather. All surfaces to receive the membrane shall be free of water, dew, frost, snow and ice.
- B. Application of membrane shall not commence nor proceed when the ambient temperature is below 0°F (-17.7°C).
- C. Preparation and application of membrane shall be conducted in well ventilated areas.
- D. Over its service life, do not expose membrane or accessories to a constant temperature in excess of 180°F (82°C) (i.e., hot pipes and vents or direct steam venting, etc.).
- E. Adhesives contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near an open fire. Do not use in confined areas without adequate ventilation. Consult container or packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.
- F. Do not allow waste products (petroleum, grease, oil, solvents, vegetable or mineral oil, animal fat, etc.) to come in contact with the roof membrane. Any exposure to foreign materials or chemical discharges shall be presented to membrane manufacturer for evaluation to determine any impact on the roof membrane assembly performance.

- G. Ballasting requirements vary depending on height of roof deck, parapet height, and design wind speed based upon location of building. Vegetated green roofs also require proper ballasting and the possible use of wind erosion mats. Ballast design shall be in accordance with green roof system requirements and other applicable codes or wind design guides.
- H. Contractor shall assure that adequate protection is to the membrane and plantings to prevent damage from subsequent trade traffic.

#### 1.10 WARRANTY

- A. Upon completion of the work, the contractor shall supply the owner with a single-source warranty of U.S. origin direct from the manufacturer.
- B. Warranties available from the manufacturer:
  - 1. Material Warranty; excludes labor.
    - a. Duration: 20-year
  - 2. Watertightness Warranty; includes labor and material to maintain watertight condition and replacement of green roof supplied roof substrate board.
    - a. Duration: 20-year
  - 3. Total System Warranties; covers components of the green roof assembly, including membrane, flashing, green roof components, vegetation, pavers and ballast units. Includes removal and replacement of the insulation, green roof components, vegetation, pavers, ballast units and growing media when supplied, installed, and maintained per green roof system requirements, and replacement of green roof supplied roof substrate board.
    - a. Duration of Membrane/Flashing and replacement of green roof supplied roof substrate board from date of installation (watertight condition):
      - 1) 20-year
    - b. Material Integrity of green roof components from date of purchase:
      - 1) 20-year
    - c. Extensive Vegetation: 2-year thrive and coverage from date of installation:
      - 1) Sedum Plugs: minimum 50% coverage end of year 1; 80% coverage end of year 2
      - 2) Sedum carpet and sedum tile: minimum 75% coverage at delivery and end of year 1; 90% coverage end of year 2
      - 3) Perennial Plugs: 2-year thrive from date of installation
        - a) Duration of Pavers and ballast units from date of purchase: (will not crack, split or delaminate due to freeze-thaw)
      - 4) 10-year

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURER

- A. All components shall be obtained as a single-source from the membrane / green roof manufacturer to ensure total system compatibility and integrity. (\* Indicated the Basis of Design)
  - 1. American Hydrotech, Inc.\*
    - 303 East Ohio Street
    - Chicago, Illinois 60611-3318
    - 800-877-6125 or 312-337-4998
    - FAX: 312-661-0731
    - Web Site: [www.hydrotechusa.com](http://www.hydrotechusa.com)

2. Sempergreen  
17416 Germanna Hwy  
Culpepper, VA 22701  
(540) 399-5055  
[www.sempergreen.com](http://www.sempergreen.com)

3. Or Architect approve equal

**2.02 MATERIALS**

**A. Membrane**

1. Membrane shall be a hot, fluid applied, rubberized asphalt membrane meeting the CGSB-37.50-M89 standard and other pertinent physical properties:
  - a. (40% recycled content)

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>REQUIREMENT</u>
Flash point	CGSB-37.50-M89 ASTM D-92	< 500°F* (260°C)
Penetration	CGSB-37.50-M89 ASTM D-5329	@ 77°F (25°C) max. 110 @ 122°F (50°C) max. 200
Flow	CGSB-37.50-M89 ASTM D-5329	@ 140°F (60°C) max. 3.0mm
Toughness	CGSB-37.50-M89	≥ 5.5 Joules
Ratio of Toughness to Peak Load	CGSB-37.50-M89	≥ 0.040
Water Vapor Permeability	CGSB-37.50-M89 ASTM E-96, Procedure E	≤ 1.7 ng/Pa.s.m <sup>2</sup> (0.027 perm)
Water Absorption	CGSB-37.50-M89	Gain in weight 0.35 g max. Loss in weight 0.18 g max.
Low Temperature Flexibility (-25°C)	CGSB-37.50-M89	No delamination, adhesion loss, or cracking
Low Temperature Crack Bridging Capability	CGSB-37.50-M89	No cracking, adhesion loss, or splitting
Heat Stability	CGSB-37.50-M89	No change in viscosity, penetra- tion, flow or low temperature flexibility

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Viscosity	CGSB-37.50-M89	2 - 15 seconds
Water Resistance (5 days/50°C)	CGSB-37.50-M89	No delamination, blistering, emulsification, or deterioration
Softening Point	ASTM D-36	180°F (82°C)
Elongation	ASTM D-5329	1000% minimum
Resiliency	ASTM D-5329	40% minimum
Bond to Concrete 0°F (-18°C)	ASTM D-5329	Pass
Resistance to Acid	ASTM D-896 Procedure 7.1 (N-8)	Pass - 50% Nitric Acid Pass - 50% Sulfuric Acid
Resistance to Hydrostatic Pressure	ASTM D-08.22 Draft 2	100 psi (equals 231 foot of head water)
Resistance to Salt Water (20% Sodium carbonate calcium chloride)	ASTM D-896 similar	No delamination, blistering, emulsification or deterioration
Resistance to Fertilizer (Undiluted 15/5/5, nitrogen/phosphorus/potash)	ASTM D-896 similar	No delamination, blistering, emulsification or deterioration
Resistance to Animal Waste	3-year exposure	No deterioration
Solids Content		100% - no solvents
Recycled Content	UL Validated	40% (post-consumer) (30% REACH compliant)
Shelf Life		10 years (sealed)
Specific Gravity		1.15 + .02

\* Or alternatively not less than 77°F (25°C) above the manufacturer's maximum recommended application temperature

