

TG08.4 – Metal Panels

Questions are numbered in the order received. Numbers missing in the sequence either have been answered in a previous response set or will be answered in a future set.

Question No.	Submission Date	Drawing No.	Document/ Spec. No.	Question	Response
TG08.4-006	2/20/2015	07 42 13	07 42 13	<p>Specifications section 2.2.C indicate manufacturer of .125 alum plate. Centria and Dri Design do not manufacturer a product using .125 alum or SS. Tajima has been purchased by CRL Company, and uses Tajima name only for door group. This leaves one source for the W-16A and W-16B panels.</p> <p>Please provide additional acceptable manufacturers.</p> <p>Suggest Architect Systems, Inc. Monet, MO and CRL Company, Los Angeles, CA.</p>	W-16 is a Design Build system and Centria was the manufacturer used for the basis of design. The contractor may select any equal manufacturer or supplier whose product meets the design intent and performance requirements of specification 07 42 13.
TG08.4-008	2/20/2015		07 42 13 (2.7) A 07 42 13	<p>Specifications indicate 18 ga G-90 steel, and 20 ga aluminum back pans. Detail sheets reference indicates these two types and a third 1/8" aluminum.</p> <p>Is this component design build?</p> <p>If not please clarify back pan type for panel type.</p>	<p>Refer to response to TG08.4-013: TG08.4 is a Design Build package. The drawings describe the design intent, which include technical requirements indicated in the drawings for performance reasons. The Specifications detail the performance requirements and quality.</p> <p>Provide 18ga galvanized steel back pans per specification part 2.7.A. for all W-16A, W-16B and W-17/19 exterior metal stud wall assemblies.</p> <p>Provide 20ga aluminum back pans per specification part 2.8.B. for all W-16C fascia assemblies.</p>
TG08.4-009	2/20/2015		07 42 13 (3.4) G 07 42 13	<p>G- Item 5-Sealant type called out a green screen type sealant. I am not sure what this is?</p> <p>Please confirm sealant type at panel system W-16C and similar to be type A-07 92 00</p>	<p>Please disregard the reference to a green screen type sealant.</p> <p>Confirmed; the sealant for use at panel system W-16C shall be similar to type A in specification 07 92 00.</p>

TG08.4-010	2/20/2015		70 42 13 section 3.4 A 07 41 13	<p>Installation tolerances indicated in 3.4A are not measurable and are consistent with Curtain wall not metal panels. Section 3.7-I tolerances specified for clay panel is reasonable.</p> <p>Suggest revise section 3.4-A to match 3.7-I, or accept manufacturers published tolerances.</p>	Refer to enclosed markup of Specification Section 07 42 13. We have revised paragraph 3.4 A with tolerances to match AAMA Guide Specifications.
TG08.4-011	2/20/2015		07 42 13 Section 2.3-D- Performance 07 42 13	<p>Thermal performance indicated as U=.45. I assume architect means U=.45/R-22 4" of semi rigid insulation Roxul= R-16.</p> <p>Please clarify thermal requirements.</p>	Please disregard U value language and proceed with 4-inch thick semi-rigid mineral wool insulation in spandrel areas with a minimum thermal resistance of R-15.
TG08.4-012	2/20/2015		07 42 13	<p>Girth of metal panel Type W-16C as shown in section 2/A1-8610 exceeds mfg std, in one directions < / = 60". Current girth is 125" in one direction and 68" in another.</p> <p>Can we add horizontal or vertical panel joints as required?</p>	Girth of metal panel Type W-16C should work with the added horizontal joint in attached sketch SKA-4476a. Per response to QBD TG08.4-006; the two manufacturers listed are able to produce 0.125 Aluminum panel material with 72"x 144" girth. Based on these parameters, the contractor shall submit shop drawings with the horizontal and vertical joints indicated in architectural drawings. Vertical joints in the W-16C System panel must be coordinated with the W-1 System structural connections points to the building superstructure. Additionally, GC should coordinate attachment of W-1 System escutcheons/closure assemblies to the W-16C panel.
TG08.4-013	2/23/2015		Inclusion #23, A1-7846, A1-7880, A1-8586	<p>Exhibit A – scope of work item 23-indiacted design, furnish and install stud partitions behind 16A, 16B, 17, and 19. Details on sheets 7846, 7880, and 8586 seem to be quite clear. Design is contrary to west coast construction, and has several constructability issues,</p> <p>Is package design build, where we have liberty to change components in various wall assemblies.</p>	TG08.4 is a Design Build Package. The drawings describe the design intent, which includes technical requirements indicated in the drawings for performance reasons. The Specifications detail the performance requirements and quality. Some components in various wall assemblies may be changed as long as the design and performance requirements are maintained.

