CURTAIN WALL GUIDE
SPECIFICATION (2/16/10)

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1. GENERAL

1.01 SYSTEM DESCRIPTION

A. Approved System: TW Green Curtain Wall or other pre-approved open joint system fulfilling the performance parameters.

B. The system shall be designed with totally pressure equalized joint cavities with clear separation between water seal and air seal and with instantaneous water drainage system such that there would be no critical seal in the system.

C. The system shall be designed to replace any damaged vision glass from the interior side.

D. The system shall be designed with independent panel frame around each piece of facing material and pre-glazed in the shop to form a facing unit. The system shall also be designed with the ability to remove and replace a facing unit without removing the adjacent facing units or the supporting structure.

E. Provide movable joints to accommodate the full range of thermal and seismic movements, manufacturing and erection tolerances, floor sag, beam sag, column settlement, inter-floor deflection, and inter-story drift.

F. Provide structural support for exterior fixtures such as decorative fins, sunshades, etc. without penetration of the wall sealing surface and without affecting the ability to tolerate the structural movements of the building frames.

1.02 PERFORMANCE AND TESTING REQUIREMENTS

A. The following construction tolerances, structural and weather resistance performance requirements shall be met or exceeded in the as-built work. Conformance shall be demonstrated by calculations and testing of mock-ups.

B. Construction Tolerances

1. The mullion connection system shall be designed for the following three directional tolerance adjustments without field welding and without impairing the structural integrity of the connection system.
   a. Construction Tolerance in In-and-Out Direction = ± 1.0”
   b. Construction Tolerance in Up-and-Down Direction = ± 1.5”
   c. Construction Tolerance in Left-to-Right Direction = ± 1.5”
C. Structural Performance Parameters

1. All components of the system shall be designed to resist the following wind load conditions without exceeding the allowable stresses per 2000 Aluminum Design Manual.

   a. Design loads and pressures for the work shall be minimum ________ inward ________ negative.

   b. Corner areas consisting of “A” side and “B” side shall be, at a minimum, analyzed under the following wind load condition:

      Outside Corner
      (1). 100% positive load on “A” side and 100% negative load on “B” side.
      (2). 100% negative load on both “A” and “B” sides.
      (3). 70.7% of positive load on both “A” and “B” sides.

      Inside Corner
      (1).70.7% negative load on both “A” and “B” sides.
      (2). 70.7% positive load on both “A” and “B” sides.

2. Tolerance To Inter-floor Story Drift

   The system shall be designed to tolerate an inter-story drift of L/100 (where L = story height) without any functional failure and an inter-story drift of L/40 without structural failure (defined as falling off of any system component).

3. Tolerance To Inter-floor Deflection

   The horizontal curtain wall joint shall be designed for a maximum movement of ¼” while tolerating an inter-floor deflection of up to ¾” (19 mm).

4. Deflection Limitations

   a. The deflection of any framing member in a direction normal to the plane of the wall when subjected to the specified design pressures and loads shall not:
(1) Exceeds 1/175 of its clear span. For cantilevers, the span shall be taken as 2.0 times the distance between anchor centerline and end of cantilever.

(2) Exceed 1/240 of its clear span or 19mm for skylights.

b. At connection points of framing members to anchors, combined movement of anchor relative to building structure and framing member relative to anchor, shall not exceed 1/16” (1.6mm) in any direction, nor 1/16” (1.6mm) residual deflection after load is removed.

c. Upon reversal of load direction at magnitudes up to and including 1.5 times design pressures, slippage at fastened and/or clamped connections shall not exceed 1/8” (3.2mm)

d. Glass deflection at half design load shall not exceed 1/90 of its span or ¾” (20mm), whichever is less. Glass deflection at full design load shall not exceed 1-3/16” (30mm). The span shall be taken as the lesser of the distances between the horizontal or the vertical support members.

e. Metal panel deflection shall not exceed 1/60 of its span or 1-9/16” (40mm), whichever is less. The span shall be taken as the lesser of the distances between the horizontal or the vertical support members.


a. The work shall be designed to withstand the design loads and pressures specified herein. Compliance shall be demonstrated by calculations performed in accordance with accepted engineering practice.

