**PART 1 GENERAL**

* 1. **SUMMARY**

1. Section Includes Tubelite aluminum interior framing and all components and installation accessories supplied with the system.
   1. Tubelite INT14 Interior Aluminum Framing system: 2” x 4-1/2”
   2. **RELATED PRODUCTS**
2. Single Manufacture: All products in divisions listed below shall be supplied by a single manufacturer. To ensure consistency in quality, warranty, finish, and product compatibility, products supplied by different manufacturers are not acceptable.
   1. Division 08 42 13 - Aluminum Framed Entrances: *<insert Tubelite entrance products>.*
   2. Division 08 43 13 – Aluminum Framed Storefronts: *<insert Tubelite storefront products>.*
   3. Division 08 44 13 - Glazed Aluminum Curtainwalls: *<insert Tubelite curtainwall / window wall products>.*
   4. Division 08 51 13 - Aluminum Windows: *<insert Tubelite aluminum window products>.*
   5. Division 08 13 16 – Aluminum Terrace Doors: *<insert Tubelite terrace door products>.*
   6. Division 10 71 13 - Exterior Sun Control Devices: *<insert Tubelite sun control products>.*
   7. Division 12 26 00 - Interior Daylighting Devices: *<insert Tubelite daylighting products>.*

*SPECIFIER NOTE: Review the following suggested Pre-installation Meeting and Agenda information and confirm that this Work is extensive enough to justify this meeting and edit for project specific meeting requirements.*

* 1. **ADMINISTRATIVE REQUIREMENTS**

1. Coordinate with installation of other components that comprise the exterior enclosure.
2. Pre-installation Meeting:
   * 1. Attendees: Owner’s Representative, Architect, General Contractor, Structural Engineer, Mechanical Engineer, Consultants, Interior Aluminum Framing Installer and Manufacturer’s Representative, structural support installers, and installers whose work interfaces with storefront and glazing, [\_\_\_\_\_\_\_].
   1. Agenda:
      1. Review and finalize construction schedule.
      2. Review code and project performance compliance documentation and testing requirements.
      3. Review product specific mockups and field-testing requirements.
      4. Verify availability of materials, installer’s personnel, equipment, and facilities required to maintain schedule.
      5. Review means and methods related to installation, including manufacturer’s written instructions.
      6. Examine support conditions for compliance with requirements including alignment and attachment to structural members.
      7. Review flashings, membrane interface with framing, wall penetrations, openings, and conditions of other construction affecting this Work.
      8. Review temporary protection requirements for during and after installation of this Work.
   2. **PERFORMANCE REQUIREMENTS**
3. Design Wind Loads
   1. Provide interior aluminum framing system with all structural components including but not limited to anchors and mullions based on the following wind load design pressures and the deflection and stress criteria of paragraph 1.04 B. Pressures based on Allowable Stress Design (ASD).
      1. [\_\_\_] psf positive and negative - typical zones  
         [\_\_\_] psf negative - corner zones.
      2. Basic Wind Speed of [\_\_\_] mph
         1. Exposure Category [I], [II], [III]
         2. Importance factor [1], [1.15], [\_\_\_]
      3. Design criteria based on [\_\_\_] building code *or* wind pressure diagram.

*NOTE: Tubelite is not responsible for determining design loads; this is the responsibility of the Engineer of Record for the building.*