1 SECTION 07 42 13 - PREFORMED METAL AND CLAY PANEL CLADDING
(W-16, W-17, W-19 & W-21) 1

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes the Following:

1. Flat (pan type), prefinished aluminum wall and ceiling panels (W-16A).
 2. Flat (pan type), stainless steel wall panels (W-16B).
 3. **3... Break-formed reinforced aluminum cladding (W-16C).**
 4. Corrugated prefinished aluminum wall panels (W-19).
 5. Prefinished modular façade trellis (W-17) mounted on prefinished aluminum wall panels (W-19).
 6. 1 Clay Panel Cladding (W-21) terra cotta on aluminum support assembly attached to structural metal studs.
 7. Aluminum back pans supporting the waterproof membrane behind metal panels.
 8. Concealed supports for the above, consisting of Zee channels, girts and other supports and bracing to the main framing members (steel studs and primary structural steel supports).
 9. Waterproofing membranes behind metal panels W-16A, W-16B, W-19 and W-21.
 10. Semi-rigid insulation associated with the above.
 11. Miscellaneous filler and flashing pieces in or on exterior enclosure and not specified in other Sections.
 12. Elastomeric and stainless steel flashing within assemblies, and between assemblies and contiguous construction.
 13. Sealants and gaskets.
 14. Anchors, fixings, attachments, and reinforcement required for a complete installation, except those specifically indicated to be provided by other trades.
 15. Support and fastening elements required by other trades.
 16. Finishes, protective coating and treatments.
 17. Coordination with structural metal stud framing, electrical, security, fire alarm, and door hardware which are the responsibility of this Section.
 18. Electrical continuity and grounding of this work.
 19. Visual mockups.
 20. Source and field quality control testing.
 21. 1 Warranties and indemnities.
 22. **3D Computer model, shop drawings, structural calculations, samples, manufacturer's product data, certifications of compliance and warranties pertaining to the work of this section. ...3**
- B. Refer to Division 01 Specification Section 018113, 'General LEED Building Design & Construction Requirements,' for additional LEED requirements.
- C. Refer to Section 08 05 13 for additional requirements.
- D. Refer to Section 08 91 00 for aluminum louvers in W-19.
- E. 1 Refer to Structural Metal Stud Framing System Section 05 41 00 for coordination of back-up wall. 1

3...

F. **The work of this Section is Design/Build which is a process where the contractor awarded this portion of the work is responsible for the requirements specified below. The Contractor awarded this portion of the work shall engineer, fabricate and install the work of this Section in accordance with the design intent, design criteria, performance requirements, applicable codes and ordinances at the time of award, and requirements of the AHJ. Structural and operational design requires the certification of a California-registered structural engineer who shall also become the engineer of record for this portion of the work.**

1. **In addition, the Contractor shall be responsible for preparation and submittal of Samples, Shop Drawings, Product Data, calculations, tests reports, and other required submittals for review by the design team and the AHJ.**
2. **Fabrication and installation of the Work without the acceptance of Shop Drawings by the design team and AHJ is not allowed and will be at the Contractor's risk and costs.**
3. **Mockup construction is also a requirement of this Section and its cost shall be included in the Contractor's Bid. ...3**

1.2 ABBREVIATIONS AND ACRONYMS

- A. AHJ: Authorities Having Jurisdiction.
- B. AAMA: American Architectural Manufacturers Association; www.aamanet.org.
- C. AISC: American Institute of Steel Construction; www.aisc.org.
- D. ASTM: American Society for Testing and Materials
- E. AWS: American Welding Society.
- F. BAAQMD: Bay Area Air Quality Management District.
- G. CBC: California Building Code
- H. LEED: Leadership in Energy and Environmental Design.
- I. MSDS: Material Safety Data Sheets.
- J. NAAMM: National Association of Architectural Metal Manufacturers
- K. PVDF: Polyvinylidene Fluoride.
- L. QC: Quality Control
- M. SCAQMD: South Coast Air Quality Management District.
- N. SSPC: Society for Protective Coatings
- O. SWRI: Sealant Waterproofing & Restoration Institute.
- P. TJPA: Transbay Joint Powers Authority
- Q. VOC: Volatile Organic Compound.

1.3 DEFINITIONS

- A. General: The work of this Section is referred to as "Assembly" or "Assemblies" herein.

- B. Contractor: As used in this Section, the “Contractor” is the entity responsible for providing (within the dimensional limits indicated) the work of this Section.
- C. **3 . . . Contractor’s Design** Engineer: Full time California-licensed professional structural engineer, employed by the Contractor, carrying professional liability insurance, with a minimum 5 years’ experience in the design of exterior assemblies similar in scope to those for the Project, including drawings, testing program development, test-result interpretation, and comprehensive engineering analysis that show the systems' compliance with the specified requirements. Engineering services are defined as those performed for installations of assemblies similar to those indicated for this Project in material, design, and extent. **. . . 3**
- D. Engineer (verb) and Engineering: As used in this Section, includes engineering, fabrication and installation.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meetings: Comply with Section 01 12 00 and Section 01 14 00. Where the provisions are in conflict, the more restrictive requirements apply.
- B. Prefabrication Meetings: Comply with Article 1.7 of Section 01 14 00.
- C. Coordination Drawings: Prepare coordination drawings for efficient installation of the assemblies specified where installation space requires close tolerances, where work of other Sections is integrated in the work of this Section, and when coordination for installation of products and materials fabricated by separate entities in the work of this Section is required.
 - 1. Indicate relationship of components shown on separate Shop Drawings.
 - 2. Indicate required installation sequences.
 - 3. Refer to Divisions 08, 22, 23 and 26 for specific coordination drawing requirements for mechanical and electrical installations.
- D. Coordination:
 - 1. Notify other trades of items required to be incorporated into work of separate Sections. Certain components specified in this Section include items closely integrated with doors, flashings, and architectural metalwork specified in other Sections require close coordination with such allied trades. Be responsible for coordination with these other trades to ensure correct installation procedures and results.
 - 2. Coordinate and cooperate with subcontractors of adjacent systems by installing closures and trim supplied by work of other Sections and installed in the work of this Section.
 - 3. Verify locations of embeds and existing adjacent structural supports by field measurements before fabrication and indicate measurements on Shop Drawings. Prior to start of Shop Drawings preparation, coordinate tolerances of other trades that may affect the work of this Section.