b. Uniform load structural tests of the work shall be conducted in accordance with ASTM E 330 or ASTM E 72. Inward and outward acting test pressures shall be equal to 1.5 times the inward and outward acting design wind pressures. Satisfactory performance at these loads shall mean no glass breakage; no permanent damage to fasteners or anchors, hardware parts or actuating mechanisms; no malfunctioning of windows, doors, and operating hardware; no permanent deformation of main framing members in excess of 0.2% of their clear span.

c. Where permitted by code, a 33% increase in allowable stress is generally acceptable when produced by wind or seismic loading, acting alone or in combination with design dead and live loads, provided that stresses are not calculated on the basis of reduction factors applied to design loads in combinations. The required section computed on this basis
shall not be less than that required for the design dead and live load, computed without the 33% increase. In no instance, shall the yield strength of the material be exceeded. Allowable stress shall not be increased by 33%, or any other factor, for expansion bolts, concrete insert or other connections to concrete, and stress resulting from dead loads.

d. The allowable compressive stress used in the design of flexural members shall account for the un-braced length of the compression flange. Glass, sealant, and interior finishes shall not be assumed to contribute to lateral stability of the framing members, Points of contra-flexure shall not be considered as lateral braces or as the end points of an un-braced length.

e. Insert or cast in anchors must be designed with a minimum safety factor of 3.0 for all combined loads.

D. Tolerance To Thermal Movement

1. The work shall be designed to provide for such expansion and contraction of component materials, as will be caused by an exterior surface temperatures ranging from _______ to _______, without causing buckling, stresses on glass, metal, or joint seals, undue stress on structural element, damaging loads on fasteners, reduction of performance or other detrimental effects.

2. The amount of such movement that is accommodated in the subcontractor’s design shall be identified on subcontractor’s submittal drawings, and shall be accompanied by thermal calculations.

D. Air Leakage

Air infiltration test shall conform to ASTM E283. Differential static test pressure shall be positive 1.6 psf (75 Pa). Chamber leakage shall be accurately determined, not estimated. Air leakage of test specimen fixed wall area shall not exceed 0.06 cfm/ft² (0.0182 M³/Min/M²) of exterior surface, exclusive of any operable window and door areas. Air leakage of operable windows or doors shall not exceed 0.25 cfm/ft (0.0232M³/Min/M) of crack length.

F. Water Penetration.

1. Water penetration, in this specification, is defined as the appearance of uncontrolled water other than condensation on the indoor face of any part of the work. “Controlled” water or condensation is that which is demonstrably drained harmlessly to the exterior of the work without
endangering or wetting adjacent surfaces of insulation, and not visible in the final construction.

2. No uncontrolled water penetration shall occur when the work is tested in accordance with AAMA 501.1. The equivalent differential air pressure used in the test shall be 15 psf (720 Pa). This water test shall be conducted after 50 cycles of inter-floor deflection, 50 cycles of inter-floor story drift, 50 cycles of positive and negative wind loads, and conducted at the condition of maximum inter-floor deflection.

G. Light Transmission.
The glazed areas of the work shall meet the following requirements:

1. For vision area: (See glass section for detail description sections.)
   Light Transmittance, average daylight: Architect makes decision.
   U value: (summer) Architect makes decision.

**Example Glass Specification:**

- 1” thick compromising of ¼” Pyrolytic Reflective Eclipse Advantage (Blue or BlueGreen, as might be required) Fully Tempered (Coating on surface #2) + ½” Air Space + ¼” thick Pyrolytic Energy Advantage Clear Low-E Tempered (Coating on surface #3) or equivalent approved with the following attributes:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Arctic Blue</th>
<th>BlueGreen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible Light Transmittance (%)</td>
<td>34</td>
<td>47</td>
</tr>
<tr>
<td>Visible Light Reflectance – Out (%)</td>
<td>13</td>
<td>21</td>
</tr>
<tr>
<td>Visible Light Reflectance – In (%)</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Solar Energy Transmittance (%)</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Solar Energy Reflectance (%)</td>
<td>8</td>
<td>12</td>
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<tr>
<td>U – Value:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer (BTU/hr/Sq.ft/f)</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>Winter (BTU/hr/Sq.ft/f)</td>
<td>0.31</td>
<td>0.31</td>
</tr>
<tr>
<td>Solar Heat Gain Coefficient</td>
<td>0.28</td>
<td>0.36</td>
</tr>
<tr>
<td>Shading Coefficient</td>
<td>0.32</td>
<td>0.41</td>
</tr>
<tr>
<td>Relative Heat Gain (BTU/hr/Sq.ft.)</td>
<td>68.20</td>
<td>86.20</td>
</tr>
</tbody>
</table>

- All vision glass should be double glazed.
- Spandrel glass can be single glass provided that color is matching with double glass.

