

HDC-ADDITIONAL INFORMATION SUBMISSION PACKAGE

CAPITOL PARK DECK—1405 GRISWOLD-EPLANS#2021-04620

Response Date: 1/6/2022

1, Further explain current vs proposed conditions

- The proposed storefront system will match the existing exactly, except it will not have the random horizontal aluminum curtain wall pieces that break up the individual glass pieces. Also, the depth from the glass to the face of the 2" wide vertical aluminum pieces will be 3/4" where the original depth is about 1.5" The finish will be aluminum, door location and sizes, overall height and width of structure, glass height, top and bottom orange panel sizing and location will match the existing. Aluminum curtain wall pieces that separate each individual glass piece will be 2" wide (match existing). Again, the only difference is the horizontal pieces that break up the glass panels will not be used.

2. Further document the current conditions and why the storefront cannot be repaired vs. replaced.

- See attached letter from Blackberry Window + Door Systems regarding the current conditions and need for replacement

3. Provide High Resolution Photos

- .Jpg photos of existing façade system are included in this response, also see Blackberry letter regarding the failing conditions.

4. Provide dimensioned technical drawings of current and proposed.

- Plans in elevation are provided and all dimensioning of the new vs. original system is the same other than the removal of the horizontal muntins and the depth of the aluminum storefront. Finish or original and new proposed system is both aluminum. We believe with this email and what has been provided, sufficient information on the dimensioning and overall scope has been provided.

5. Provide technical drawings from manufacturer for the proposed curtainwall system (Tubelite CW200 Series, according to the attached doc)

- See included PDF form Tubelite website with further technical information



1/5/2022

Capitol Park Deck LLC
401 S. Washington
Suite 102
Lansing, MI 48933

Re: 1405 Griswold Storefront/Glazing Replacement

To: William Goldberg

Per your request, we inspected the existing aluminum storefront glazing system at 1405 Griswold St. and determined the replacement is required rather than repair as evidenced by the follow conditions.

1. The existing system is a non-thermally broken Kawneer Curtain Wall System, dating back to the 1960's. This was a clear anodized tubular system and the structural engineering at that time would no longer be acceptable to industry standards today.
2. The existing system has numerous areas of air and water penetration. The original glazing gaskets have shrunk and, in some cases, deteriorated and is missing.
3. This is a monolithic glazed system using 1/4" glass. As a result, the single pane glazing, and the lack of thermal breaks only provide and overall R-value of 1.0.
4. There has been deterioration of the anchorage since the has been a bi-metallic reaction between the steel anchors and the aluminum framing.
5. There is need for new framing components such a glazing covers and horizontal mullions that are missing or damaged. There are no parts available for replacement because of the age of the system.

Please let me know if you have any questions?

Sincerely

A handwritten signature in cursive script that reads "MK Shields".

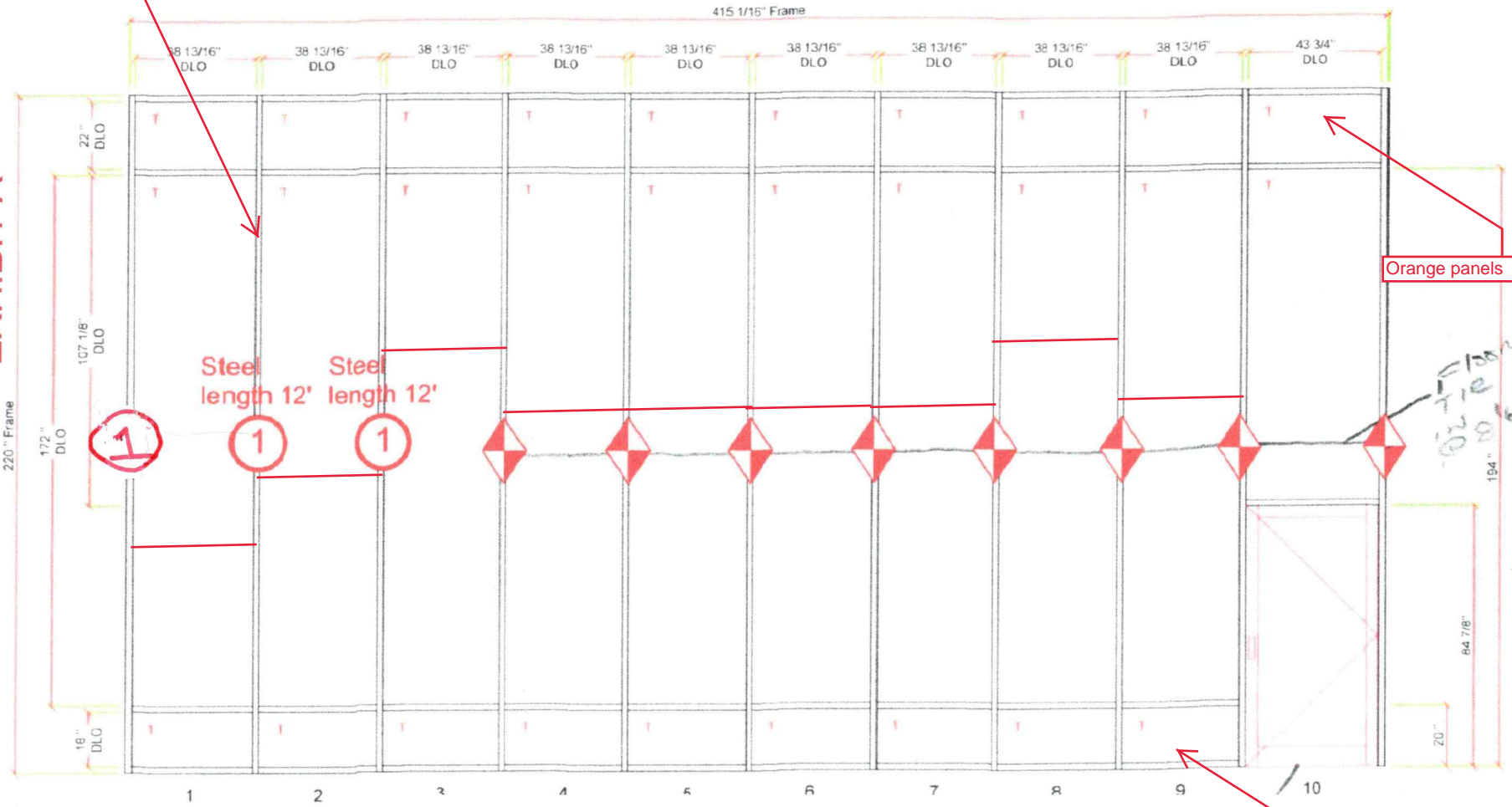
Michael Shields
President
BlackBerry Systems