1.5 DESIGN CRITERIA

- A. Structural Properties:
 - 1. Dead Load: Actual weight of materials incorporated in work plus Modular Façade Trellis System (W-17) where occurs.
 - 2. Building Maintenance Systems: Inward, outward and lateral pressures imposed by the window washing equipment; refer to Section 11 24 23 for Façade Access Equipment Specification.
 - 3. Loads from other Trades: Loads imposed by the work of other trades.

4. Loads Imposed on Primary Supports: The work of this Section shall not cause re-design of the primary structural supports. Loads imposed to the building structure shall be less than the assumed loads indicated on Building Structural Engineer's Structural Drawings.
 5. Wind Loads: As defined in the RWDI report "Cladding Wind Load Study Transbay Transit Center San Francisco, California" dated November 15, 2011, referred to in Section 00 03 50. Reduction factors for tributary area for Main Force Resisting structure may be applied according to the report. Use maximum positive and negative wind loads for calculations.
 - a. Design metal cladding to accept 150 percent of design wind loads without failure or permanent set in excess of L/1000.
 - b. Address and reinforce higher loads (hot spots) on a case-by-case basis, as determined by the Structural Engineer and indicated in "Cladding Wind Load Study".
 6. Seismic Loads and Drift: In addition to fulfilling Seismic Requirements of ASCE 7-05 Chapter 13 and 2007 CBC, the following applies to the metal cladding assemblies.
 - a. Assemblies shall be considered a critical non-structural component. Refer to Building Structural Engineering Drawings S-0005, Note CD-6 for seismic design criteria.
 - b. Engineer and detail metal cladding to avoid damage and permanent set to the metal cladding at the building drifts and accelerations indicated and specified.
 - c. Design fasteners of the connecting system to the primary structural system to remain elastic under the accelerations and imposed building drifts.
- B. Temperature Range: Assembly shall provide for thermal movement over an ambient exterior temperature range of plus 20 to plus 100 degrees F; an exterior metal surface temperature of plus 20 to plus 180 degrees F.; an interior temperature range of plus 55 to plus 80 degrees F. Structural analysis shall be performed for a temperature range of 160 degrees F. (20 degrees F. to 180 degrees F.).
- C. Water Penetration:
1. Assemblies shall be pressure equalized and designed using rainscreen system with 2 layers of defense with rainscreen seal and continuous air seal system.
 2. Provide internal ventilation drainage system of weeps based on principles of pressure equalization to ventilate assemblies internally and to discharge condensation and water leakage to exterior as inconspicuously as possible at every level for assemblies installed on multiple levels, by creating horizontal compartmentalization. Similarly, provide vertical compartmentalization where required to control water, air and condensation while maintaining air seal between interior and exterior.
 3. No water penetration is allowed thru the secondary barrier when tested in accordance with ASTM E331 for one 15 minute cycle at a static pressure difference of 12 psf minimum.
- D. Refer to Section 08 05 13 for additional requirements.

1.6 SUBMITTALS - GENERAL

- A. Comply with the General Conditions and Section 01 13 00, except as specified below. Where the provisions are in conflict, the more restrictive requirements apply. Do not submit items not requested.

- B. Submit statement of all design assumptions (including applied loading, material properties, static increase factors, dynamic increase (strain-rate enhancement) factors, dynamic load factors, mass assumption, damping assumptions etc.).
1. For coordination purposes, submit preliminary Shop Drawings.
 2. Submit samples, technical material and pre-test results for review prior to submission of shop drawings.
 3. Submit preliminary and final computer modeling of the assemblies, together with a 3D computer model of assemblies' geometry.
 4. Submit test reports on material and assembly testing as specified.
 5. Before commencing work, submit a written statement signed by the Contractor and the Manufacturer/Fabricator certifying that the Contract Documents, shop drawings and product data have been reviewed with material manufacturers' qualified technical representatives and that they agree the selected materials are proper, compatible with contiguous materials and adequate for the application shown.
- C. **3... Contractor's Design Engineer Responsibilities: ...3**
1. Preparation and supervision of Shop Drawings production and structural calculations.
 2. Submission of structural analysis and calculations.
 3. Stamping and signing each Shop Drawing and associated structural calculations.
 4. Submissions for coordination meetings.
 5. Obtaining approvals from the AHJ for calculations and Shop Drawings.
- D. List of Suppliers:
1. Prior to submitting shop drawings or samples, submit a complete listing of products, manufacturers and fabricators for the work of this Section. TJPA Representative's review of listed firms will not be completed until review of subsequent submittals.
 2. Complete the submittals of manufacturer's data and samples required by other Sections of these Specifications, prior to submittal of shop drawings.
- E. Product Data:
1. Submit manufacturer's literature and specifications describing the general properties of each material and accessory to be used in the Work including primary function, quality, performance, location and details of construction relative to materials, dimensions of individual components, profiles, and finishes. Include a statement that each product to be provided is recommended for the application shown.
 2. Product information on sealants to be used, complete with recommendations and installation instructions.
 3. Painting System Description:
 - a. Submit a complete written description of each type of shop coating and touchup painting. Include statement verifying that the selected painting materials and systems are proper and adequate for the application shown, including compatibility of each coating product within each painting system.
 - b. Differentiate between shop and field applied portions of system.