B. Roof Substrate Board

1. Impact resistant, nonstructural, fiber-reinforced, gypsum panels made from 95% recycled content. Securock Gypsum-Fiber Roof Board as marketed by American Hydrotech, Inc.
    - a. Miscellaneous
      - 1) Fasteners and Plates
        - a) Provide size and type in accordance with Factory Mutual and/or applicable codes and to maintain structural integrity. Only 3 inch round metal plates shall be used.
      - 2) Adhesive
        - a) Provide adhesive compatible with roof substrate board and insulation to comply with Factory Mutual and/or applicable codes and to maintain structural integrity.
      - 3) Vapor Barrier
        - a) Provide suitable vapor retarder as required by design professional.
  2. Other approved fire rated type "X" gypsum roof substrate board.
- C. Surface Conditioner
1. Asphaltic surface conditioner for concrete surfaces only
  2. American Hydrotech, Inc., Surface Conditioner
- D. Reinforcing
1. Spunbonded polyester fabric (standard duty) reinforcing sheet.
  2. American Hydrotech, Inc., Flex Flash® F
  3. 60-mil (1.5 mm) thick, uncured neoprene (heavy duty) reinforcing sheet.
  4. American Hydrotech, Inc., Flex Flash® UN
- E. Flashing
1. 60-mil (1.5 mm) thick, uncured neoprene sheet.
  2. American Hydrotech, Inc., Flex Flash® UN
  3. 157-mil (4 mm) thick, torch-grade, modified asphalt, reinforced flashing membrane.
  4. American Hydrotech, Inc., Flex-Flash® MB
  5. Two-component, liquid applied resin membrane flashing system.
    - a. American Hydrotech, Inc., HydroSeal Resin
    - b. poly methyl-methacrylate (PMMA) resin
    - c. American Hydrotech, Inc., HydroSeal Matrix
    - d. acrylic resin with integral chopped polymer fiber reinforcement
    - e. American Hydrotech, Inc., HydroSeal Flashing Accessories
    - f. resin based primers, additives, reinforcing fleece, surfacing topcoats
- F. Adhesives/Sealant
1. Contact adhesive to bond elastomeric flashing together.
  2. American Hydrotech, Inc., Splicing Cement
  3. Contact adhesive to bond elastomeric flashing to an approved substrate.
  4. American Hydrotech, Inc., Bonding Adhesive
  5. Sealant to seal elastomeric flashing seam edge.
  6. American Hydrotech, Inc., Lap Sealant
  7. Tape to bond laps of uncured neoprene flashings
  8. American Hydrotech, Inc., Seam Tape
- G. Separation/Root Barrier Protection Course
1. Combination of a fiberglass reinforced rubberized asphalt protection sheet and polyethylene root barrier.



2. American Hydrotech, Inc., Hydroflex® 30 and Root Stop
  3. Pressure-sensitive polyethylene tape for Rootstop and Rootstop HD
  4. American Hydrotech, Inc. Root Stop Tape
- H. Insulation
1. Refer to Section 07 54 23 – Mechanically Attached TPO Roofing System.
- I. Drainage/Water Retention Component
1. Three-dimensional, molded panels of recycled polyethylene with drainage channels top and bottom sides and water retention reservoirs top side shall meet the following physical properties.
  2. American Hydrotech, Inc., Gardendrain®
    - a. Gardendrain GR30
- J. Filter Fabric
1. Non-woven, polymeric, geotextile fabric.
  2. American Hydrotech, Inc., Systemfilter
- K. Growing Media
1. Custom growing media mix capable of supporting vigorous growth of the specified vegetation, complying with the following specification.
  2. American Hydrotech, Inc., Extensive LiteTop® Growing Media

Property	Extensive LiteTop Growing Media*
<b>Grain Size Distribution (ASTM F1632 Method B)</b>	
clay fraction (<0.002mm)	< 2 %
silt fraction (0.075-0.002mm)	< 8%
passing #200 sieve (0.075mm)	< 10%
passing #60 sieve (0.25mm)	5 – 25 %
passing #18 sieve (1.0mm)	15 – 45 %
passing #10 sieve (2.0mm)	25 – 60%
passing 1/8-inch sieve	30 – 75 %
passing 1/4-inch sieve	45 – 95%
passing 3/8-inch sieve	95 – 100 %
<b>Density (ASTM E2399)</b>	
Initial Media Density	55 lbs – 80 lbs/cf
Maximum Media Density	70 lbs – 90 lbs/cf
<b>Water/Air Management (ASTM E2399)</b>	
saturated water capacity	> 30%
air filled space (porosity)	> 10%
total pore space	> 40%
<b>Water Permeability</b>	
Hydraulic Conductivity	>12 in/hr
<b>pH, Lime, and Salt Content</b>	
pH (saturated paste)	6.0 – 8.0
salts content (water extract)	<2.5 mmhos/cm
<b>Organics (LOI 550°C) (ASTM F1647)</b>	
Organic Matter content	3 – 8 % by volume
<b>Compost Fraction:</b>	

- 1) Meet or exceed USEPA Class A standard, 40 CFR 503.13, Tables 1 & 3 (chemical contaminants) and 40 CFR 503.32(a) (pathogens) and/or be permitted in the state of origin to produce Class A material.
- 2) Meet or exceed US Compost Council STA/TMECC criteria or equal for Class I or II stable, mature product.

\* Values shall be adjusted due to availability of local materials or special project conditions related to plant selection and/or environmental conditions.

L. Erosion Control Materials

1. Erosion Control Mat
2. Biodegradable Erosion Control Matting: Composed of straw and/or coconut fiber stitched together with biodegradable thread forming top and bottom netting.
3. American Hydrotech, Inc., GardMat® LT
4. Long Term Erosion Control Mat: Composed of polypropylene netting
5. American Hydrotech, Inc., GardMat® N
6. Heavy-Duty Anchors
  - a. Plastic anchor disk with connected plastic stem and friction-fit plastic top disk used to fasten GardMat Erosion Control Mat or sedum carpet and tile.
  - b. American Hydrotech, Inc. Disk Anchors
7. Hydromulch
  - a. Wood fiber-based hydromulch with natural-based tackifier for use in securing sedum cuttings on roof. Where hydromulching equipment is available and has access to roof; hydromulch shall be mixed with tackifier and applied as wet slurry to cutting installations.
8. Dry Hydromulch
  - a. Wood fiber or straw-based hydromulch with integrally mixed guar-based tackifier. For use where hydromulching equipment and access is not possible. Dry hydromulch shall be applied in accordance with the Hydrotech Extensive Garden Roof® Plants Installation and Maintenance Guideline.