Original Storefront

- 2" wide aluminum curtain wall
- Random horizontal aluminum extrusions 1/2"-1" wide
- Orange top and bottom panels

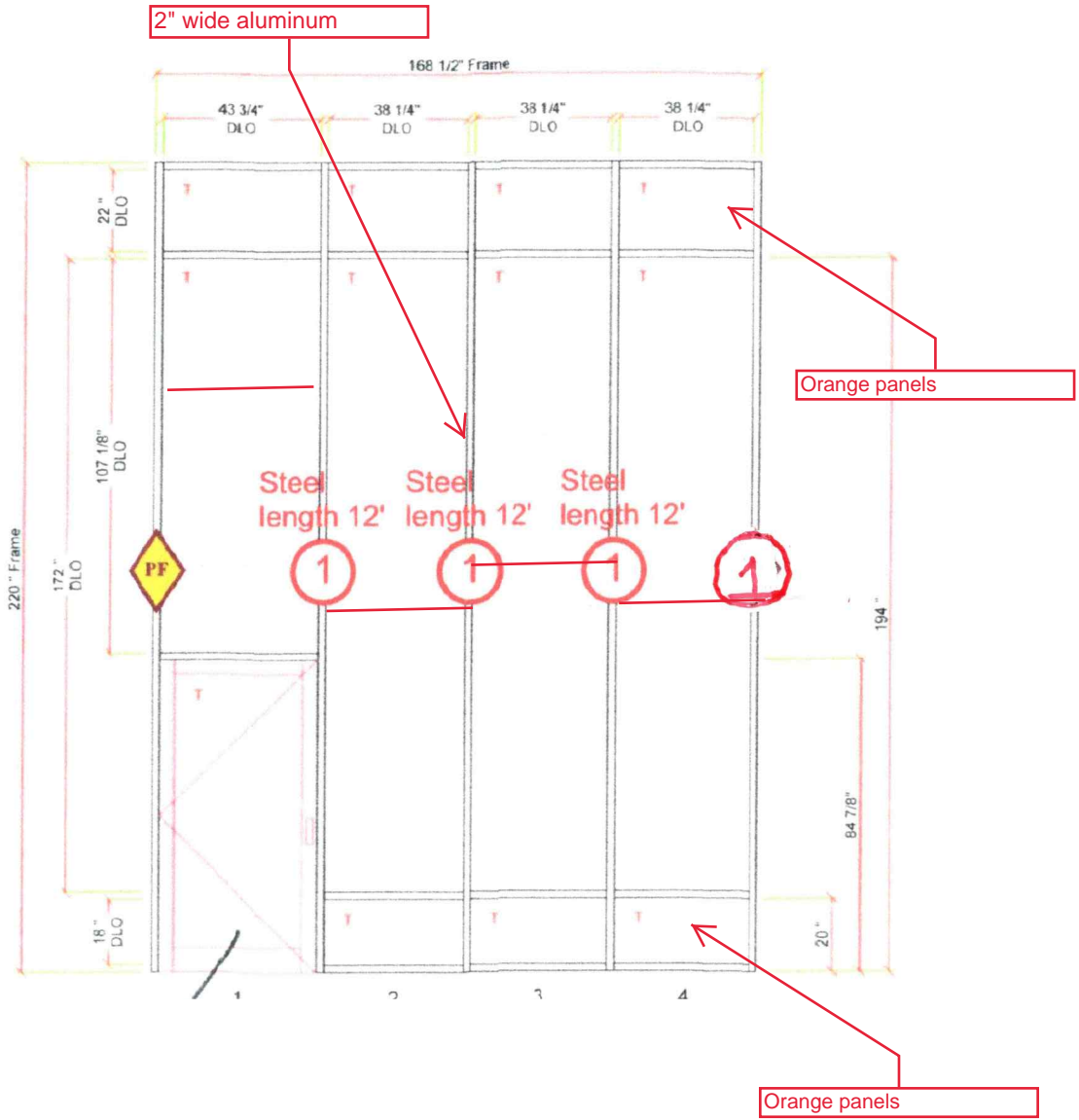
2" wide aluminum

EXHIBIT A



Orange panels

Orange panels



NEW STOREFRONT

- 2" aluminum curtain wall
- top and bottom orange panels

EXHIBIT A

Products Used & Notes	Design Criteria	Symbol / Note Key												
<p>Framing System: 200CW Frame Profile: 2" x 6"</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #ffff00;"> <th colspan="2">Design Criteria</th> </tr> <tr> <td style="width: 50%; vertical-align: top; padding: 2px;"> <p>WIND LOAD CRITERIA:</p> <p>Wind Speed: 115 mph Risk Category: II Exposure: B Building Height: 25' - 0"</p> <p>Corner WL: 16.3 psf</p> <p>Interior Vestibule WL: 10 psf Interior WL: 5 psf</p> </td> <td style="width: 50%; vertical-align: top; padding: 2px;"> <p>DEFLECTION CRITERIA:</p> <p><u>LATERAL DEFLECTION:</u></p> <p>L/175 for spans less than 13' - 6" or 3/4" per life L/240 + 1/4" for spans greater than 13' - 6"</p> <p><u>LATERAL CANTILEVER DEFLECTION:</u></p> <p>2L/175</p> <p><u>DEFLECTION PARALLEL TO GLAZING PLANE:</u></p> <p>1/8" Maximum</p> </td> </tr> </table>	Design Criteria		<p>WIND LOAD CRITERIA:</p> <p>Wind Speed: 115 mph Risk Category: II Exposure: B Building Height: 25' - 0"</p> <p>Corner WL: 16.3 psf</p> <p>Interior Vestibule WL: 10 psf Interior WL: 5 psf</p>	<p>DEFLECTION CRITERIA:</p> <p><u>LATERAL DEFLECTION:</u></p> <p>L/175 for spans less than 13' - 6" or 3/4" per life L/240 + 