- F. Shop Drawings: As soon as possible after award of Contract, submit shop drawings that include full size details with actual dimensions and thickness of components, engineering calculations, 3D computer model showing attachments, geometry, etc. Indicate where and how the proposed design deviates from the Contract Documents. When the survey of the primary structural steel supports is available, adjust dimensions on shop drawings accordingly before submitting them to the TJPA Representative. Show and identify the following.
1. Prepare details at not less than half full size.
 2. For additional requirements, see Section 08 05 10.
 3. Show the metal panel layout on each plane, support framing system, panel attachment members, attachment of modular façade trellis system, secondary water control, jointing, dimensions, sizes and locations of cutouts, relation to work of other trades, and other pertinent data and information.
 4. Include large scale details that cannot be shown in elevations or sections. Include 3-dimensional or axonometric drawings to illustrate conditions difficult to show in 2-dimensions.
 5. Include typical and atypical details for every member, joint, anchorage system.
 6. Show details of support system, method of attachment to building structure, anchorage details and interface with adjacent work.
 7. Show component locations and intersection details.
 8. Detail fastening and sealing methods and product joinery to ensure proper performance of field installation. Provide interfacing details with adjacent work clearly indicating continuity of air barrier and insulation, etc., when applicable.
 9. Show line of airseal, water drainage, venting and water shed clearly defined, including continuity of air seal and membrane flashing with adjacent trades.
 10. Show method of isolating dissimilar materials.
 11. Show provisions for thermal movements.
 12. Show dimensioned adjustment provisions in anchors (fixings) that will be used to attach assemblies to primary structural system.
 13. Provisions for adjustment of anchors relative to tolerances of building structure: Provide maximum structure deviation which the anchor can accommodate (level, up, down, in and out) at edge of slab, columns and corners.
 14. Show method of accommodating wind induced, seismic, thermal, and live load differential vertical and horizontal movement.
 15. Show section moduli of wind loading components and calculations of stresses and deflections. Provide material properties and other information needed for structural analyses.
 16. 1 For mockup: Provide a full scale mock-up 20 feet long by 20 feet height demonstrating two corner conditions, two end conditions and adjacent panel conditions. Submit shop drawings in same format and content as Project shop drawing. 1
 17. Final comment on shop drawings will be contingent upon complete submission of structural calculations, documentation, certifications, approval of anchors, firestop assemblies, Samples, mockups, and test reports.
 18. Provide copies of final reviewed shop drawings to the AHJ and obtain their approval thereof.
 19. Indicate access for wireless access port in Shop Drawings – Locations as indicated on drawings.
 20. 1 Provide panel replacement procedures for W-16A, W-16B and W-21 in case of damage. 1

- G. Combined Submittals: Assemble and submit as one package, shop drawings for the work of this Section together with shop drawings of components specified in other Sections, which must be integrated in the work of this Section. Prepare coordination details and erection diagrams showing integration and coordination of the work. In addition, coordinate other work, contiguous to the work of this Section but not part of System W-5, into this shop drawings submittal
- H. Layout Drawings for Anchorage:
1. Submit location drawings for fasteners and anchorages to be embedded in concrete showing type of fixing, location, setting-out dimensions and acceptable setting tolerances. Complete floor plans, elevations (if required) and full size details of the embedded anchorage together with a fully coordinated set of structural calculations.
 2. Include details of each type of embedded anchor and/or fixing in the submittal.
 3. Draw details full size and completely annotated.
 4. Identify areas where components are attached without the use of embedded anchorage.
- I. Erection Drawings: Provide detailed erection drawings and erection sequence and descriptions.
- J. Samples: Submit labeled samples to indicate product, characteristics, and location in the Work. Provide sufficient samples to establish the acceptable range of color and texture for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor.
1. Submit 3 full size samples of the following components of the system. For steel components, paint one-half of the Samples, in the color selected. For aluminum components, submit Samples of color and finish prepared as specified on respective aluminum components for both extrusion and sheet. Indicate range of proposed color and sheen. Mark direction of metal grain and rolling and paint application on back of control Samples.
 - a. Finish metal Samples; 12-inch square of each type.
 - b. Fastening devices, each type.
 - c. Finish hardware, each type.
 - d. Gaskets; 12-inch long of each type.
 - e. Sealants, cured samples; 12-inch long of each type and color.
 2. Samples demonstrating methods of sealing both primary and secondary seals of expansion joints within assembly as well as method of preventing molecular breakdown where assemblies meet surrounding dissimilar systems and joints.
 3. Sealant manufacturer's production run Samples of metal, to be used to perform adhesion and compatibility tests both prior to site work, and progressively as construction proceeds, as specified.
- K. Design Calculations: Submit the following.
1. Sealed and signed calculations prepared by the Design Engineer, providing design assumptions regarding loadings in compliance with the CBC, applicable Standards, and the AHJ.
 2. Detailed designs of framing members, as well as detailed designs of anchorage hardware including but not limited to, clip angles, washers, anchor bolts, welds and torque pressures.
 3. State proposed materials and their allowable shear and bending stresses, ensuring failure load is substantiated by previous tests and in accordance with AAMA TIR-A9.
 4. Design calculations verifying conformity with specified loading requirements.