M. Vegetation/Plantings

1. American Hydrotech, Inc. Garden Roof® Extensive Plants
  - a. Vegetative Carpet
  - b. American Hydrotech, Inc. Garden Roof® Extensive InstaGreen® sedum carpet
2. Plugs, sedum cuttings, sedum carpet and sedum tile shall be planted and maintained in accordance with green roof systems written specifications by an approved installer.
3. For plugs, the typical planting list consists of 4-7 Sedum species and 2-3 herbaceous perennial species. For sedum cuttings, sedum carpet and sedum tile, the planting list consists of a minimum of 4-7 sedum species.

N. Filter Fabric

1. Water permeable polymeric fabric.
2. American Hydrotech, Inc., Stone Filter Fabric

O. Hardscape / Roof Ballast

1. Stone Ballast
  - a. Well screened and washed stone gravel meeting ASTM D-448-80, gradations #2, 4 or 5 as directed by Dow Chemical Company and American Hydrotech, Inc.

P. Miscellaneous

1. Metal Edging
  - a. Extruded aluminum edging perforated to allow water flow as shown on plans and details.
    - 1) American Hydrotech, Inc. GardenEdge® Metal Edge Restraint; size as
    - 2) American Hydrotech, Inc. GardenEdge® Aluminum Leveling Strips: available to accommodate sloped/level roof surfaces.
2. Inspection Chambers
  - a. Aluminum and stainless steel over drain chambers perforated to allow water flow as shown on plans and details.
    - 1) American Hydrotech, Inc. GardenHatch® Inspection Chambers; size as noted on plans and details.
    - 2) Locate inspection chambers at roof drains
3. Additional Ballast
  - a. Checker Block®: as manufactured by Hastings Pavement Co. LLC and as marketed exclusively by American Hydrotech, Inc. meeting the following properties:
  - b. Steel reinforced precast concrete
    - 1) Minimum 98 lbs per unit
    - 2) Nominally 24" x 24" x 4" deep
    - 3) Continuous and connected void spaces created by 16 truncated concrete pyramids joined by lower concrete connectors.
  - c. Stainless steel zip-ties as supplied by American Hydrotech, Inc.
  - d. Disk Anchors as supplied by American Hydrotech, Inc.

### 2.03 RELATED MATERIALS

- A. Metal counterflashing is typically required to provide protection to vulnerable flashing materials from damage due to gardening activities.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. The roofing contractor shall examine all surfaces to receive the roofing assembly to verify it is acceptable and proper for the application of the membrane. Refer to Green Roof Manufacturer's Pre-Installation & Application Guidelines.
- B. The roofing contractor shall not proceed with the installation of the roof membrane assembly until all roof defects have been corrected.

### 3.02 PREPARATION

- A. All surfaces shall be dry, smooth, free of depressions, voids, protrusions, clean and free of unapproved curing compounds, form release agents and other surface contaminants. (Edit to project requirements)
  1. Metal Deck with roof substrate board
  2. Roof substrate board shall be fire rated type "X" board attached to minimum 22 gauge steel decking with adequate structural support.
  3. Minimum 1/2 inch thick substrate board shall be used over insulation.
  4. Flat fill and tapered roof insulation shall be installed in accordance with layout indicated on shop drawings and insulation board manufacturer's minimum requirements.

5. Adequate number and type of fasteners and plates shall be used to comply with roof substrate and insulation board manufacturer's minimum requirements and applicable codes and to maintain structural integrity.
  - a. Minimum of 10 fasteners and plates per full-size roof board shall be used.
  - b. Appropriate roof adhesive shall be used in accordance with adhesive manufacturer requirements to comply with applicable codes and maintain structural integrity.
    - 1) Size and spacing of adhesive beads shall be as required by adhesive manufacturer.
6. Roof substrate boards shall be installed such that all edge and end joints are supported by metal deck ribs and/or appropriate blocking.
7. Roof substrate board end joints of adjacent lengths shall be staggered.
8. Where required, a suitable vapor barrier membrane shall be applied as determined by the project design professional prior to installation of the roof substrate board and/or insulation.
9. Roof substrate board edges and ends shall be butt loosely in typical installations. Long, uninterrupted runs (greater than 200 feet) of roof substrate board may require slight gapping due to higher temperature gain. Gapping shall not exceed 3/16 inch and all such gaps shall be filled flush with the surface of the roof board with an appropriate sealant.
10. Roof substrate board shall be cut to size using a sharp utility knife and straightedge. The surface of the roof substrate board shall be scored with the utility knife and the board bent up sharply towards the score cut. A keyhole-type drywall saw shall be used for penetration cutouts and radii. A low rpm circular saw shall be used for 5/8 inch thick roof board.

**B. Substrate cleaning**

1. Thoroughly sweep the substrate which is to receive the roof membrane.
2. Substrate shall also be blown clean using an air compressor to remove any remaining loose debris.
3. Final check to determine if concrete has been properly cleaned is to apply a test patch of Monolithic Membrane 6125 to the surface and check its adhesion.

**3.03 INSTALLATION**

**A. Surface conditioner application (to concrete substrates only)**

1. Apply the surface conditioner only to concrete using a hand held sprayer evenly at a rate of 300 to 600 SF/gallon (7.4 - 14.7 m<sup>2</sup>/L) depending on surface texture. Surface conditioner shall "tan" the surface, not blacken it.
2. Allow sufficient time for the surface conditioner to thoroughly dry prior to the membrane application.

**B. Membrane preparation**

1. The membrane shall be heated in double jacketed, oil bath or hot air melter with mechanical agitation, specifically designed for the preparation of a rubberized asphalt membrane.
2. Heat membrane until membrane can be drawn-free flowing at a temperature range between 350°F (176°C) and 375°F (190°C).

**C. Detailing/Flashing**

1. All detailing and flashing shall be done in accordance with the manufacturer's standard guideline details.
2. All detailing and flashing shall be completed before installing the membrane over the field of the substrate.