1/4" for spans greater than 13' - 6"</p> <p><u>LATERAL CANTILEVER DEFLECTION:</u></p> <p>2L/175</p> <p><u>DEFLECTION PARALLEL TO GLAZING PLANE:</u></p> <p>1/8" Maximum</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #ffff00;"> <th colspan="2">Symbol / Note Key</th> </tr> <tr> <td style="width: 10%; text-align: center; vertical-align: middle;"> </td> <td style="padding: 2px;">1-1/2" x 3-1/2" steel bar centered on span</td> </tr> <tr> <td style="text-align: center; vertical-align: middle;"> </td> <td style="padding: 2px;">Wind load anchor</td> </tr> <tr> <td style="text-align: center; vertical-align: middle;"> </td> <td style="padding: 2px;">Perimeter "F" Anchor</td> </tr> </table>	Symbol / Note Key			1-1/2" x 3-1/2" steel bar centered on span		Wind load anchor		Perimeter "F" Anchor
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TUBELITE
DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS

Project:	Urban Bean
Reviewed By:	Carlos Soto
Date:	8/18/2020

DISCLAIMER:
THIS REVIEW BY TUBELITE INC. SHALL NOT BE CONSIDERED AS AN ENDORSEMENT OR APPROVAL BY A PROFESSIONAL ENGINEER.

THIS REVIEW IS PROVIDED FOR THE PURPOSES OF ESTIMATING ONLY. REFERENCES TO WINDLOAD, STRUCTURAL LOADS AND REACTIONS, DEFLECTION ANCHORING, SPLICE JOINTS, REINFORCEMENT, BACKMEMBERS OR THERMAL EXPANSION ARE PROVIDED AS A GUIDELINE FOR INSTALLATION. IT IS THE RESPONSIBILITY OF THE INSTALLER TO VERIFY THAT THE PRODUCT MEETS ALL APPLICABLE CODES AND REQUIREMENTS. VERIFICATION BY REGISTERED PROFESSIONAL ENGINEER IS RECOMMENDED.