1. Structural Performance:
   1. Structural Performance at design loads:
      1. System to withstand project design loads.
         1. Maximum allowable deflection of L/175 of the clear span for spans up to 13’-6” or L/240 of clear spans plus ¼” for spans greater than 13’-6” or an amount that restricts edge deflection of individual glazing lites of glass to ¾” whichever is smaller.
   2. Structural Performance at 1.5x design loads:
      1. System to withstand 1.5x design loads.
         1. There shall be no permanent deformation of main frame members in excess of 0.2% of its clear span, glass breakage, or permanent damage to fasteners or anchors.
         2. There shall be no glass breakage, permanent damage to frame members or anchors.
2. Acoustic Performance:
   1. The system shall have a sound transmission class (STC) and an outdoor-indoor transmission class (OITC) rating when tested per ASTM E90 and ASTM E1332. Coordinate performance with 08 80 00 Glazing.
      1. 1/2” laminated: STC 34, OITC 32 (1/4" CLR Annealed LAMI 4 Layers .060 EVA Clear, 1/4" CLR Annealed).
   2. **SUBMITTALS**
3. Product Data:
   1. Manufacturer’s literature for each specified system.
   2. Components within assembly, including material descriptions, component profiles, finishes, anchorage and fasteners, glazing, and internal drainage.
4. Shop Drawings:
   1. Shop drawings must be prepared by a qualified engineering service under the employ of the [window wall manufacturer] [installer].
   2. Include system dimensions, framed opening requirements and tolerances, affected related Work, anchorage, expansion and contraction joint location and details, and field welding required.
   3. Include scaled shop drawings showing detailed relationships with glazing, flashing, internal drainage, joinery, and provisions for thermal expansion.
5. Design Data: Submit framing member structural and physical characteristics, [engineering calculations], and [dimensional limitations].
6. Samples:
   1. System components: Submit corner samples, anchors, fasteners, trim, and other materials as requested by the architect.
   2. Finish: Submit [two] aluminum sheet stock samples [2” x 3”] for each finish type.
7. Warranty: Submit manufacturer sample warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
8. Optional [Sustainable Design Submittals] or [LEED Reports]:
   1. *MR4.1 and MR4.2 Recycled Content*: Submit documentation from manufacturer for amounts of pre-consumer and post-consumer recycled content by weight for the products specified.
   2. *EA Credit 1 Optimize Energy Performance*: Submit documentation from manufacturer showing energy performance of system(s) beyond the prerequisite standard.
   3. *IEQ Credit 7.1 Thermal Comfort*: Submit documentation from manufacturer reflecting use of natural ventilation products.
   4. *IEQ Credit 8.1 Daylight and Views*: Submit documentation from manufacturer showing the introduction of daylight and views into regularly occupied areas as a function of percentage of these spaces exposed to such daylight and views.
   5. *MR5.1 and MR5.2 Regional Materials*: Submit documentation from manufacturer showing a minimum of 10% up to 20% (based on cost) of building materials or products extracted, harvested, recovered, or manufactured within 500 miles of the project site.
   6. *MR3.1 and MR3.2 Resource Reuse*: Submit documentation from manufacturer reflecting use of a minimum of 5% up to 10% [based on weight] salvaged, refurbished, or reused materials.
   7. **QUALITY ASSURANCE**
9. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least twenty years of documented experience.
10. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State that the Project is located.
11. Installer: Company approved by manufacturer and specializing in performing work of this section with at least [\_\_\_] years of [documented] installation experience.
12. Source Limitations: Obtain the interior aluminum framing and all products listed in Section 1.02 from a single manufacturer.
    1. **DELIVERY, STORAGE, AND HANDLING**
13. Materials to be packed, loaded, shipped, unloaded, stored, and protected in accordance with AAMA CW-10.
14. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.
    1. **FIELD CONDITIONS**
15. Field Measurements: Verify dimensions of interior framing openings by field measurements and indicate measurements on Shop Drawings.
16. Coordinate installation with other applicable trades.
    1. **WARRANTY**
17. Interior Aluminum Framing Warranty:
    1. Manufacturer agrees to repair or replace defective storefront components for a period of 2 [3][5][10] years from the date of shipment. *<3, 5, and 10 years optional>.*
18. Finish Warranty:
    1. Warranty covers factory-applied organic and anodic finishes on exposed extruded aluminum surfaces without standing water accumulation, against peeling, checking, cracking, chalking and change of color, per applicable AAMA specifications.
       1. Paint Coatings
          1. AAMA 2605 70% PVDF:  10 [20] years *<20 years optional>*
          2. AAMA 2604 50% PVDF: 5 [10] years *<10 years optional>*
          3. AAMA 2603 Baked Enamel: 1 year (adhesion only)
       2. Anodized Coatings
          1. AAMA 611 Class I:   5 [10] years *<10 years optional>*
          2. AAMA 611 Class II:  2 years

*NOTE: Refer to Tubelite Limited Warranty and Finish Warranty for detailed exclusions, qualifications, and limitations. When warranties are required, verify with Owner's counsel that warranties stated under this article are not less than remedies available to Owner under prevailing local laws. Verify the length of available warranties on the actual finish being specified.*