H. Fire Resistance Requirements
   1. Performance of panels under fire or high temperature exposure shall be in accordance with the procedures listed below:
      - Non-combustibility - ASTM E136
      - Flame-spread - ASTM E84
      - Fire Resistive Rating - ASTM E119 or a modified ASTM E119 procedure

      The spandrel panel including shadow box areas must be designed and anchored in a manner that it will stay in place and prevent passage of smoke, flame, and hot gases for the requisite fire exposure period when exposed to the ASTM E119 time temperature curve.

   2. Fire stops and saving insulation shall be provided between the interior wall surface and the building structure as shown on the Architect’s drawings.

I. Field Test for Water Leakage

Field Water Test shall be performed in accordance with AAMA 501.2 Standard on a selected area approved by the Owner. The owner or Architect will determine the necessity and scope of additional tests, depending upon the presence or absence of leakage in the initial tests. The subcontractor shall perform at least one successful test per wall type, plus any unsuccessful tests, at no additional cost to the Owner. Any corrective work required shall be the responsibility of the contractor, along with the cost of retesting, and the costs incurred by the Owner and Architect. Remedial measures shall maintain standards of quality and durability and are subject to the Owner’s approval (Tests to be performed at early phase as possible.)

1.03 SUBMITTAL

A. Proposal Drawings.
   With his bid, the subcontractor shall submit proposal drawings that show how he will address typical conditions for each type of work, typical curtain wall for each wall type, metal panel, store front, and louvers, the proposal drawings shall include typical partial elevations (with anchor locations), sections (drawn
full size), and anchorages (showing connections to structure). The proposal shall include structural calculations to substantiate the design. Proposal drawings are to show all adjacent construction and provisions for all items as noted in section 1.03.

B. Shop Drawings

1. Prior to submission of job drawings submit complete mock-up drawings, including layout of test chamber steel showing simulated floor slab construction, beam connections and construction for seismic test movements. Seismic movement shall occur at intermediate floor level.

2. Prior to starting construction of mock-up and project materials respectively, the subcontractor shall submit complete shop drawings depicting all materials and work being furnished under his work. All shop drawings and submittals are to be subject to Owner’s and Architect’s approval.

3. Shop drawings shall include:
   a. A cover sheet contains an index of drawings.
   b. Plan layouts, showing insert and embed locations in relation to cladding and mullion centerline, and building column lines.
   c. A complete index of the material (alloy, temper, thickness, finish, coating, size, hardness, trade name, product name, etc.)
   d. Floor plan layout for each of the floors, showing all relevant geometric information, cladding layout and building column lines.
   e. Complete wall elevations and building sections at scale (1:200), showing all relevant geometric information.
   f. Typical unit or area elevations at scale (1:20) both exterior and interior.
   g. The full size details are including every member, joint, connection, anchorage, joinery details with internal seals, welds, glazing details with glass and metal sizes and relationships, and sealant applications.
   h. Work point of curtain wall, and cross-referenced.
   i. Glass face in relation to curtain wall.
   j. Provide joinery detail of all rail intersection and aluminum connection, show all seal at intersection. Show all section thickness, frame lap over glass and edge clearance.
   k. All drawings should be tied together.
   l. All drawings are to show adjacent work structure and required coordination.
   m. All revisions will be noted on the drawings. The revised areas shall be bubbled and the revision version indicated.
C. Calculations

All drawing submissions shall include structural calculations for the work included in the drawing submission. The calculations shall include:

1. Calculations are to be done in accordance with common, accepted engineering practice and shall conform to appropriate design rules of the reference documents and local codes, and building ordinances. All documents are to bear the signature and seal of a registered structural engineer employed by Subcontractor and approved by Architect and Consultant.

2. Material specifications and properties.

3. The derivation of member properties.

4. Analyses of stress and deflections for all structural elements, connections and anchorages.

1.04 MOCK-UPS

A. The laboratory where the mock-ups will be held will be determined by the Curtain Wall Contractor and the Owner. Other laboratories may be acceptable and are subject to approval if requested in writing prior to Curtain Wall Contractor’s bid proposal. Erection of mock-up shall not commence prior to laboratory approval.