3. Roof substrate board joints shall be pre-detailed with membrane and fabric reinforcing prior to full fabric reinforced membrane application.
4. All liquid-applied, resin flashings shall be applied over properly completed membrane flashing details in accordance with the manufacturer's standard guideline details.

D. Membrane Application

1. Apply the rubberized asphalt membrane at a rate to provide a continuous, monolithic coat of 90 mil minimum (approximately 2.3 mm), into which is fully embedded a layer of the spunbonded polyester fabric reinforcing sheet, followed by another continuous monolithic coat of membrane at an average thickness of 125 mil (approx. 3.2 mm). Total membrane thickness is to be 215 mils average (approx. 5.5 mm), 180 mils minimum.
2. Overlap fabric reinforcing sheet 1-2 inches (25.4 mm - 50.8 mm) with membrane between sheets.
3. Pre-detailing of joints between plywood and roof substrate board decks is required.

**3.04 SEPARATION/PROTECTION COURSE INSTALLATION**

A. Separation/Protection course shall be installed as follows:

1. Embed the Hydroflex 30 separation/protection course into the membrane while it is still hot to insure a good bond. Installation of a separation course is necessary in order to carry out the water test.
  - a. Overlap adjoining sheet edges (dry) a minimum of 2"-3" (50.8 mm - 76.2 mm) to insure complete coverage.

**3.05 MEMBRANE INTEGRITY TEST**

A. The roof area or portions thereof shall be leak tested by means of electronic testing or by ponding water at a minimum depth of 2" (50.8 mm) for a period of 48 hours to check the integrity of the membrane installation.

1. VERIFY that the structure can support the deadload weight of a watertest before testing.
2. If leaks should occur the water shall be drained completely and the membrane installation repaired.

B. In the event of excessive damage to the membrane assembly, electronic beach detection testing shall be required prior to the placement of subsequent overburden.

**3.06 GARDEN ROOF COMPONENTS INSTALLATION**

- A. All garden roof components shall be installed per manufacturer's requirements.
- B. Root Barrier Protection. Root Stop shall be laid over the Hydroflex 30, lapping adjacent sheets 5 feet (1.5 m). A minimum 30 inch overlap is acceptable when Root Stop Tape is used to continuously seal the lap edge. Root Stop shall be turned up all vertical roofed/flushed surfaces, installing additional material as required, to completely protect waterproofing and flashings.
- C. Insulation. Where specified, STYROFOAM® brand insulation shall be installed loose-laid in accordance with manufacturer's recommendations.
- D. Air Layer. When insulation and Moisture Mat are specified an air layer shall be required between the surface of the insulation and the water retention mat. A layer of Hydrodrain AL or 300 shall be installed over the insulation. The 4 inch (100 mm) salvage edge of the geotextile fabric overlaps adjoining sheets and can be held in place with duct tape.
- E. Moisture Mat. Where specified, a layer of Moisture Mat shall be installed over the root barrier (when no insulation is specified) or air layer/ insulation, lapping adjacent rolls a minimum of 4 inches (100 mm). The Moisture Mat shall be turned up all vertical, roofed/flushed surfaces a

minimum of 6 inches (150 mm) beyond the anticipated growing media level. Any excess shall be trimmed down to the level of the growing media.

- F. Drainage/Water Retention Component.
  - 1. Gardendrain GR15 [Gardendrain GR30] [Gardendrain GR50] shall be installed with holes up, over the root barrier protection, water retention mat (if used) or STYROFOAM® insulation (if used). Adjacent panels shall be butt together. Gardendrain shall be cut to fit around penetrations, etc. with a heavy-duty utility knife or small toothed saw.
- G. Filter Fabric
  - 1. A layer of Systemfilter shall be laid over the Gardendrain, lapping adjacent rolls a minimum of 12 inches (300 mm). Enough material shall be left to be drawn up above the anticipated growing media level. Any excess shall be trimmed down to the level of the growing media.

### 3.07 HARDSCAPE/ACCESSORY INSTALLATION

- A. Stone and/or paver ballast shall be installed at all roof perimeters, building walls, penetrations, and access hatches and as required for vegetation free zones, proper wind design, fire breaks, and as walkway/maintenance paths.
  - 1. Ballast design shall be in accordance with Dow Chemical Company and American Hydrotech, Inc. requirements. CONTACT Hydrotech for ballasting recommendations.
- B. Checker Block® shall be installed per Hydrotech requirements and as shown on Hydrotech details.
  - 1. Checker Block® shall be installed where indicated on plans and as required per ballasting requirements established by American Hydrotech, Inc.
  - 2. Disk Anchors shall be installed in Checker Block® and elsewhere in Garden Roof to the pattern required per the ballasting requirements established by American Hydrotech.
  - 3. Stainless steel zip ties as supplied by American Hydrotech shall be used to connect Checker Block® units together as required by American Hydrotech, Inc.
- C. Metal edge restraints, precast curbing and all specified edging materials shall be installed as shown on plans and details.
- D. Drains shall be fitted with inspection/maintenance chambers and grills, built up to ensure access at growing media level as shown on plans and details.

### 3.08 GROWING MEDIA INSTALLATION

- A. LiteTop growing media shall be placed carefully to avoid damage or displacement of other materials such as walls, paving, drainage components, filter fabric, and roofing membrane.
- B. LiteTop growing media shall be placed to within 1 inch greater than final grade or to a depth of no greater than 8 inches and compacted as described below. For final grades less than 8 inches only one round of compaction shall be performed and remaining growing media loosely placed such that top of growing media exceeds final grade by 1 inch. For final grades greater than 8 inches, place growing media at no greater than 6 inches and repeat procedure until growing media has been compacted within 1 inch of final grade.
- C. Compaction shall be performed with a 300 – 400 lb. landscape. Mechanical compactors including plate compactors are not recommended.
- D. Where Checker Block is installed, roller compaction is not possible. Hand compaction shall be employed to properly compact media. Unless deeper media profile is specified, top of media shall be equal to or just higher than top of Checker Block® units.
- E. After compaction remaining growing media shall be placed at 1 inch greater than final grade and thoroughly watered or jetted over entire area. Low settled areas shall be filled with additional growing media and re-wet to achieve uniform prescribed final grade.