5. Design calculations and tabular data for design of members, including methods of attachment to supporting structure with design loads and maximum support reactions. Prepare calculations in a clear and comprehensive manner so they can be easily reviewed and cross-referenced to applicable shop drawing detail.
6. Type and location of fixing with regard to loads applied to building structure. Include deflection summary for anticipated primary structural deflections, as shown on Structural Drawings.
7. Anchor clips, inserts and fasteners and/or assemblies including bolts and stiffeners. Analysis shall include loadings diagrams of superimposed loads to be transferred to and accommodated by the building structure for each type of anchor, fastener and connection demonstrating that loads imposed to primary building structure are less than the assumed loads indicated on the Structural Drawings.
8. Stability calculations.
9. Local bending of member components.
10. Strength of embedded anchor assemblies as well as pull out and/or reaction forces shared with the building structure.

L. Sealants:

1. Submit the following to sealant manufacturers:
 - a. Shop drawings showing panel size, design loads and sealant dimensions for evaluation and statement on stress.
 - b. Test samples of substrate materials that will be in contact with sealant.
2. Submit written certification from sealant manufacturer that sealant applications in specified systems have been reviewed and approved as appropriate for their intended use in systems detailed on Shop Drawings. Reference drawing number, date and revision, with regard to design criteria and other requirements of the Contract Documents and compatibility with components and adjacent materials together with life expectancy of sealant materials detailed and specified.
3. Ensure that sealants are verified by SWRI in accordance with ASTM C 719 and ASTM C 661.

M. Laboratory Test Results:

1. 1 Prior to fabrication, submit existing test results applicable for work of this Section from a testing organization conforming to requirements of ASTM E 699, ASTM E 330, ASTM E 283, ASTM E 331, AAMA 501.4, AAMA 501.6 and acceptable to TJPA Representative. 1
2. Allow sufficient time for testing (where required), evaluation, alterations and re-testing (where required) so not to interrupt construction progress schedule for Project. Pay costs for modification, re-fabrication and reinstallation of rejected test units or portion thereof until tests are completed satisfactorily.
3. As soon as possible after award of Contract, submit Shop Drawings that include full size details with actual dimensions and thickness of component parts, engineering calculations, describing test unit assemblies and test procedures for TJPA Representative's review.

- N. Painting System Description: Submit a written description of the shop coating and touchup painting of the "Architecturally Exposed Structural Steel" systems. Itemize the materials, methods (including specific substrate preparation), procedures and sequence to be followed for exposed painted steel components, and arrange the description to correspond with the fabrication and erection schedule. Include statement verifying that the selected painting materials and systems are proper and adequate for the application shown, including compatibility of each coating product within each painting system.

- O. Certifications: Submit the following.
1. Prior to fabrication, submit a written statement signed by the Contractor and the Manufacturer/Fabricator certifying that the Contract Documents, shop drawings and product data have been reviewed with material manufacturers' qualified technical representatives and that they agree the selected materials are proper, compatible with contiguous materials and adequate for the application shown.
 2. After completion, submit copy of certification in an approved form, stating that the completed assemblies comply with these Specifications, that the components were properly designed or selected for the application made, and that installation methods complied with manufacturers' printed instructions and their field representatives' verbal instructions, and were proper and adequate for the condition of installation and use in each case, signed by the Contractor and the firm(s) awarded the work of this Section.
- P. Test and Evaluation Reports: Prior to fabrication, submit certified test data performed by an independent approved laboratory displaying results of testing program carried out on assemblies similar to that proposed for the Project.
1. Allow sufficient time for testing (where required), evaluation, alterations and re-testing (where required) so not to interrupt construction progress schedule for Project. Pay costs for modification, re-fabrication and reinstallation of rejected test units or portion thereof until tests are completed satisfactorily.
 2. Provide test report on sealant adhesion to production samples of metal tested in accordance with ASTM C794. Ensure test results show compliance with criteria specified.
 3. For thermal stress analysis, submit results of a thermal stress analysis.
- Q. Record Documents (As-Built)
1. General: The provisions of Article 3.09 of the General Conditions and Sections 01 17 20 apply to the Section.
 2. Drawings: Comply with the requirements of Division 01 and the following.
 3. As Work progresses, clearly mark changes and deviations from Shop Drawings on a bound set of white prints.
 4. Keep prints available at site for periodic inspection throughout duration of Work. Pay particular attention to accurately dimensioning the exact location of concealed work, noting work concealed in inaccessible locations.
 5. When work of this Section is complete and ready for inspection, neatly transfer as-built information from marked-up prints mentioned above to a set of Contract Drawings with the most recent revision and submit to the TJPA Representative.
- R. Contractor's Quality Control (QA/QC) Submittals: Comply with the requirements of Section 01 14 00.
- S. Special Warranty: Warranty form from the manufacturer.