B. The base fee for the testing laboratory for mock-up is the responsibility of the Curtain Wall Contractor. Any additional fees, penalties, retest costs, etc., for mock-up is the sole responsibility of the Curtain Wall Contractor.

C. In the event that failures on mock-up necessitate retests, the Curtain Wall Contractor shall pay the additional laboratory fees and any other fees and expenses, including Owner’s, Architect’s, and Consultant’s fees and expense incurred by the Owner as a result of retesting. All necessary corrections shall take place in the presence of the Owner, Architect and Consultants.

D. The Curtain Wall Contractor shall furnish all labor and materials to build and test mock-up, as shown on drawings. Mock-ups shall accurately represent job conditions, including glass, glazing, joints, sealants, anchors, and finishes. Mock-ups are subject to observation by the Owner, Architect and their Consultants during fabrication, construction and testing and are subject to aesthetic review. For coordination, the contractor shall provide a detailed schedule including mock-up fabrication, erection, glazing, sealing and testing thirty (30) days after notice to proceed.

E. Mock-up shall be fabricated at the same locations and by the same personnel who will execute this work for the project. Mock-up Installation shall be performed by the same personnel who will execute this work on site.
F. Mock-up drawings shall include plans, elevations, sections, chamber steel layout showing simulated building conditions. Indicate support and diagram showing proposed movements of intermediate floor construction for seismic testing. All simulated structural supports for mock-up are to be designed, drawn, and furnished by the Curtain Wall Contractor.

G. Mock-up shall be constructed in strict accordance with approved shop drawings and all methods of mock-up joint assembly are to faithful represent actual job conditions. No special measures or techniques may be used that are not representative of those to be used on the building. Any changes or deviations from the drawing shall be subject to approval and, if approved, incorporated into “as-built” drawings. The as-built drawings are to be provided to the Architect and Owner immediately upon completion of the testing.

H. Preliminary and unofficial tests are not permitted. All test results and remedial work shall be documented in the laboratory report, and submitted to Owner and Architect.

I. Contractor shall coordinate chamber availability, shipping schedules, and mock-up construction schedules direct with the approved testing laboratory.

J. Contractor shall provide extra materials for mock-up construction in case of damage during shipping or erection.

K. Laboratory tests on full-scale mock-ups.
   1. Testing sequence shall be:
      a. Open and close all operable windows if any 25 times.
      b. Pre-load at 50 percent of inward design pressure.
      c. Air infiltration by static method, including chamber calibration.
      d. 50 cycles of structural test at 100 percent of inward and outward design wind pressure. The first cycle shall be conducted for three load stages at 50%, 75%, and 100% of design wind pressure with deflection measurements.
      e. 50 cycles of inter-floor story drift (Phase 1): $\pm L/100 \pm \_\_\_\_\ in. (\_\_\_\ mm).
      f. 50 cycles of inter-floor deflection (down \_\_\_\ in. (\_\_\_\ mm) and back to zero except the last cycle).
      g. Conduct Dynamic water infiltration test with equivalent dynamic pressure of 15 psf (AAMA 501.1) at the maximum floor deflection of \_\_\_\ in (\_\_\_\ mm).
      h. Structural test at 75 percent and 150 percent of inward design wind pressure without deflection measurement.
i. Structural test at 75 percent and 150 percent of outward design wind pressure without deflection measurement.

j. Lateral displacement test (Phase II) = + L/40 ± ___ in. (_mm) for three cycles.

2. Air infiltration test shall conform to ASTM E283. Differential static test pressure shall be positive 1.6 psf (75 Pa.). Chamber leakage shall be accurately determined, not estimated. Air leakage of test specimen fixed with area shall not exceed 0.06 cfm/ft² (0.0182 M³/Min/M²) of exterior surface, exclusive of any operating window and doors shall not exceed 0.25 cfm/ft (0.0232 M³/Min/M) of crack length. Fixed panels are included in fixed wall area, and are not to be included in operator crack perimeter. For dual windows, only the primary window is considered for determination of fixed area or operator crack perimeter.

3. The occurrence of condensation during water infiltration tests is acceptable. The accumulation of water in door sill tracks is acceptable; overflow, percolation or leakage of water from sill tracks is not acceptable. Other water leakage is acceptable only if all of the following conditions are satisfied:
   a. The water is contained and drained to the exterior.
   b. There is no wetting of a surface that would be visible to building occupants.
   c. There would be no staining or other damage to any part of the completed building or its furnishings. This definition of water leakage shall govern over other definitions which may appear in referenced documents. The source of all water leakage during testing shall be identified.