- F. Erosion Control Mat.
  - 1. The erosion control mat shall be installed directly over the growing media and properly anchored into place.
    - a. fastening pattern is based on local wind speed, building height and roof slope. Contact Hydrotech for specific guidelines.
    - b. Erosion control mat is not required when Sedum Carpet is installed; however, the Sedum Carpet shall be anchored in place as required.

### 3.09 VEGETATION INSTALLATION

- A. Vegetation planting shall be installed in accordance with the Hydrotech Extensive Garden Roof Plant Installation Guidelines.
- B. Plant materials shall not be installed between the fall frost date and the following spring frost date. Contact Hydrotech for fall and spring frost dates specific to the Project and plant material type.
- C. Growing media shall be thoroughly watered and saturated immediately prior to installing new plant material.
- D. Where Checker Block® is installed, media shall be properly placed before plant material is installed. Where InstaGreen sedum carpet is used, no gaps shall exist between the bottom of the sedum carpet and the media placed in the Checker Block® units.
- E. All vegetation shall be thoroughly watered and saturated immediately after installation. Media is saturated when water is seen flowing into roof drains from adjacent areas.

### 3.10 VEGETATION MAINTENANCE

- A. Contractor/Installer shall maintain plantings in accordance with the Hydrotech Extensive Garden Roof Maintenance Guidelines. Contact Hydrotech for specific maintenance requirements.
- B. Maintenance activities shall include, but are not limited to, the following:
  - 1. Periodic on-roof monitoring of vegetation
  - 2. Watering to maintain proper growing media moisture content (especially during periods of hot and dry weather)
  - 3. Weeding to remove unwanted vegetation from planted areas and vegetation free zones.
  - 4. Removal of debris
  - 5. Reporting and photo-documentation of progress of vegetation during maintenance and warranty period.
- C. Maintenance shall begin immediately after vegetation installation and shall continue through final acceptance and turn-over of the project to the owner.
- D. Maintenance activities shall continue throughout the two-year warranty period (from date of vegetation installation) to keep vegetation warranty in effect.

**END OF SECTION**

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## SECTION 09 54 01 - LINEAR WOOD CEILINGS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Sections included under Division 0 & Division 1 are included as a part of this Section as though bound herein.
- B. Bidding and Contract Requirements of the Specifications and the Drawings govern the Work of this section. Provide materials, labor, equipment and services necessary to furnish, deliver and install work of this Section as shown on Drawings, as specified or as required by job conditions.
- C. Coordinate work with that of other trades affecting or affected by work of this Section and cooperate to assure the steady progress of the Work.

#### 1.02 SUMMARY

- A. Section Includes:
  - 1. Wood veneer ceiling planks.
  - 2. Concealed grid suspension system.
  - 3. Wire hangers, fasteners, main runners, wall angle moldings and accessories.

#### 1.03 RELATED SECTIONS

- A. Related Sections:
  - 1. Section 09 54 23 – Lineal Metal Ceilings
  - 2. Divisions 23 – HVAC
  - 3. Division 26 Sections – Electrical Work

#### 1.04 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - 2. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
  - 3. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
  - 4. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 5. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
  - 6. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 7. ASTM E 1264 Classification for Acoustical Ceiling Products.
- B. CISCA Seismic Zones (0-2) (3-4) Ceilings and Interior Systems Construction Association Guidelines for Seismic Restraint for Direct Hung Suspended Ceiling Assemblies

#### 1.05 SUBMITTALS

- A. In accordance with Division 1 – Submittal Procedures.
- B. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.



- C. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.
- D. Samples: Minimum 3-1/2 inch or 5-1/2 inch samples of specified panel; 8 inch long samples of exposed wall molding and suspension system, including main runner.
- E. Shop Drawings: Layout and details of ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.
- F. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- G. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

#### 1.06 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
  - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
    - a. Flame Spread: 25 or less
    - b. Smoke Developed: 50 or less
  - 2. HPVA (Hardwood Plywood and Veneer Association) certification and audit program per ASTM E-84 tunnel test.
- C. Woodworking Standards: Manufacturer must comply with specified provisions of Architectural Woodworking Institute quality standards.
- D. Linear Wood, as with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern, or possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.
- E. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store ceiling components in a dry interior location in their cartons prior to installation to avoid damage. Store cartons in a flat, horizontal position. The protectors between the panels should not be removed until installation.
- B. Do not store in unconditioned spaces with humidity greater than 55 percent or lower than 25 percent relative humidity and temperatures lower than 50 degrees F or greater than 86 degrees F. Panels must not be exposed to extreme temperatures, for example, close to a heating source or near a window with direct sunlight.
- C. Handle ceiling units carefully to avoid chipped edges or damage to units in any way.

#### 1.08 PROJECT CONDITIONS

- A. Wood veneer ceiling materials should be permitted to reach room temperature and have a stabilized moisture content for a minimum of 72 hours before installation.
- B. The wood veneer panels should not be installed in spaces where the temperature or humidity conditions vary greatly from the temperatures and conditions that will be normal in the occupied space.

- 
- C. As interior finish products, the wood veneer panels are designed for installation in temperature conditions between 50 degrees F and 86 degrees F, in spaces where the building is enclosed and HVAC systems are functioning and will be in continuous operation. Relative humidity should not fall below 25 percent or exceed 55 percent.

#### 1.09 WARRANTY

- A. Wood Veneer Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
1. Ceiling Panels: Defects in materials or factory workmanship.
  2. Grid System: Rusting and manufacturing defects.
- B. Warranty Period:
1. Wood veneer panels: One (1) year from date of installation.
  2. Grid: Ten years from date of installation.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

#### 1.10 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
1. Ceiling Units: Furnish quantity of full-size units equal to 5.0 percent of amount installed.
  2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Ceiling Panels:
1. Armstrong World Industries, Inc. – Basis of Design
  2. Certainteed
  3. Equals approved by the Architect in writing.
- B. Suspension Systems:
1. Armstrong World Industries, Inc. – Basis of Design
  2. Certainteed
  3. Equals approved by the Architect in writing.