1.7 CLOSEOUT SUBMITTALS

- A. Submit maintenance instructions in accordance with Section 01 70 00. Include in Maintenance Manual: Include the following.
1. Printed copies of maintenance instructions for, and proper care and maintenance of the work of this Section.
 2. Copy of each reviewed Shop Drawing in its most recent amended form.
 3. Complete parts and materials list method statement for replacement of components.
 4. Instructions for proper cleaning and routine maintenance of assemblies including recommended frequency.

5. Recommended inspection schedule.

- B. Furnish touchup repair kit or touchup instructions to the TJPA for each type and color of factory-applied finish.

1.8 LEED SUBMITTALS

- A. Within 30 days of Contract award, assemble and submit all LEED material information on the "LEED Material Tracking Spreadsheet" and forms provided in the Project Manual, together with all supplemental documentation as required by LEED.
- B. Credit MR 4: Product data indicating percentage by weight of post-consumer and post-industrial recycled content for products having recycled content. Include a statement indicating projected costs for each product having recycled content.
- C. Credit MR 5: Product data indicating location of source material acquisition and location of manufacture/fabrication. Include a statement indicating projected costs for each product being sourced, processed, and manufactured/fabricated within a straight-line 500 mile (800 kilometer) total travel distance of the project site using a weighted average determined through the following formula: $(\text{Distance by rail}/3) + (\text{Distance by inland waterway}/2) + (\text{Distance by sea}/15) + (\text{Distance by all other means}) = 500 \text{ miles [800 kilometers]}$.
- D. Credit IEQ 4.1: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all adhesives and sealants used on the project and demonstrating compliance with SCAQMD Rule #1168, effective July 1, 2005 and amended January 7, 2005. Provide manufacturer's product data for aerosol adhesives, including printed statement of VOC content that demonstrates compliance with the limits defined in Green Seal standard GS-36, in effect October 19, 2000.
- E. Credit IEQ 4.2: If field applied, provide manufacturer's MSDS or technical data sheet showing a printed statement of VOC content for all paints and coatings used on the project and demonstrating compliance with Green Seal standard GS-11, Paints, May 20, 1993; with Green Seal GC-03, Anti-Corrosive Paints, January 7, 1997; with SCAQMD Rule #1113, effective January 1, 2004.

1.9 QUALITY CONTROL

- A. Regulatory Requirements: In addition to LEED requirements, comply with BAAQMD requirements referenced in Section 01 14 10.
- B. Regulatory Requirements: In performing the work of this Section, comply with applicable requirements of the laws, codes, ordinances and regulations of the AHJ. Obtain necessary approvals from the AHJ.
- C. Corrosion Analysis:
1. ~~3.1.1. Engage a licensed engineer who is an expert in corrosion, to conduct~~ **Conduct** a component-by-component analysis of potential corrosion resulting from galvanic action between materials, for components of curtain wall and aluminum panels and provide report. 3.1.1
 2. Submit Engineering Report to TJPA Representative, for review prior to submission of Shop Drawings. Ensure Sample and test results are available upon request.
 3. ~~3.1.2. Separate dissimilar metals to prevent electrolytic action. Provide letter of confirmation from Engineer specified herein that infill components, accompanying trims and flashings and attachments to adjacent construction are designed to eliminate potential for galvanic action between components.~~ 3.1.2

D. Contractor's Testing and Inspection Program:

1. Provide and maintain an effective QC program and perform sufficient inspections, surveys and tests of all items of Work, including those of other trades, to ensure compliance with the Contract Documents and the requirements of AHJ.
2. Furnish appropriate facilities, accurately calibrated instruments and testing devices required to perform the QC operations with sufficient work forces to cover the construction operations within the actual construction sequences. Coordinate this work with the QC requirements of other Sections of the Specifications and with requirements of the TJPA and the AHJ.
3. Establish and submit for review, a quality QC program to monitor quality of cleaners, primers, silicone sealant, shelf life, workmanship and adhesion of specified structural silicone sealant. QC program for silicone sealants shall encompass both initial testing of components for sealant adhesion/adhesion compatibility, etc. and random testing of production run materials, etc.
4. The program shall also include testing at full negative design pressure, on one unit per one 100 manufactured for the Project. Testing shall be witnessed and certified by the Design Engineer.
5. The program shall also include the establishment of methods to monitor sealant application to ensure full sealant contact and full cure prior to being moved.
6. Do not start sealant work prior to submission and acceptance of this program.

E. Responsibilities for TJPA's Inspection Services:

1. Furnish the Inspection Agent(s) access to the Work, both in plant and field, without the need to execute special scaffold releases in order to facilitate all inspections.
2. Provide adequate notice of construction activities to allow timely inspections and observation of Contractor tests, and be available for "Pre-fabrication Meetings" and "Pre-Construction Meetings".

F. TJPA's Inspection Program: TJPA's inspection agent will conduct such inspections as necessary to verify compliance or deficiencies of all items listed in Part 3 of this Section.