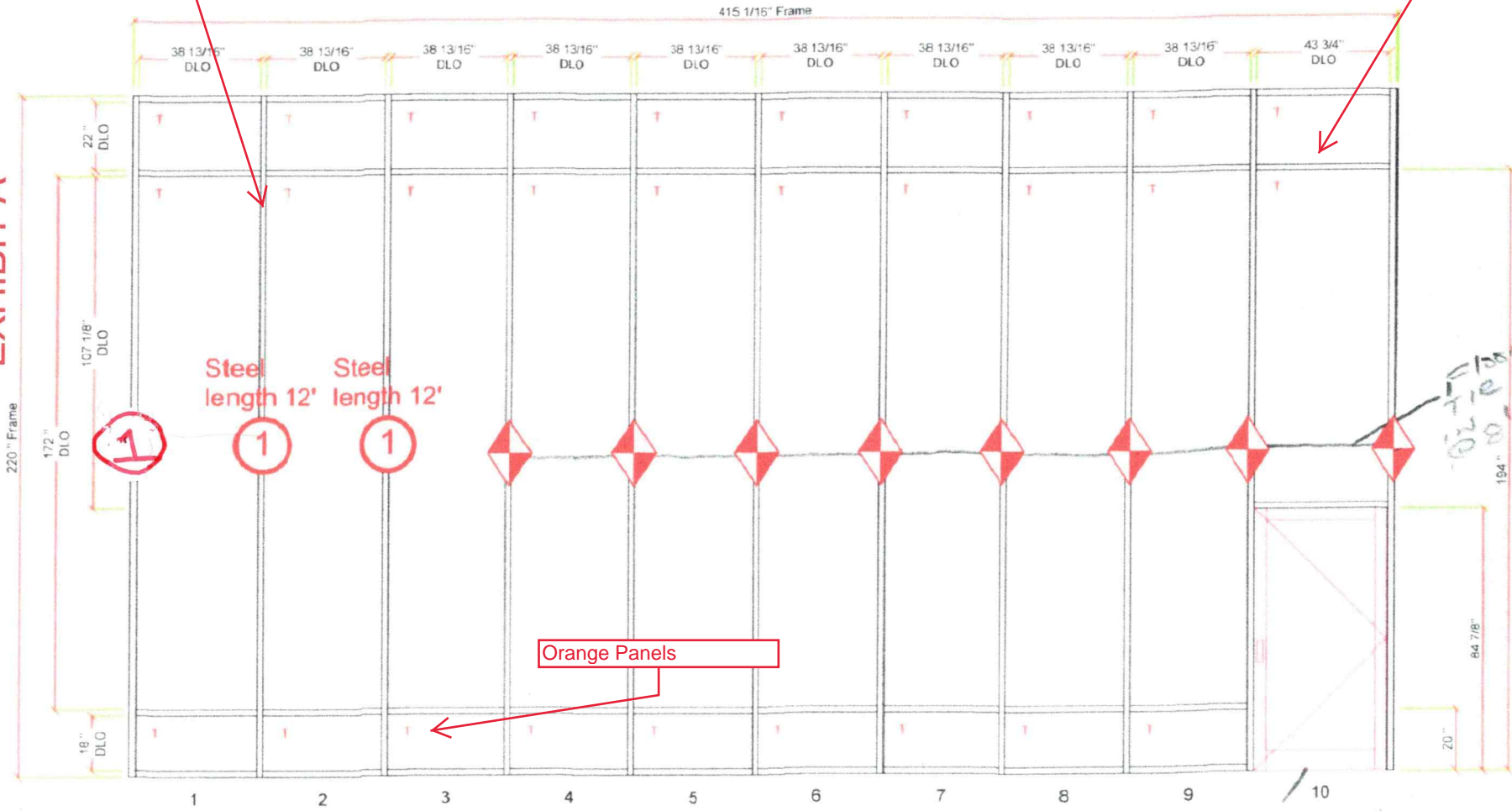
NEW STOREFRONT
-2" aluminum curtain wall
-top and bottom orange panels