#### 2.02 WOOD VENEER CEILING UNITS

- A. Ceiling Panels Type "LW":
1. Basis of Design: WOODWORKS Linear Veneered Planks, 6440W1 NMP, as manufactured by Armstrong World Industries:  
Armstrong Sales Contact: Rob Hager, Sales Rep Phone: 216-513-7210
  2. Veneers: Natural Variations Maple
  3. Size: 96in x 3-3/4in x 3/4in with 3/4in reveal.

4. Edge Banding and Trim: To match face veneer
5. Noise Reduction Coefficient (NRC): ASTM C 423
  - a. Nominal 4-1/2" Module - 0.65 with acoustical backing
6. Flame Spread: ASTM E 1264; Class A.

### 2.03 SUSPENSION SYSTEMS

- A. Components: All linear carriers shall be commercial quality hot dipped galvanized steel as per ASTM A 653. Linear carriers are double-web steel construction with concealed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Linear carriers shall have rotary stitching.
  1. Structural Classification: ASTM C 635, Heavy Duty.
  2. Color: Black, unless noted otherwise.
  3. Clips: Integral, factory-applied, spring steel clips on linear carriers in sufficient number to receive 8 foot linear wood (nominal 4 inch) (nominal 6 inch) planks.
  4. Acceptable Product: HD Linear Carrier as manufactured by Armstrong World Industries, Inc.
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
- D. Accessories/Edge Moldings and Trim:
  1. Linear Splices, Item #5843, for splicing planks together end-to-end

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.
- B. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

### 3.02 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

### 3.03 INSTALLATION

- A. Install suspension system and panels in compliance with ASTM C636; CISCA Seismic Guidelines; approved construction drawings; with the authorities having jurisdiction; and in accordance with the manufacturer's installation instructions, WoodWorks Linear Installation Instructions, LA-297076.
- B. Suspend linear carriers from overhead construction with hanger wires spaced 4 feet on center along the length of the linear carrier. Install hanger wires plumb and straight. Hanger wires shall not be installed in convenience holes. Install linear carriers 24 inches on center (or less).
- C. Install wall moldings at intersection of suspended ceiling and vertical surfaces.
- D. Follow the instructions found in "WoodWorks Linear Installation Instructions", LA-297076, for border treatment of the WoodWorks Linear planks.
- E. Install sound control accessory panels above entire area of Linear Wood Ceiling system.

**3.04 ADJUSTING AND CLEANING**

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION**

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## 09 54 23 - LINEAL METAL CEILINGS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Sections included under Division 0 & Division 1 are included as a part of this Section as though bound herein.
- B. Bidding and Contract Requirements of the Specifications and the Drawings govern the Work of this section. Provide materials, labor, equipment and services necessary to furnish, deliver and install work of this Section as shown on Drawings, as specified or as required by job conditions.
- C. Coordinate work with that of other trades affecting or affected by work of this Section and cooperate to assure the steady progress of the Work.

#### 1.02 SUMMARY

- A. This Section includes linear metal pans and specially engineered suspension systems. Interior or (protected horizontal) exterior linear metal ceiling system (fire-rated) (non-fire-rated) assemblies, consisting of pre-finished aluminum or steel pans mounted to a carrier system and incorporating lighting fixtures and air handling components as applicable to the particular project design.
- B. Linear metal ceiling are to match in dimension, finish, installation, etc. the linear wood ceiling system installed at interior locations.

#### 1.03 RELATED SECTIONS

- A. Related Sections include the following:
  - 1. Division 5 – Light Gauge Metal Framing
  - 2. Section 09 54 01 – Linear Wood Ceilings
  - 3. Division 26 – Electrical

#### 1.04 REFERENCES

- A. ASTM C635 or C636: Manufacturing and Installation of Suspended Ceilings.
- B. Underwriters Laboratories Inc.: Fire Resistance Directory, Design Nos. D218, P230, and P267.
- C. ASTM E119: Fire Tests of Building Construction and Materials.
- D. ASTM C423: Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

#### 1.05 SUBMITTALS

- A. In accordance with Division 1 – Submittal Procedures
- B. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.
- C. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part 3, Installation.
- D. Samples: Minimum 3-1/2 inch or 5-1/2 inch samples of specified panel; 8 inch long samples of exposed wall molding and suspension system, including main runner
- E. Samples: Submit representative sample of color and finish of all exposed materials.
- F. Shop drawings:
  - 1. Reflected ceiling plans: Contractor shall indicate layout arrangement of ceiling design, dimensions and locations of related integrated lighting and air distribution components.
  - 2. Contractor shall provide a layout drawing locating the light gauge metal framing member attached to the metal roof decking.

3. Contractor shall coordinate installation and support of recessed light fixtures and furnish and install all necessary accessories, items, components required for complete installation.
  4. Installation drawings: Detail complete installation including carrier system, connections between carriers and pans, details of level changes and/or changes in pattern, installation of related lighting and air distribution components, access requirements, sound absorption requirements, and fire rating requirements when applicable.
- G. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- H. Manufacturer's data: Submit manufacturer's catalog cuts or standard drawings showing details of system with project conditions clearly identified and manufacturer's recommended installation instructions, including independent lab report on wind testing.
- I. Maintenance materials: Submit one percent of amount of linear metal ceiling components installed.
- J. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery of materials: Deliver materials in original unopened packages, clearly labeled with manufacturer's name, item description, specification number, type, and class as applicable.
- B. Inspection: Promptly inspect delivered materials, file freight claims for damage during shipment, and order replacement materials as required. Any damaged materials shall be promptly removed from the job site.
- C. Storage: Store in manner that will prevent warpage, water damage, or damage of any kind. Prevent interference to/by other trades and any other adverse job conditions due to storage locations or methods.
- D. Handling: Handle in such a manner as to ensure against racking, distortion, or physical damage of any kind.

#### **1.07 QUALITY ASSURANCE**

- A. Subcontractor qualifications: Installer shall have not less than three years of successful experience in the installation of linear metal ceiling systems on projects with requirements similar to requirements specified.
- B. Requirements of regulatory agencies: Codes and regulations of authorities having jurisdiction.
- C. Source quality control.
1. Test reports: Manufacturer will provide test certification for minimum requirements as tested in accordance with applicable industry standards and/or to meet performance standards specified by various agencies.
  2. Changes from system: System performance following any substitution of materials or change in assembly design must be certified by the manufacturer.
- D. Delete below if work of this Section is not extensive or complex enough to justify a preinstallation conference. If retaining, coordinate with Division 1 Section "Project Meetings."