1. The TJPA will retain an independent Inspection Agent to verify compliance of the work of this Section with the Contract Documents by performing inspection services for the work indicated and specified, and required for the Project. Inspection services will be performed at the Project site and, if work is performed off site, inspection of work in fabrication plants. Inspections performed by the TJPA's Independent Testing Agency(s) shall not relieve the Contractor of his responsibilities under this contract.
2. 1 The TJPA's Inspection Agent will perform inspection of the assembly during construction at timely occurrences to satisfy the governing AHJ and the quality control established for the Project by the Contract Documents. 1
3. The TJPA's Inspection Agent will conduct the following tests and perform the following inspections:
 - a. Weld Testing: Non-destructive testing of exterior enclosure welds, utilizing one of the following test methods which best suits the types of welds to be tested.
 - b. Liquid penetrant test.
 - c. Magnetic particle test.
 - d. Radiographic test.
 - e. Ultrasonic test.
4. Inspection Compliance: The TJPA's inspection agent will conduct such inspections as are necessary to verify compliance or lack of compliance of the following.
 - a. Examination: Survey of the supports to receive the work of this Section and applicable corrective work performed, if any. Verification that the supporting structure is properly aligned and within the designed tolerances.

- b. Connections and Anchors: Verification that all anchors are properly placed, welded or bolted. Verification that correct anchoring and/or materials are used in lieu of others where there are field changes. Inspection of welding and bolting where connections are stressed to 50 percent or more of allowable values. Verification of the calibration of wrenches, review of bolting procedures and inspection of joint surfaces prior to bolting for all bolted connections related to the exterior enclosure. Verification of welder's license, qualifications and welding procedures for all welds related to the exterior enclosure. Verification of proper welding or bolting of reset connections.
- c. Joints and Sealants: Verification that horizontal and vertical movement joints have been provided, and verification that joints are free from obstructions. Confirmation that accepted sealant materials are provided. Verification that sealant joints are properly sealed, and that the materials possess sufficient elongation capacity for movement anticipated. The recording of any unanticipated movement or displacement beyond performance criteria.
- d. Preliminary and final computer modeling of the assemblies.
- e. Test reports on material testing and assembly testing as specified.

G. Qualifications:

- 1. Welding: Verify and confirm that welding of structural components will be performed by fabricators certified in accordance with AWS QC7, and are qualified to weld stainless steel using TIG equipment. Verify and confirm that welders are familiar with welding procedures for structural welding of carbon and stainless steel, aluminum and sheet steel.
- 2. Installers: Competent installers with minimum 10 years experience in the application of products, systems and assemblies specified and with approval and training of the product manufacturers.
- 3. Testing Agency: Independent agency qualified according to ASTM E699 for testing indicated.

H. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of the AHJ. Obtain necessary approvals from the AHJ.

I. Preconstruction Sealant Compatibility and Adhesion Testing: Test results confirming compatibility and adhesion are mandatory for concealed and exposed sealant materials in contact with exterior glazing, other sealants, flashings, metal framing and shims prior to full size sample installation construction. Conduct testing as follows.

- 1. Test a minimum 5 production-run samples each of metal, glazing, and other material.
- 2. Prepare samples using techniques and primers required for installed assemblies.
- 3. Perform tests under environmental conditions that duplicate those under which assemblies will be installed.
- 4. For materials that fail tests, determine corrective measures necessary to prepare each material to ensure compatibility with and adhesion of sealants including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.

J. Sealants:

- 1. Submit the following to sealant manufacturer:
 - a. Shop drawings showing size of lites, design loads and sealant dimensions for evaluation and statement on stress.
 - b. Test samples of substrate materials that will be in contact with sealant to the sealant manufacturer as specified.

2. Submit written certification from sealant manufacturer that sealant applications in specified systems have been reviewed and approved as completely appropriate for its intended uses in systems as shown and detailed on Shop Drawings, designating drawing number, date and revision, with regard to design criteria and other requirements of the Contract Documents and compatibility with components and adjacent materials together with life expectancy of sealant materials detailed and specified.
3. Ensure sealants are verified by SWRI in accordance with ASTM C 719 and ASTM C 661.

K. Mockups: Provide at Project site, where acceptable to, and for review by the TJPA Representative, a visual mockup of each type of metal cladding as follows. Provide joint conditions, anchorage, detail work, finish and other materials and features as will be used in the final Work.

1. 1 Mockups shall be sized, at a minimum span of 2 panel joints in each direction (approximately 20 feet x 20 feet). 1
2. Provide W-16A siding mockup with a corner condition.
3. Mockup of W-16B siding can be combined with mockup of W-19 siding. This mockup requires a corner condition.
4. 1 For the mockup of W-17 and W-21 cladding, provide a wall opening and corner conditions. 1
5. Clean mockups with materials and techniques intended for use on the Project.
6. Replace unsatisfactory mockup(s) as required to obtain approval of the TJPA Representative. The approved mockups will become the standard of workmanship for the Project. The approval of the mockups does not relieve the Contractor of its obligation to perform the work in accordance with the Contract Documents as indicated in Drawings.

1.10 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Deliver, store and handle the work of this Section to ensure to avoid damage and stain.
2. Crate components to prevent accumulation of moisture between panels.
3. Deliver materials, except those in bulk, in their manufacturer's unopened containers with name, brand, type, grade and color indicated thereon; further mark containers with installation location, fabrication/piece numbers, shop drawings reference, etc., as applicable.
4. Store materials to avoid deleterious effects of weather, soiling or contamination.

B. Storage:

1. Store above grade on flat, dry surfaces using polyethylene film to separate panels from supporting or protecting members.
2. Protect from weather, soiling and damage.