**PART 2 PRODUCTS**

* 1. **MANUFACTURER**

1. Basis of Design: Interior Aluminum Framing
   1. Tubelite Inc. INT14 Interior Aluminum Framing system: 2” x 4-1/2” (non-thermal), ctr. set, flush glazed.
   2. Substitutions
      1. Manufacturer’s products that meet specified design requirements may be considered as a substitution. Substitution requests / submittals must include the following and be submitted at least ten working days prior to the bid date.
         1. Submittal information must include test reports as specified in performance sections.
         2. Copy of manufactures warranty
         3. Any additional information as requested
         4. System details / samples
   3. **INTERIOR ALUMINUM FRAMING**
2. Interior Aluminum Framing: Factory or field fabricated, field glazed, factory finished aluminum, screw spline construction with infill and related anchorage and attachment devices.
   1. System dimensions primary mullion: 2” x 4-1/2”
      * 1. Exterior face dimensions: 2”
        2. Depth: 4-1/2”
      1. Optional mullions
         1. Outside Corner: 90o: 4-1/2” x 4-1/2” extruded outside corner *<select>*
         2. Drywall Jamb: 2” x 4-1/2” Jamb with drywall 1” x variable depth (two-piece ratcheting) “wrap”*<select>*
         3. Three-Way Corner: 180o: 4-1/2” x 4-1/2” extruded outside corner/intermediate mullion *<select>*
         4. Vertical Post: 180o: 4-1/2” x 4-1/2” *<select>*
      2. Channel frames
         1. Head: 2” x 1-1/4”
         2. Sill: 1” x 1-1/4”
      3. Door frames (options)
         1. Aluminum frame for (accommodating 1-3/4” std. door leaf): 1-3/4” x 4-1/2” *<select>*
         2. Aluminum frame for (accommodating 1-3/4” std. door leaf): 2” x 4-1/2” *<select>*
         3. Aluminum for (accommodating 1-3/4” std. **wood** door leaf): 1-3/4” x 4-1/2” *<select>*
         4. Aluminum for (accommodating 1-3/4” std. **wood** door leaf): 2” x 4-1/2” *<select>*
         5. Aluminum “slick tube” door header frame (accommodates glass doors by others) *<select>*.

* 1. Glazing:
     1. Position: center of system
     2. Thickness: [1/2” std.] [1/4”] [5/16”] [3/8”] [7/16”] [9/16”] [5/8”] [11/16”] [3/4”] *<specify>*
  2. Construction: screw spline and snap clips
  3. **FINISHES**

1. Finish all exposed areas of aluminum storefront components in accordance with applicable AAMA Voluntary Finish Guide Specification: *<select from list below>.*

|  |  |  |  |
| --- | --- | --- | --- |
| **SPECIFICATION** | **DESCRIPTION** | **DESIGNATION** | **COLOR** |
| AAMA 2605 | 70% PVDF [2][3][4] coat *<select>* | Exterior Paint | [ ] *<specify color name/number>* |
| AAMA 2604 | 50% PVDF [2][3][4] coat *<select>* | Exterior Paint | [ ] *<specify color name/number>* |
| AAMA 2603 | Baked enamel | Interior Paint | [ ] *<specify color name/number>* |
| AAMA 611 | Class I - Color anodize coating,  Eco-friendly etch (0.7 mils thick min) | AA-M10C21A44 | [Light Bronze], [Medium Bronze], [Dark Bronze] [Extra Dark Bronze], [Black], [Champagne], [Light Champagne], [Copper],[other] *<select >* |
| AAMA 611 | Class I - Clear anodize coating,  Eco-friendly etch (0.7 mils thick min) | AA-M10C21A41 | Clear |
| AAMA 611 | Class II - Clear anodize coating Eco-friendly etch (0.4 mils thick min) | AA-M10C21A31 | Clear |