#### **1.08 PROJECT CONDITIONS**

- A. Existing conditions: (Include specific alteration work requirements for project.)
- B. Environmental requirements: Building shall be enclosed with windows and exterior doors in place and glazed, and roof water-tight before installation of linear metal ceiling system and related ceiling components. Climatic condition range of 60 °F (16 °C) to 85 °F (29 °C) and relative humidity of not more than 70%.
- C. Coordination with other work:

1. Mechanical work: Ductwork above ceiling shall be complete and permanent heating and cooling systems operating to climate conditions prior to installation of linear metal ceiling components.
  2. Electrical work: Installation of conduit above ceiling shall be complete before installation of linear metal ceiling components.
  3. Fire protection work: Fire protection lines and/or equipment occurring above ceiling shall be completed and tested before linear metal ceiling components are installed.
- D. Protection: Protect completed work above ceiling system from damage during installation of linear metal ceiling components.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Ceiling Panels:
1. Basis of Design: Armstrong World Industries, Inc.
  2. Certainteed
  3. Or equal approved by the Architect in writing

### **2.02 LINEAR METAL ASSEMBLY**

- A. Ceiling Panels Type "LM":
1. Basis of Design: METALWORKS Linear Exterior, 5490 FXMP, as manufactured by Armstrong World Industries  
Armstrong Sales Contact: Rob Hager,  
Sales Rep Phone: 216-513-7210
  2. Color: Effects Maple, Carrier molding to be black
  3. Planks: 4" Unperforated
  4. Size: 96" x 4" x 5/8"
  5. Fire Rating: Class A
- B. Support system:
1. Special Installation Note! – Installation for this project will involve furnishing and installing the ceiling panel clips directly to the light gauge metal framing as indicated on the drawing details. Installer to furnish and install all required anchoring clips to attach carriers to metal framing.
    - a. Installer shall provide direction as to location of the supporting light gauge framing. Refer to Submittals.
    - b. Installer shall coordinate support of light fixtures.
- C. Accessories: Furnish and install all accessories as required for complete exterior installation. Including but not limited to:
1. Carrier Molding
  2. Pressure Springs
  3. Panel Splices
  4. Filler Strips
  5. Pan retainer clip
  6. Seismic clip
  7. Mechanical fasteners: Material and finish to match item to which installed; type and size as required for particular installation.
  8. Rigid attachment clips.

## 2.03 FABRICATION

- A. Pans: Edges formed to snap onto carrier members and provide positive locking mechanism with no additional fasteners; factory-finished to match approved samples.
- B. Support system: Formed and fabricated for mechanical connection with adjoining section and pre-punched holes for [direct suspension] or [mechanically fastened in place].

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. For exterior ceiling applications only, Examine areas to receive linear metal ceiling system for conditions that will adversely affect installation.
- B. Do not start work until unsatisfactory conditions are corrected.
- C. Work to be concealed: Verify work above ceiling suspension system is complete, tested, and installed in manner that will not affect layout and installation of linear metal ceiling system.
- D. Exterior\* wind bracing to be approved by a registered professional engineer licensed by the state where the product is being installed.
- E. \*Exterior refers to horizontal applications such as soffits and drive-throughs—not intended for fascias or facade use.

### 3.02 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.
- B. Coordination: Coordinate and schedule installation of linear metal ceiling system with work of other trades affected by this installation, with particular attention given to electrical work required to be installed and operating before ceiling work can begin.

### 3.03 INSTALLATION

- A. Reference: Install in accordance with approved shop drawings and manufacturer's instructions. Follow architects' details for thermal and building expansion joint treatments.
- B. Carrier system:
  - 1. Adjustment: Align support system straight, level, and in required position
  - 2. Mechanical fasteners: Where required, install in manner that will provide completed assembly to conform to project design requirements.
- C. Pans:
  - 1. General: Snap metal pans into position; splice end-to-end with integral splice.
  - 2. End plugs: When pan ends are visible, install end plugs flush with end surface.
- D. Lighting components: Refer to Electrical Drawings and Specifications.
- E. Exterior installation: Install hanger reinforcements, compression posts and other structural components as required per structural engineer's evaluation

### 3.04 CLEANING

- A. PARALINE pans: Clean painted pans with nonabrasive, non-solvent-based commercial cleaner. Clean polished finishes with nonabrasive, quick-drying glass cleaner. A soft cotton cloth is recommended.
- B. Immediately remove any corrosive substances or chemicals that would attack painted finish.
- C. Touch up all minor scratches and spots, as acceptable, or replace damaged sections when touch-up is not permitted.
- D. Removal of debris: Remove all debris resulting from work of this section.



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**END OF SECTION**

**Bidder and Contractor Employment Practices Report**  
City of Canton Office of Compliance

**I. INSTRUCTIONS**

- A. This form is designed to provide an evaluation of your policies and practices as they relate to the extension of equal employment opportunity to all persons regardless to race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity.
  
- B. City of Canton Codified Ordinance 507 and rules and regulations pursuant thereto provide for a contract compliance inspection of personnel policies and practices related to any contract with the City including contracts for work, labor, services, supplies, equipment, materials, leases, concession agreements, and permits.
  
- C. Completion of this Contractor and Bidder Employment Practices Report is one of the steps which demonstrate compliance with the City’s Equal Employment Opportunity Program. Responsibility for demonstrating compliance with the Program by the vendor and its subcontractors rests with the vendor or subcontractor. Such demonstration is a prerequisite for continued eligibility for the award City contracts.

**II. VENDOR OR BIDDER INFORMATION**

1. Reporting Status  A. Prime Contractor      B. Prime Subcontractor      C. Supplier      D. Other (Specify)
2. Name, Address and Telephone Number of Bidder Covered by This Report   
3. Name, Address and Telephone Number of Principal Official or Manager of Bidder   
4. Name, Address and Telephone Number of Principal Office of Bidder   

Evaluation (Office Use Only)

- Compliant
  
- Non-Compliant
  
- Follow up needed \_\_\_\_\_

**III. POLICIES AND PRACTICES**

The bidder and the Contractor will indicate his willingness or unwillingness to comply with the requirements of the Equal Employment Opportunity Program of the City of Canton by encircling the applicable letter associated with each item below. The letters are interpreted as follows:

**A** – Current Practice    **B** – Company will immediately adopt this policy    **C** – Company is unwilling or is unable to adopt policy.