4. Where the test sequence or test failure requires successive water infiltration tests, the only means used to drain water from internal cavities shall be gravity drainage through the weep system for a minimum of 15 minutes. Air pressure, removal of parts or other means of draining water shall not be used. All weep tubes to be clear plastic if any.

5. Dynamic water infiltration test shall conform to AAMA 501.1 except as otherwise specified herein. Differential test pressure shall be 15 psf (720Pa). There shall be no unacceptable water leakage as defined herein.

6. Structural tests shall conform to ASTM E330 or ASTM E 72 for isolated component. Deflection gauges shall be set to zero prior to each application of pressure at 50, 75, 100 percent of design wind pressures. Deflection gage readings shall be recorded after each application of pressure. Deflection measurements are not required for the initial preload.

7. Inter-floor story drift.
   a. The mock-up test chamber shall be constructed so that the simulated floor structure at approximate mid-height of the
mock-up is moveable in a horizontal and vertical sense parallel to the glass plane(s).
b. Phase I: Displace moveable structure first in one direction, then in the other direction. Repeat for a total of 50 cycles.
c. Phase II: Repeat phase I procedure using phase II displacement for three cycles.
d. For phase I there shall be no failure or gross permanent distortion of anchors, frames, glass or panels, no gasket disengagement and no weather or structural sealant failures. Phase II allows system failure, however, no curtain wall component is allowed to fall off the mock-up.

L. Waiver of laboratory mock-up test: The Architect and/or the Owner may waive the requirement of laboratory mock-up test based on the evidence of extensive prior mock-up tests on the proposed system.

1.05 FIELD MEASUREMENTS

Verify that field measurements are as indicated on shop drawings. Subcontractor is responsible for verifying all dimensions in field and for providing time satisfaction of any field conditions that are the work of others which may inhibit the installation of the work of this contract.

1.06 COORDINATION

The work under this section shall be coordinated with related work of other trades, utility companies, etc., in a manner to ensure the steady progress of work under this contract.

1.07 WARRANTY

A. Unless stated otherwise in these specifications, the guarantee shall state that all work is in accordance with the drawings and specifications, free from defects in materials, finish, and workmanship, and weather-tight for a period of five (5) years from the date of acceptance of the work by the Owner. Subcontractor shall agree to repair or replace defective materials and workmanship to “like new condition”, including such exploratory work as necessary to determine the cause, during the guarantee period, at no additional cost to the Owner. All warranties to cover costs of “in place” replacement, not just delivery of defective materials to site.

B. The guarantee shall further state that glass shall be guaranteed against breakage due to defects in glass materials, fabrication of insulating units, and installation for a period of five (5) years after acceptance of the work by the
Owner. The contractor shall include with his bid a copy of the proposed warranty.

C. Insulating glass units shall carry a five (5) year warranty from their manufacturer against delamination, obstruction of vision by fogging up and collection of dust or dirt in the enclosed space or cracking, peeling of flaking of coating and/or opacifiers as applicable and in a form acceptable to the Owner. Subcontractor shall include with his bid proposed copy of warranty from proposed glass manufacturer for each type of unit.

D. Defective materials and workmanship for these guarantee provisions is hereby defined to include, but not be limited to evidence of:

1. Penetration of water into the building.
2. Air infiltration exceeding specified limits.
3. Structural failure of components resulting from forces within specified limits.
4. Delamination of panels or insulating glass units.
5. Discoloration, excessive fading, excessive non-uniformity, pitting, cracking, crazing, peeling, or corrosion.
7. Secondary glass damage and/or damage due to falling curtain wall components.
8. Adhesive or cohesive failure of sealant. Staining caused by sealant.
9. Crazing on surface of non-structural sealant.
10. Failure to fulfill other specified performance requirements. Failure of operating parts to function normally/properly.
11. Insulated glass which experience failure of the edge seal as defined herein shall be replaced at no charge (material and labor) for a minimum five (5) year period beginning on the date of final acceptance.
12. A reflective glass product whose reflective coating cracks, peels or discolors shall be replaced at no charge (material and labor) for a minimum five (5) year period beginning on the date of final acceptance.
13. A painted finish on aluminum which cracks, peels, fades in excess of specified limits or chalks in excess of specified limits shall be replaced at no charge (material and labor) for a minimum five (5) year period beginning on the date of final acceptance.
14. Failure of operating parts to function normally.
15. Cracking, crazing, flaking of coated glass.