1. Combination anodic oxide and transparent organic coatings as defined in AAMA 612 are not equivalent substitutions for the AAMA 611 anodized finishes shown above due to surface hardness disparities.
2. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
3. Verify accuracy of components, quantities, and sizes prior to application of finishes.
4. Applicator – PVDF Based Finishes:
   1. Use regenerative thermal oxidizer to destroy VOC’s.
   2. Utilize chrome-based five –stage pretreatment system applied in accordance with AAMA and ASTM standards. Use of a chrome-based five-stage system ensures long-term adhesion and an option for an extended warranty.
   3. Possess in-house blending capabilities, allow for only specific amount of paint needed for each project.
   4. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
   5. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
   6. Utilize documented quality control protocol in accordance with AAMA procedures.
5. Applicator – Anodize Finishes
   1. Offer both standard eco-friendly (acid) and optional caustic (traditional) etching technologies.
   2. Utilize fully automated, computer-controlled process lines for consistency through Project.
   3. Utilize documented quality control protocol in accordance with AAMA 611 procedures.
      1. Online quality assurance inspection:
         1. Random sample check for color uniformity, maximum difference of 5AE.
         2. Random coating thickness testing:
            1. Class I clear, and color anodize – 0.7 mils (18 microns)
            2. Class II clear anodize – 0.4 mils (10 microns)
   4. **MATERIALS**
6. Aluminum extrusions: Alloy 6063-T6 or 6063-T5 in accordance with ASTM B221 and extruded within commercial tolerances and free from defects that impair strength and/or durability.
   1. Optional recycled aluminum: *<specify as required>*
      1. Provide EcoLuminum™ by Tubelite containing 70% recycled aluminum comprised of 55% pre-consumer and 15% post-consumer material.
7. Primary extruded framing members will be a minimum 0.080" thick.
8. Glazing material:
   1. Setting blocks and Edge Blocking: Provide in sizes and locations and materials as recommended by glass manufacturer.
   2. Glazing gaskets shall be EPDM (avail. In grey or black *<specify as required>*) and compatible with all materials in contact.
   3. **FABRICATION**
9. Ensure joints and corners are flush and accurately fitted and secured.
10. Prepare framework to receive anchors and hardware.
11. Conceal fasteners and attachments from view.
    1. Fabricate in accordance with manufacturer’s instructions.
    2. **COMPONENTS**
12. Glass
    1. Provide in accordance with Section 08 80 00.
13. Glazing
    1. Glazing method shall be in accordance with manufacturer installation instruction and the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
    2. Refer to Section 08 80 00 for requirements.

**PART 3 – EXECUTION**

* 1. **VERIFICATION OF CONDITIONS**

1. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of this Work.
2. Notify Contractor in writing, with a copy sent to Owner and Architect, of any conditions detrimental to proper and timely completion of this Work.
3. Proceed with installation only after unsatisfactory conditions have been corrected.
4. Start of this Work shall indicate acceptance of areas and conditions as satisfactory by the Installer.
   1. **INSTALLATION**
5. Install interior aluminum framing in accordance with manufacturer's installation instructions, reviewed product data, approved shop drawings, and as indicated on Drawings (per Professional Engineer review when applicable).
6. Do not install damaged components.
7. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
8. Provide alignment attachments and shims to permanently fasten system to building structure.
9. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, [aligning with adjacent work].
10. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
11. Install hardware using templates provided.
    1. Refer to Section 08 71 00 for hardware installation requirements.
12. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
13. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
14. Tolerances:
    1. Maximum variation from plumb: [1/16”] every 3’ non-cumulative, or [1/16”] per 10’, whichever is least.
    2. Maximum Misalignment of two adjoining members abutting in plane: [1/32”].
    3. **CLEANING**
15. Comply with AAMA 609 and 610 for methods, equipment, and materials to clean finished aluminum after installation and for subsequent periodic maintenance.
16. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners, and wipe surfaces clean.
17. Remove excess sealant from glass and aluminum by method acceptable to sealant and finish manufacturer.  
    1. **PROTECTION**
18. Protect installed products from damage during subsequent construction.
19. Protect anodized finishes from prolonged exposure to alkaline, such as lime in masonry mortar, or acidic and other corrosive materials.

DISCLAIMER STATEMENT

*This guide specification is intended to be used by a qualified construction specifier. The guide specification is not intended to be verbatim as a project specification without appropriate modifications for the specific use intended. The guide specification must be used and coordinated with the procedures of each design firm, and the particular requirements of a specific construction project.*

*Tubelite reserves the right to change configuration without prior notice when deemed necessary for product improvement.*

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**END OF SECTION 08 43 13**

This document supersedes all previous versions.