and Gem Services
BEAN

2" wide aluminum

Orange Panels

EXHIBIT A

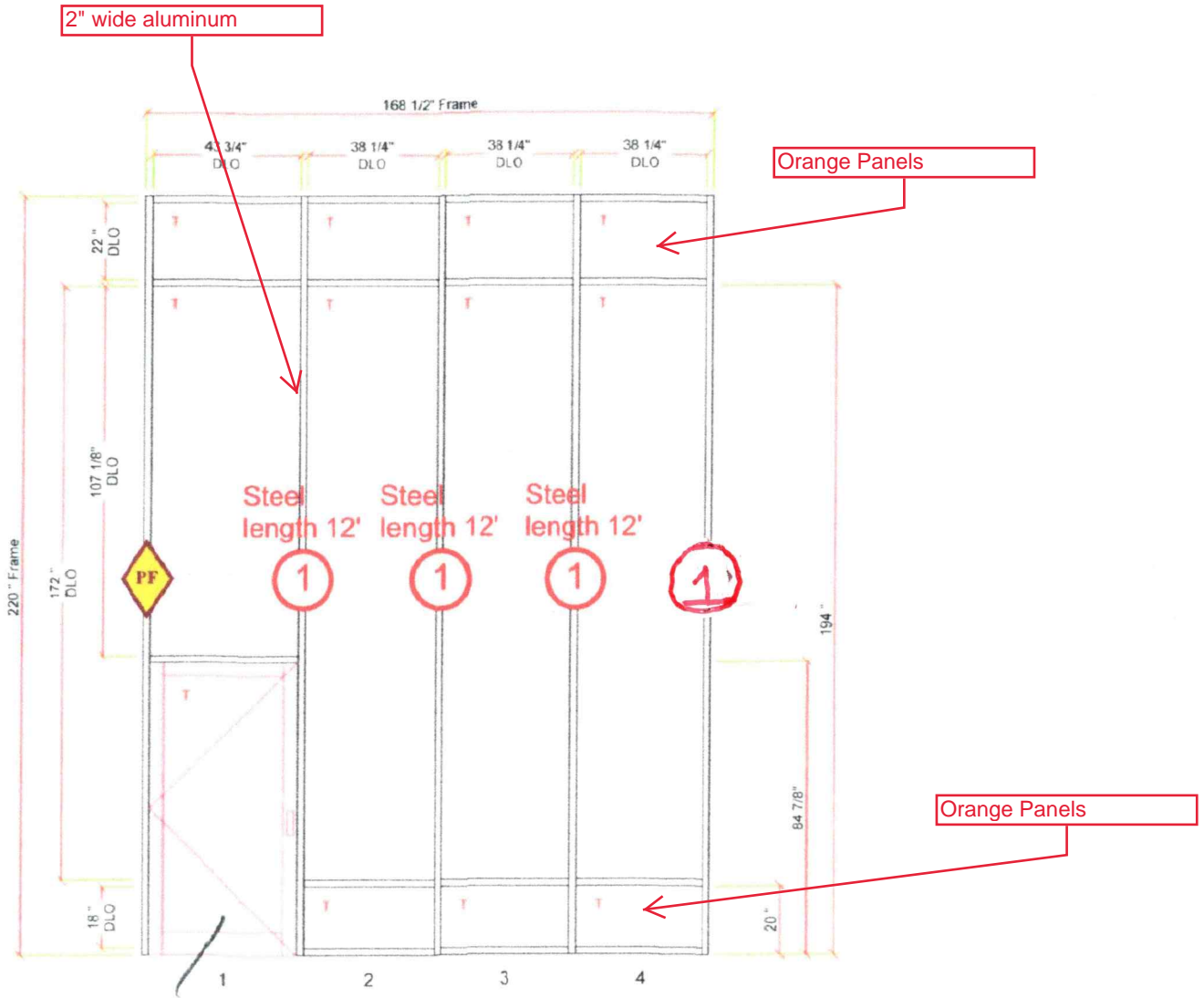


Orange Panels

02-20-00
00 00 00

American Gem Services
URBAN BEANS

EXHIBIT A



200 Series Curtainwall

The 200 Series Curtainwall is an economical system with a wide range of low- to mid-rise applications including atriums and clerestory. This exterior-glazed pressure bar system with 2" face dimension is ideal for curving and compatible with all Tubelite entrances.

Snap-on cover finishes, available in a variety of colors, allow for contrasting interior and exterior finishes on exposed framing. Silicone-glazed verticals can be selected to provide a sleek uninterrupted surface.

Both our 200 and 400 Series Curtainwall systems are subjected to rigorous testing by an independent agency, ensuring that you get the highest quality curtainwall products that the industry has to offer.

*200 Curtainwall, T14000 I-O
Storefront, Medium Stile Doors,
Mountain Tech III, Lindon, UT
Photographer: Cache Valley
Photographers*



**Standard Narrow
Stile Entrances**



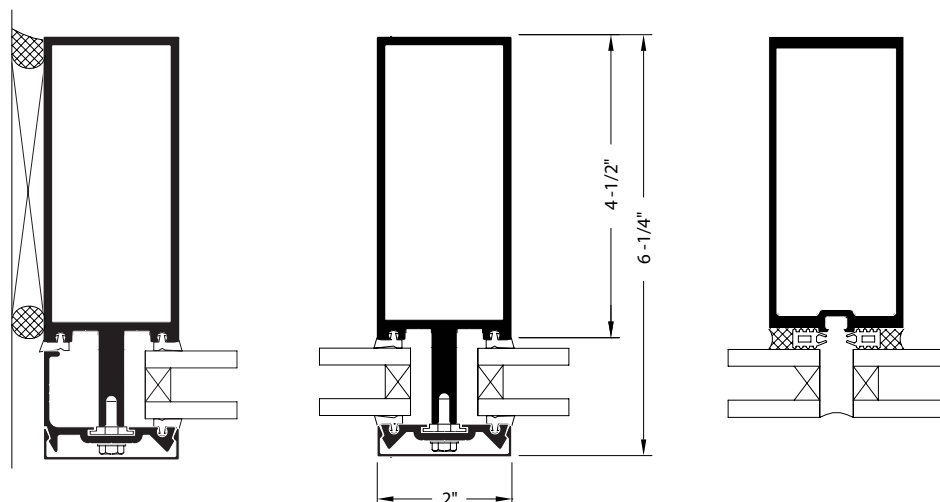
**14000 I/O Series
Multiplane
Storefront Framing**

**ALSO
USED
WITH**

TUBELITE®
DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS

200 Series Curtainwall



System Features:

- Standard 4-1/8" (104.8mm) to 7-3/4" (196.9mm) depth systems
- 2" (50.8mm) sight line matches Tubelite storefront systems for insulated glass
- Outside glazed pressure-plate system available in captured and structural glazed configurations
- Standard infill option 1" (25.4mm), other infills available
- Thermally Improved using a continuous 1/8" (3.2mm) EPDM Isolator
- Can be shop-fabricated and shop-glazed for labor savings
- Silicone compatible glazing materials for long-lasting seals
- Captured & SSG inside and outside corners available

Optional Features:

- Steel reinforcing available
- Optional deep profile and bull nose covers available
- Silicone glazed intermediate verticals & horizontals available
- Easily integrates with Tubelite's, Entrances, 3700 and Phantom 5000 Insert Vents, Maxblock Sunshades, and aLuminate Light Shelves
- Deep and heavy-weight mullions available

200 Series Curtainwall Product Specifications

Application: Low and mid-rise commercial buildings including retail, office, healthcare, schools, etc.