2. PRODUCTS

2.01 FABRICATION

A. General
All parts of the work shall be of the materials, design, sizes and thickness herein specified or as may be required to meet the aesthetic intent and
performance criteria. Methods of fabrication and assembly, however, unless otherwise specifically stated, shall be at the discretion of the contractor and subject to acceptance by the Owner, Architect, or Consultant with submitted drawings prior to any fabrication.

B. Workmanship
All work shall be done by competent workmen thoroughly skilled in the trade. Use no materials, equipment or practices that may adversely affect the functioning, appearance and durability of the completed work and related construction. The work shall be accomplished in compliance with the specified criteria without buckling, opening of joints, undue stress on fasteners, sealants, and gaskets, opening of welds, cracking of glass, leakage, noises or other harmful effects.

C. Joints in Metal Work
1. All exposed work shall be carefully matched to produce continuity of line and design and all joints, unless otherwise shown or specified, shall be accurately fitted and rigidly secured. Joinery intended to be “in plane” shall not vary from true alignment by more than 1/32” (0.80mm). Offset in glazing rabbet shall not be greater than 1/32” (0.80mm).
2. All joint intersections to be buttered with sealant prior to assembly, then fillet sealed on non-exposed areas or application of sealant tape of NORSEAL V710 and seal all screw penetration heads for screws penetrating into the interior air space.

D. Shop Assembly.
As far as practicable, all fitting and assembly work shall be done in the shop.

E. Exposed Fasteners.
Exposed fasteners on finished surfaces will not be permitted unless otherwise shown on the approved drawings, or specified.

F. Protection of metals.
Protection against galvanic action shall be provided wherever dissimilar metals are in contact, except in the case of aluminum in contact with stainless steel. This protection shall be provided by either painting the contact surfaces with two heavy coats of zinc rich primer (in different colors) or by application of an appropriate sealant or tape or other approved galvanic isolator. All metals, except stainless steel, which are to be in contact with concrete, mortar or player, shall have the contact surfaces protected with zinc rich primer, two coats of different colors bituminous paint or aluminum metal-and-masonry paint.

G. Welding
All welding shall be done in accordance with pertinent recommendations of the American Welding Society and approved by the Owner and shall be done with electrodes and methods recommended by the suppliers of the metals being welded. Type, size and spacing of welds shall be shown on the approved shop drawings. Welds behind finished surfaces shall be done in such manner as to not cause distortion “weld telegraphing” or discoloration on the finished side. Weld spatter and welding oxides on finished surfaces will
not be permitted. Welding on exposed surfaces is prohibited. All steel-to-
steel welds shall be wire brushed to remove scale and painted with two (2)
coats of zinc rich primer in differing colors.
Fillet welds are not permitted as a means of attaching stud type members (i.e.,
headed studs, deformed bars, threaded rods) to insert plates. Only full
penetration welds to the end of studs are acceptable. These welds must be
made with a machine specifically designed to weld studs to insert plates.

H. Shop painting of carbon steel.
Items of carbon steel, unless galvanized after fabrication or scheduled for
other finish shall, after completion of fabrication and welding, be thoroughly
cleaned of all loose scale, fillings, dirt and other foreign matter and shall be
painted with two coats of zinc rich primer in two different colors.

I. Use of Sealing Materials
All uses of sealing materials shall be in strict accord with recommendations of
the manufacturer of the material.

3. EXECUTION

3.01 EXAMINATION
A. After lines and grades have been established, (Main Contractor will provide
basic control lines and one bench mark on each floor.) and before beginning
installation in any area, the subcontractor shall examine all parts of the
structure on which the work is to be placed in that area. Should any
conditions be found which, in his opinion, will prevent the proper execution of
his work, he shall report such conditions in writing to the Main Contractor.
Installation work shall not proceed in that area until an agreement is reached
on how the work will be adjusted to the satisfaction of the Main Contractor
and Architect.
B. Coordinate work with that of other trades. Report any errors, omissions or
inconsistencies by other trades and request direction before proceeding.
Promptly furnish items to be placed during the installation of other work.