Circle One	Items	State Reason if (C) is checked
A    B    C	1. The company will adopt a policy of non-discrimination on the basis of race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity, with regard to recruitment, hiring, training, upgrading, promotion and discipline of employees or applicants for employment. This policy will be communicated in writing to all employees, subcontractors, recruitment sources and all relevant labor organizations and unions.	
A    B    C	2. The Company will develop procedures which will assure that this policy is understood and carried out by managerial, administrative, supervisory personnel.	
A    B    C	3. The company will use recruitment sources such as employment agencies, unions, and schools which have a policy of referring applicants on a non-discriminatory basis.	
A    B    C	4. The company will participate in training programs for the benefit of employees or prospective employees, according to the intent of City Codified Ordinance 507.	
A    B    C	5. Company recruiters will seek a broad recruitment base in order that a representative cross-section of applications might be obtained, and will refrain from a hiring policy which limits job applicants to persons recommended by company personnel.	
A    B    C	6. Company will take steps to integrate any position, departments, or plant locations which have no minority persons, or are almost completely staffed with one particular ethnic or racial group.	
A    B    C	7. The Company will review its qualifications for each job to determine whether such standards eliminate unemployed persons who could, if hired, perform the duties of the job adequately. The following qualifications should be reviewed: Education, Experience, Tests, and Criminal Records.	
A    B    C	8. Residence in a particular geographical area will not be a qualifying or disqualifying criterion for employment with the Company.	
A    B    C	9. The Company will provide that all bargaining agreements with employee organizations, including labor unions, have non-discrimination clauses requiring equal employment opportunity.	

**IV. EMPLOYMENT DATA**

Please note that this data may be obtained by visual survey or post-employment records. Neither visual surveys nor post-employment records are prohibited by any Federal, State or local law. All specified data are required to be filled in by law. Please provide truthful and accurate information. If information provided is found to be false, bidder/contractor will be subject to the loss of all future awards.

**MALE:**

**FEMALE:**

Categories	Overall Total	Total Male	Total Female	African American	Asian American	Native American	Hispanic	African American	Asian American	Native American	Hispanic
Officials, Managers and Supervisors											
Professionals											
Technicians											
Part-Time Seasonal											
Office & Clerical											
Craftsman (skilled)											
Operatives (semi-skilled)											
Laborers (un-skilled)											
Service Workers											
<b>Total:</b>											

REMARKS: Please explain any identification data appearing on last the report which differs from that given above. This includes major changes in employment, changes in composition of reporting units, and other pertinent information. Use a separate sheet if additional space is required.

**V. ADDITIONAL INFORMATION (Optional)**

Describe any other actions taken which show that all employees are recruited, hired trained, and promoted without regard to their race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity. Use a separate sheet if additional space is required.

**VI. POLICY STATEMENT**

The City of Canton, Ohio in conformance with local, state, and federal regulations, requires each vendor, contractor, and material suppliers working on city projects or awarded City contracts be signatures of the following statements:

- 1) It is the policy of \_\_\_\_\_ that equal employment opportunities be afforded to all qualified persons without regard to race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity.
  
- 2) In support of this document \_\_\_\_\_ will not discriminate against any employee or applicant because of race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity.
  
- 3) \_\_\_\_\_ will take affirmative action to insure that applicants for employment and current employees are treated fairly without regard to race, religion, color, sex, age, national origin, disability, sexual orientation, or sexual identity. Such action will include but not be limited to recruitment, advertising, or solicitation for employment, hiring, placement, upgrading, transfer or demotion, selection for training including apprenticeship rates of pay or other forms of compensation, layoffs or termination.
  
- 4) \_\_\_\_\_ will make every effort to comply with minority utilization goals as follows: (9%) nine percent minorities in your workforce on the job, (6.9%) six point nine percent female utilization on this job, and (10%) ten percent of contract amount expended with minority business enterprises, women-owned business enterprises or a combination of both.
  
- 5) \_\_\_\_\_ shall require each sub-contractor hired for this project to adhere to this statement.

**VII. SIGNATURE**

The undersigned certifies that he/she is legally authorized by the vendor/bidder to affirm all information and statements included in this employment practices report. That he/she has read all of the foregoing statements, representations, and affirmations and that they are true and correct to the best of his/her knowledge and belief. The undersigned, understands that if any of the statements and representations are made knowing them to be false or there is a failure to implement any of the stated intentions or objectives, set forth herein, without prior notice to the Office of Compliance, the bidder/contractor could be subject to loss of current and future awards.

**Firm or Corporation Name:**

\_\_\_\_\_

**Signature:**

\_\_\_\_\_

**Title:**

\_\_\_\_\_

**Date of Signing:**

\_\_\_\_\_

**VENDOR INFORMATION**

1. The vendor shall provide all of the following information.

a. Name of Vendor \_\_\_\_\_

b. Business Address \_\_\_\_\_

\_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip

c. Business Telephone Number ( \_\_\_\_ ) \_\_\_\_\_

d. Person, address, email and telephone to whom official notices are to be sent  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

e. Person, address, email and telephone for further information regarding this contract  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

f. State(s) of incorporation (w/dates of incorporation)  
\_\_\_\_\_  
\_\_\_\_\_

g. Principal place of business  
\_\_\_\_\_

h. Federal I.D. Number # \_\_\_\_\_

2. Form of Business Organization.

\_\_\_\_ Corporation                      \_\_\_\_ Partnership                      \_\_\_\_ Other

3. The vendor shall provide the names and addresses of all persons interested as principals (officers, partners, and associates) in this proposal. Write first name in full, and give titles for offices.

Four horizontal lines for providing names and addresses of principals.

All of the above, including the signatory to this contract, are citizens of the United States, except the following. (Provide names and addresses of those not a citizen of the United States.)

Four horizontal lines for providing names and addresses of non-citizens.

4. Name and address of other person, firms or companies interested in this contract.

Four horizontal lines for providing names and addresses of other interested parties.