Description: 2" x 4-1/4" to 7-3/4" field glazed, shear block construction curtainwall

Face Width:	Overall Depths:	Glass:	Air Infiltration:	Water Infiltration:	Structural:	U-Factor**:	CRF:	Acoustic:
2"	4-1/4" to 7-3/4"	1" (1/8" to 1")	0.06 CFM/Ft.2 @ 6.24 PSF	15 PSF – Static 15 PSF – Dynamic	60 PSF – Design 90 PSF – Overload	0.39 – Captured 0.32 – SSG	68	32 STC 26 OITC

** U-Factor per NFRC 100: COG = 0.24 with warm edge spacer, 1-3/4" x 4-1/2" non-thermal frame.

Refer to the U-Factor table at: www.tubeliteinc.com/products/curtainwall/200-series-curtainwall/ for other glass makeups and configurations.

DISCLAIMER: Tubelite takes no responsibility for product selection or application, including, but not limited to, compliance with building codes, safety codes, laws, merchantability or fitness for a particular purpose; and further disclaims all liability for the use, in whole or in part, of this Technical Guide in preparation of project specifications and/or other documents. Technical Guides are subject to change at any time, without notice, and at Tubelite's sole discretion. ©2018 Tubelite Inc.

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DEPENDABLE

LEADERS IN ECO-EFFICIENT STOREFRONT,
CURTAINWALL AND ENTRANCE SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes Tubelite aluminum curtainwall and all components and installation accessories supplied with the system.
1. Tubelite 200 Series Curtainwall systems: 2" x [6", 6-1/2", 8", other] <select>

1.02 RELATED PRODUCTS

- A. 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.
- a. Division 08 42 13 - Aluminum Framed Entrances: <insert Tubelite entrance products>.
 - b. Division 08 43 13 – Aluminum Framed Storefronts: <insert Tubelite storefront products>.
 - c. Division 08 51 13 - Aluminum Windows: <insert Tubelite aluminum window products>.
 - d. Division 08 13 16 – Aluminum Terrace Doors: <insert Tubelite terrace door products>.
 - e. Division 10 71 13 - Exterior Sun Control Devices: <insert Tubelite sun control products>.
 - f. 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.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Pre-installation Meeting:
- a. Attendees: Owner's Representative, Architect, General Contractor, Structural Engineer, Mechanical Engineer, Consultants, Curtainwall Installer, Curtainwall Manufacturer's Representative, structural support installers, and installers whose work interfaces with curtainwall and glazing, [_____].
2. Agenda:
- a. Review and finalize construction schedule.
 - b. Review code and project performance compliance documentation and testing requirements including product certification for energy (U-value, SHGC), condensation, ADA, acoustics, etc.
 - c. Review product specific mockups and field testing requirements.
 - d. Verify availability of materials, installer's personnel, equipment, and facilities required to maintain schedule.
 - e. Review means and methods related to installation, including manufacturer's written instructions.
 - f. Examine support conditions for compliance with requirements including alignment and attachment to structural members.
 - g. Review flashings, membrane interface with curtainwall, wall penetrations, openings, and conditions of other construction affecting this Work.
 - h. Review temporary protection requirements for during and after installation of this Work.
 - i.

1.04 PERFORMANCE REQUIREMENTS

- A. Design Wind Loads
1. Provide aluminum curtainwall 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).
 - a. [] psf positive and negative - typical zones
[] psf negative - corner zones.
 - b. Basic Wind Speed of [] mph
 - i. Exposure Category [I],[II], [III]
 - ii. Importance factor [1], [1.15], []
 - c. 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.

- B. Air, Water and Structural Performance:
 - 1. Air Infiltration Performance:
 - a. Shall not exceed 0.06 cfm/ft² at 6.24 psf static air pressure differential, when tested per ASTM 283.
 - 2. Water Infiltration Performance:
 - a. Static: No uncontrolled water entry at a 15 psf static pressure differential with water applied at a minimum rate of 5 gal/ft² hr when tested per ASTM E 331.
 - b. Dynamic: No uncontrolled water entry at 15 psf dynamic pressure with water applied at a minimum rate of 5 gal/ft²hr when tested per AAMA 501.1.
 - 3. Structural Performance:
 - a. Design Loads: System to withstand +/- 60 psf when tested per ASTM E330.
 - i. 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.
 - b. 1.5x Design Loads: System to withstand +/- 90 psf when tested per ASTM E330.
 - i. 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.
 - 4. Seismic Movement:
 - a. Elastic Interstory Horizontal Movement: Design displacement at 0.010 x the story height per AAMA 501.4.
 - i. 3 cycles: 0.75" left, back to zero, 0.75" right, back to zero (one complete cycle)
 - ii. There shall be no failure or gross permanent distortion of anchors, frame, glass, or panels. Glazing gaskets may not disengage and weather seals may not fail.
- C. Thermal Cycling:
 - a. There shall be no air and water infiltration exceeding primary performance requirements, buckling, stress on glass, edge seal failure, excess stress on structure, anchors and fasteners, or reduction in performance when tested in accordance with AAMA 501.5 at a temperature range of 0 °F to 180 °F. Interior ambient air temperature at 70°F (+/- 5 °F) for hot and cold cycles.
- D. 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.
 - a. 1" glazing: STC [32], OITC [26] < 1/4" glass, 1/2" air space, 1/4" glass >
 - 2. Test results using glass-only values are not acceptable.
- E. Thermal Transmittance and Condensation Resistance Performance Requirements
 - 1. Thermal transmittance (U-factor) for window system shall not exceed [] BTU/hr-ft²-°F per NFRC 100. *(Coordinate performance with 08 80 00 Glazing)*
 - a. U-Factor performance reference data per NFRC 100 thermal simulations:

200 SYSTEM U-FACTOR (BTU/hr-ft ² -°F)				
CENTER OF GLASS U-FACTOR (BTU/hr-ft ² -°F)	Captured aluminum spacer	Captured warm edge spacer	SSG Verticals aluminum spacer	SSG Verticals warm edge spacer
0.30	0.46	0.44	0.41	0.37
0.29	0.45	0.43	0.40	0.37
0.28	0.44	0.42	0.39	0.36
0.26	0.43	0.40	0.37	0.34
0.24	0.41	0.39	0.35	0.32
0.22	0.38	0.36	0.33	0.29
0.20	0.37	0.35	0.31	0.28
0.18	0.35	0.33	0.30	0.26

NOTE: The above table for reference only. Please contact a Tubelite representative for system U-Factors using project specific glass and framing. Values based on 6 1/2" standard system and determined in accordance with NFRC 100 for a glazed wall configuration. Glass makeup: 1" IGU with ¼" ext, ½" space, ¼" int.

- 2. Solar Heat Gain Coefficient (SHGC) for the window area shall not exceed [] as determined in accordance with NFRC 200. *(Coordinate performance with 08 80 00 Glazing)*

3. Condensation Resistance Factor (CRF) shall meet or exceed []CRF_{frame} and []CRF_{glass} as determined in accordance with AAMA 1503.
 - a. CRF performance data:

CONDENSATION RESISTANCE FACTOR (CRF)		
SYSTEM	FRAME	GLASS
200 Series Captured	68	68

NOTE: The formation of condensation on interior surfaces is affected by many different variables outside of Tubelite’s control. Variables include but are not limited to: surrounding conditions, air flow / air circulation issues, extreme weather, HVAC settings, and unusual humidity levels. Tubelite cannot guarantee performance of system as stated above unless conditions are identical to those present in the testing procedure specified above.

1.04 SUBMITTALS

- A. 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.
- B. 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.
- C. Design Data: Submit framing member structural and physical characteristics, [engineering calculations], and [dimensional limitations].
- D. 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.
- E. Warranty: Submit manufacturer sample warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- F. 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.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least twenty years of documented experience.
- B. 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.
- C. Installer: Company approved by manufacturer and specializing in performing work of this section with at least [] years of [documented] installation experience.
- D. Source Limitations: Obtain the curtainwall and all products listed in Section 1.02 from a single manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Materials to be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.
- B. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

- A. 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.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before fabrication of curtainwall framing and indicate measurements on Shop Drawings.
- C. Install sealant according to sealant manufacturer guidelines.
- D. Coordinate installation with other applicable trades.

1.08 WARRANTY

- A. Aluminum Curtainwall Framing Warranty:
 - 1. Manufacturer agrees to repair or replace defective curtainwall components for a period of 2 [3][5][10] years from the date of shipment. *<3, 5, and 10 years optional>*.
- B. 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.
 - a. Paint Coatings
 - i. AAMA 2605 70% PVDF: 10 [20] years *<20 years optional>*
 - ii. AAMA 2604 50% PVDF: 5 [10] years *<10 years optional>*
 - iii. AAMA 2603 Baked Enamel: 1 year (adhesion only)
 - b. Anodized Coatings
 - i. AAMA 611 Class I: 5 [10] years *<10 years optional>*
 - ii. 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

2.01 MANUFACTURER

- A. Basis of Design: Aluminum Framed Curtainwall
 - 2. Tubelite Inc. 200 Series Curtainwall: 2" x [6", 6-1/2", 8", other] *<select>*
 - 1. Substitutions
 - a. 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.
 - i. Submittal information must include test reports as specified in performance sections.
 - ii. Copy of manufacturer's warranty
 - iii. Any additional information as requested
 - iv. System details / samples

2.02 ALUMINUM FRAMED CURTAINWALL

- A. Aluminum Framed Curtainwall: Factory or field fabricated, field glazed, factory finished aluminum, screw spline construction with infill and related flashings, anchorage and attachment devices.
 - 1. System dimensions:
 - a. Exterior face dimension: 2"
 - b. Back mullions depth: [4"] [4-1/2"] [6"] [other] *<select>*
 - 2. Glazing:
 - a. Position: face of glass setback from exterior 7/8 with 3/4" deep cover *<select>*

- b. Thickness: 1" [1/8" to 1"] <select>
- c. Method:
 - i. captured [structurally glazed] <select>
 - ii. outside glazed
- 3. Thermal barrier: 1/8" EPDM stem separator (thermally improved)

2.03 FINISHES

- A. Finish all exposed areas of aluminum curtainwall 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], [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

- A. 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.
- B. Applicator Qualifications: Certified by AAMA and listed on AAMA Verified Components List.
- C. Verify accuracy of components, quantities, and sizes prior to application of finishes.
- D. Applicator – PVDF Based Finishes:
 - a. Use regenerative thermal oxidizer to destroy VOC's.
 - b. 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.
 - c. Possess in-house blending capabilities, allow for only specific amount of paint needed for each project.
 - d. Utilize automated rotary atomization spray bell application providing uniform coverage with manual spray reinforcement for coverage in areas unreachable by automation.
 - e. Employ skilled professional field service division to repair warranty or application issues arising at Project site.
 - f. Utilize documented quality control protocol in accordance with AAMA procedures.
- E. Applicator – Anodize Finishes
 - a. Offer both standard eco-friendly (acid) and optional caustic (traditional) etching technologies
 - b. Utilize fully automated, computer-controlled process lines for consistency through Project.
 - c. Utilize documented quality control protocol in accordance with AAMA 611 procedures.
 - i. Online quality assurance inspection:
 - 1. Random sample check for color uniformity, maximum difference of 5AE.
 - 2. Random coating thickness testing:
 - a. Class I clear and color anodize – 0.7 mils (18 microns)
 - b. Class II clear anodize – 0.4 mils (10 microns)