3.02 INSTALLATION
A. Postponement of Complete Enclosure
If so directed by the jobsite supervisor, installation of the work shall be
postponed in any area, so as to facilitate moving material into and out of the
building during construction.
B. Qualification of Workmen
All work shall be performed by skilled workmen, especially trained and
experienced in this type of work.
C. Lines and Grades.
Bench marks will be established on each floor by the Main Contractor. But
building line offset marks for alignment on each floor has to be established by
this subcontractor. Should any error be found, the subcontractor shall notify
the Main Contractor/Architect in writing, and installation work shall not
proceed in the affected areas until the errors have been corrected. The subcontractor must provide a layout team throughout installation.

D. Welding
All welding shall be done by skilled mechanics, certified, qualified or insured in accord with local building regulations, and shall conform to the recommended practices of the American Welding Society and approved shop drawing requirements. Welds and adjoining burned areas shall be thoroughly cleaned and painted with two coats of primer as specified herein. Special care shall be taken to protect glass and other finished surfaces from damage and to prevent causing fires.

E. Use of Sealing Materials
Sealing materials specified in this section shall be used in strict accordance with the manufacturer’s printed instructions and shall be applied only by mechanics specially trained or experienced in their use. Before applying sealing materials, all mortar, dirt, dust, moisture and other foreign matter shall completely be removed from surfaces the sealant will contact. Adjoining surfaces shall be masked, when required, to maintain a clean and neat appearance. Sealing compounds shall be tooled to fill the joint and to provide a smooth finish surface. The manufacture of each type of sealant shall be requested to render technical assistance to provide application of a smooth finish surface. The manufacturer of each type of sealant shall be requested to render technical assistance prior to the application of a sealant, witness the first shop and job site applications, and also conduct periodic inspections as required. The subcontractor shall witness and document inspections performed by the sealant manufacturer and provide close supervision of all labor used to apply sealants.

F. Anchorage
1. Anchorage of the work to the structure shall be done by approved methods in strict accordance with approved shop and/or erection drawings. Supporting brackets shall be so designed as to provide three dimensional adjustment and accurate location of all components without field welding. If field welding is required, all components so designed on approved shop drawings shall be rigidly fixed by welding prior to the positioning of any curtain wall component.
2. Provide a separator at contact surface of dissimilar materials wherever there is a possibility of corrosive or electrolytic action.
3. Remove weld slag and apply prime paint over welds. Also paint that is damaged by welding or other causes.
4. Where slots or oversize holes are provided for adjustment only, secure the connection after final adjustment. Interlocking serration in extruded aluminum brackets and washers are acceptable. Steel weld washers with 0.25 inch minimum thickness are acceptable with steel brackets. Special washers or nuts which rely on friction and/or surface indentation of the fastened part are not acceptable.
G. Insulation/Fire Saving Installation

Install firestop and saving insulation in locations shown on drawings. Generally, this shall occur in space between floor edge and wall panels at depth required to achieve continuity of fire separation between floors.

Compress saving insulation to fill the entire void. Saving clamps may be used where size of opening to be filled permits.

For larger areas, subcontractor shall supply and install support system to satisfy local government regulations which shall extend from edge of floor slab to aluminum air barrier panel. Thermal insulation shall be discontinued vertically at this location and replaced with saving insulation.

3.03 TOLERANCES

A. Workmanship

All parts of the work shall be erected, plumb and true, in proper alignment and relation to established lines and grades, and as shown on approved shop and/or erection drawings.

B. Erection Tolerances

1. The work shall be designed to accommodate the anticipated dead and live load movement, thermal movements, creep, sway and torsion of the structure without any harmful effects. All parts of the work, when completed, shall be within the following tolerances, and shall remain so during the life of the building except settlement due to concrete creep:

   a. Maximum variation from plane or location shown on approved shop drawings: 1/8” (3.2mm) per 144” (3660mm) of length, or 1/2” (12mm) in any total building length or portion thereof.

   b. Maximum offset from true alignment between two members abutting end-to-end, edge-to-edge in line or separated by less than 3” (75mm) and shall not exceed 1/16” (1.6mm) (shop and/or field joints). This limiting condition shall prevail under both no load and full load conditions.

   c. Maximum variation in the width of a joint between two adjacent panels or between a mullion and an adjacent panel shall be ± 1/8” (3.2mm).