**PART 1 GENERAL**

* 1. **SUMMARY**
1. Section Includes Tubelite aluminum sunshades and all components and installation accessories supplied with the system.
	1. Tubelite Maxblock® Series Sunshades
		1. Maxblock® Airfoil *<select>*
		2. Maxblock® Z Blade *<select>*
		3. Maxblock® Tubular *<select>*
		4. Maxblock® Single Blade *<select>*
	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*
	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 12 26 00 - Interior Daylighting Devices: *<insert Tubelite daylighting products>.*

* 1. **ADMINISTRATIVE REQUIREMENTS**
1. Coordinate with installation of other components that comprise the exterior enclosure.
2. Pre-installation Meeting:
	1. Attendees:
		1. Owner
		2. Architect
		3. General Contractor
		4. Installer
	2. **PERFORMANCE REQUIREMENTS**
3. Design Wind Loads
	1. Provide aluminum sunshade system, including but not limited to anchorage capable of withstanding wind load design pressures based on the following:
		1. [\_\_\_] psf positive / negative pressures in typical zones and [\_\_\_] negative pressures at corner zones.
		2. Basic Wind Speed of [\_\_\_] mph
			1. Exposure Category (I,II,III) [\_\_\_]
			2. Importance factor (1, 1.15) [\_\_\_]
		3. Local building codes
		4. The design snow load for the project will be \_\_\_ psf acting vertically downward. Apply drift factor per applicable code.
		5. Ice loads shall be based on ASCE 7-[\_\_\_] for the project location.

*NOTE: Tubelite is not responsible for determination of design loads. This information is the responsibility of the building’s design engineer.*

1. Structural Performance Requirements
	1. Sunshades shall be designed to withstand specified design loads without damage, disengagement or permanent deformation.
	2. Assemblies shall be capable of supporting a concentrated load of [\_\_\_\_] lbf at any point without damage, permanent deformation, or disengagement of any component.

* 1. **SUBMITTALS**
1. See Section 01 30 00 – Administrative Requirements, for submittal procedures.
2. Product Data: Submit for each component within assembly, including material descriptions, component profiles, finishes, anchorage and fasteners, glazing, and internal drainage.
3. Shop Drawings: Submit system dimensions, tolerances, anchorage, affected related Work, expansion and contraction joint location and details, and field welding required.
4. Include scaled shop drawings showing detailed relationships with adjacent products, anchorage, joinery, and provisions for thermal expansion.
5. Design Data: Submit framing member structural and physical characteristics, [engineering calculations], and [dimensional limitations].
6. Samples: Submit [two] or [\_\_\_] aluminum sheet stock samples [2 inch x 3 inch long] illustrating aluminum surface finish as indicated.
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 for products specified, and include statement indicating costs of materials having recycled content.
	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 cost) salvaged, refurbished or reused materials.
	7. **QUALITY ASSURANCE**
9. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least [twenty] or [\_\_\_] 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 specializing in performing work of this section and approved by manufacturer with at least [\_\_\_] years of [documented] experience.
12. Source Limitations: Obtain each component of sunshades from single source and from single manufacturer.
	1. **DELIVERY, STORAGE, AND HANDLING**
13. Handle aluminum products of this section 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. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.
16. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fabrication of curtain wall framing and indicate measurements on Shop Drawings.
	1. Coordinate with construction schedule.
17. Install sealant according to sealant manufacturer guidelines.
	1. **WARRANTY**
18. Aluminum Sunshade Framing Warranty:
	1. Manufacturer agrees to repair or replace defective sunshade components for a period of 2 [3][5][10] years from the date of shipment. *<3, 5, and 10 years optional>.*
19. 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 – Aluminum Sunshades
	1. Tubelite Inc. Maxblock® Sunshades [Airfoil] [Z Blade] [Tubular] [Single Blade] *<specify one or more>.*
	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 (10) 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. **ALUMINUM SUNSHADES**
2. Aluminum sunshades: Shop or field fabricated, factory finished aluminum screw-spline framing members, and related flashing, anchorage and attachment devices.
	1. Outrigger projection:
		1. Airfoil: [20” 3 blades] [24” 4 blades] [30” 5 blades] [35” 6 blades] [other] *<select>*
		2. Z Blade: [20” 3 blades] [24” 4 blades] [30” 5 blades] [35” 6 blades] [other] *<select>*
		3. Tubular: [20” 3 blades] [24” 4 blades] [30” 5 blades] [35” 6 blades] [other] *<select>*
		4. Single Blade (horizontal): [6” blade] [9” blade] *<select>*
	2. **FINISHES**
3. Finish all exposed areas of aluminum sunshade 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 coatingEco-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. Extruded Aluminum: Alloy 6063-T6 in accordance with ASTM B221, and extruded within commercial tolerances and free from defects that impair strength and/or durability.
7. Optional Recycled Content: For aluminum extrusions, except those required for doors and door frames, provide manufacturer’s product fabricated from aluminum with 70 percent or greater recycled content.
	1. Product: EcoLuminum™ by Tubelite Inc.
8. Structural Steel Sections: ASTM A36/A36M; [galvanized in accordance with requirements of ASTM A123/A123M] or [shop primed]. Refer to Section 05 1200.
	1. Where galvanizing is not compatible with alloy of component parts, apply heavy coating of epoxy paint where necessary to prevent galvanic action with dissimilar materials.
9. Structural Supporting Anchors: Refer to Section 05 12 00.
10. Fasteners: [Stainless] or [Galvanized] steel.
11. Inserts: Provide galvanized steel or cast iron inserts of suitable design and adequate strength for condition of use.
12. Galvanizing Repair Paint: High zinc content paint for over welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and in compliance with SSPC Paint 20.
13. Bituminous Paint: Cold applied asphalt mastic, containing no asbestos fibers.
	1. **FABRICATION**
14. Ensure joints and corners are flush, hairline and weatherproof, accurately fitted and secured.
	1. Prepare framework to receive anchors and hardware.
	2. Conceal fasteners and attachments from view.
	3. Reinforce framework as required for imposed loads.
15. Construction: Eliminate noises caused by wind and thermal movement, and prevent vibration harmonics.
16. Movement: Allow for movement between curtain wall and adjacent construction, without damage to components.
17. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

**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.
	1. **PREPARATION**
4. Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, and other accessories to be embedded in concrete or masonry construction.
	1. Coordinate delivery of these items to Project site.
	2. **INSTALLATION**
5. Install aluminum sunshade assemblies 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 accessories with positive anchorage to building, weather tight mounting, provisions for thermal expansion, and coordinate installation with flashings and other components.
12. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
	1. **TOLERANCES**
13. Maximum Variation from Plumb: [0.06 inches] or [<\_\_\_> inches] every 3 ft non-cumulative, or [1/16 inches] or [<\_\_\_> inches] per 10 ft, whichever is least.
14. Maximum Misalignment of Two Adjoining Members Abutting in Plane: [1/32 inch] or [<\_\_\_> inch].

	1. **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 44 13**

This document supersedes all previous versions.