2.04 MATERIALS

- A. 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>
 - a. Provide EcoLuminum™ by Tubelite containing 70% recycled aluminum comprised of 55% pre-consumer and 15% post-consumer material.
- B. Primary extruded framing members will be a minimum 0.125" thick.

- C. Extruded or formed trim components will be a minimum 0.060" thick.
- D. Exposed Flashings: [] thick aluminum sheet; finish matching framing members.
- E. Concealed Flashings: [] thick [galvanized steel] [stainless steel] or [aluminum] sheet. <select>
- F. Structural Steel Reinforcement and anchors necessary to meet the performance requirements of 1.04.
 - 1. ASTM A36/A36M; [galvanized per ASTM A123/A123M] or [shop primed]. <select>
 - 2. 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.
- G. 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.
- H. Bituminous Paint: Cold applied asphalt mastic, containing no asbestos fibers.
- I. Glazing and Sealant material:
 - 1. Setting blocks and Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
 - 2. Glazing gaskets shall be EPDM [silicone], weather-resistant, and compatible with all materials in contact.
 - 3. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
 - 4. Frame joinery sealants shall be suitable for application specified and as tested and approved by the window wall manufacturer.

2.05 FABRICATION

- A. 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.
- B. Expansion and Contraction: Fabricate to allow for thermal movement of materials when subjected to project temperature differential requirements.
- C. System Internal Drainage: Drain to exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 1. Fabricate drainage system so weeps and flashings are integral to system and others are not required.
- D. Allow for movement between curtainwall and adjacent construction, without damage to components or deterioration of seals.
- E. Provide for membrane interface as indicated on architectural drawings.

2.06 COMPONENTS

- A. Glass
 - 1. Provide in accordance with Section 08 80 00.
- B. 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.
- C. Operable Windows: Provide operable windows at locations indicated on the architectural drawings.
 - 1. Basis of design: Tubelite 3700 Series Windows
 - a. [3700 Awning] [3700 Casement] [3700 Concealed] <select>
 - b. Basis of design: Tubelite Phantom 5000 Zero Sightline Windows
 - i. [Awning] [Casement] <select>
- D. Light Shelves: Provide interior light shelves at locations indicated on the architectural drawings.
 - 1. Basis of design: "aLuminate™ Light Shelves" by Tubelite, Inc.
 - 2. Refer to Section 12 26 00 for requirements.
- E. Sun Shades: Provide sun shades to help reduce natural daylight and solar heat gain.
 - 1. Basis of design: "Maxblock™ Sun Shades" by Tubelite, Inc.
 - 2. Blade: [round] [airfoil] [z-blade] <select>
 - 3. Outrigger projection: [20"] [25"] [30"] [35"] [other] <select – contact a Tubelite representation for other options>
 - 4. Refer to Section 10 71 13 for requirements.
- F. Muntins:
 - 1. Provide muntin grids as shown on architectural drawings. Finish to match curtainwall frames.

PART 3 – EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of this Work.
- B. Notify Contractor in writing, with a copy sent to Owner and Architect, of any conditions detrimental to proper and timely completion of this Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Start of this Work shall indicate acceptance of areas and conditions as satisfactory by the Installer.

3.02 INSTALLATION

- A. Preparation: Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, and other accessories to be embedded in concrete or masonry construction or welded to structural steel. Coordinate delivery of these items to project site.
- B. Install aluminum curtainwall 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).
- C. Do not install damaged components.
- D. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- E. Provide alignment attachments and shims to permanently fasten system to building structure.
- F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, [aligning with adjacent work].
- G. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- H. Coordinate attachment and seal of membrane materials per architectural drawings. Refer to section 07 25 00.
- I. Install accessories with positive anchorage to building, weather tight mounting, provisions for thermal expansion, and coordinate installation with flashings and other components.
- J. Install hardware using templates provided. Refer to Section 08 71 00 for hardware installation requirements.
- K. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- L. Install perimeter sealant in accordance with Section 07 92 00.
- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- N. Adjust operating hardware for smooth operation.
- O. 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"].

3.03 CLEANING

- A. Comply with AAMA 609 and 610 for methods, equipment, and materials to clean finished aluminum after installation and for subsequent periodic maintenance.
- B. 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.
- C. Remove excess sealant from glass and aluminum by method acceptable to sealant and finish manufacturer.

3.04 PROTECTION

- A. Protect installed products from damage during subsequent construction.
- B. 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. Tubelite takes no responsibility for product selection or application, including but limited to, compliance with laws, codes, merchantability or fitness for a particular purpose; and further disclaims all liability for the use in whole or in part, of these Guide Specifications in preparation of project specifications or other documents.

END OF SECTION 08 44 13

This document supersedes all previous versions.