1.11 WARRANTIES

A. General:

1. The warranties are governed by the requirements herein, those of Section 01 17 40, and the General Conditions of the Contract.
2. Warranties specified in this Article shall not deprive the TJPA of other rights the TJPA may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

- B. Special Warranties:
1. General: Except where longer warranties are specified below, provide a 10-year warranty against defects in the design, workmanship, and quality of materials, watertight integrity, or performance of the assemblies. The warranties shall include all components and accessories and shall cover materials and on-site labor to repair or replace defective components for the entire warranty period.
 2. Sealants: Provide sealant manufacturer's 20-year materials warranty and limited labor warranty, including statement that sealants used in the Work will not cause contact surfaces to become discolored or change its appearance due to fluid migration.
 3. Fluoropolymer Metal Finishes: Applicator 20-year warranty, covering film integrity and fade resistance as defined by ASTM D 2244, and chalk resistance as defined by ASTM D 65, and as further defined below.
- C. Defects: Defects are defined to include, but not limited to the following.
1. Penetration of water into the building.
 2. Air infiltration into the building.
 3. Structural failure of components resulting from forces within specified limits.
 4. Sealants:
 - a. Adhesive or cohesive failure of sealant.
 - b. Craze on surface of sealant.
 - c. Sealant hardening beyond Shore A durometer 50 or softening below 20.
 5. Collapse of thermal insulation.
 6. The terms used in conjunction with finish warranty are defined as follows:
 - a. "Discoloration or fading": means a change in appearance which is perceptible and objectionable as determined by the TJPA Representative when viewed visually in comparison with the original color range standards.
 - b. Color changes shall not exceed 2 ΔE_{00} (CIEDE2000) as defined by ASTM D 2244 for warranty period.
 - c. Chalking shall not exceed a number 4 rating for colors and a number 3 rating for whites as defined by ASTM D 4214 for warranty period.
 - d. "Excessive non-uniformity": means non-uniform fading during the period of the warranty to the extent that adjacent parts have a color difference greater than the original acceptable color range.
 - e. "Pitting, cracking, peeling, crazing or corrosion": means there shall be no pitting, surface cracks, blistering, bubbles, or non-uniform surface texture or other type of corrosion discernible from a distance of 12 feet, resulting from the elements in the atmosphere at the Project site.
- D. Failure of the Work to meet other specified performance requirements.
- E. Exceptions: Warranty does not include damage caused by vandalism, or natural conditions exceeding the performance requirements. Warranty and its enforcement shall not deprive TJPA of other action, right or remedy.

- F. Remedy: Upon notification, promptly correct defects and deficiencies which become apparent within warranty period to satisfaction of the TJPA Representative and at no expense to TJPA.
1. Certify in writing that installed work is in accordance with the Contract Documents and authorized alterations and/or additions thereto and that, should defect develop during the warranty period due to improper workmanship or materials installed as a part of this Section, such defects will upon written request, be repaired or replaced at no additional cost to the TJPA.
 2. If exploratory work is required to determine the cause of the defects, the cost of such work shall be borne by the Contractor when his work is found to be at fault.

1.12 RECORD DOCUMENTS (AS-BUILT)

- A. General: The provisions of Article 3.09 of the General Conditions and Sections 01 17 20, apply to this Section.

PART 2 - PRODUCTS

2.1 LEED REQUIREMENTS

- A. Credit MR 4: Provide steel materials with minimum 30% recycled content where the total recycled content equals the sum of post-consumer recycled content and ½ post-industrial recycled content.
- B. Credit MR 4: Provide aluminum materials with minimum 50% recycled content where the total recycled content equals the sum of post-consumer recycled content and ½ post-industrial recycled content.
- C. Credit IEQ 4.1: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide adhesives and sealants with VOC content and chemical component limits not exceeding the content limits defined by SCAQMD Rule #1168, July 1, 2005, amended January 1, 2005, and Green Seal GS-36, effective October 19, 2000 for aerosol adhesives as applicable
- D. Credit IEQ 4.2: All VOC containing materials applied on site inside of the waterproofing barrier shall comply with LEED credits IEQ 4. Provide paints and coatings that comply with the limits defined by Green Seal Standard GS-11, effective May 20, 1993, GC-03, January 7, 1997, and SCAQMD Rule #1113, effective January 1, 2004, as applicable.

2.2 MANUFACTURERS

- A. **3. . .** Modular Façade Trellis System: (W-17) Basis of Design GREENscreen, **McNichols ecoMesh** – or equal. **. . . 3**
- B. Corrugated Aluminum Panels (W-19): Pre-finished series CS 260, 0.32 inch thick panels, with concealed fasteners, by Centria (basis of design), by Petersen Aluminum Corp., or equal.
- C. Flat Aluminum and Stainless Steel Panel Systems (W-16A and W-16B), panel thicknesses to be determined for each condition of use, by Centria, or equal by one of the following.
1. **2** Centria
 2. Pohl.
 3. Tajima.
 4. **2** Dri-Design.

D. Product Options:

1. Information on Drawings and in Specifications establishes requirements for the aesthetic effects and performance characteristics of work of this Section. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sight lines and relationships to one another and to adjoining construction.
2. Performance characteristics are indicated by criteria subject to verification by one or more methods including established engineering methodology (i.e., calculations) preconstruction testing, field testing, and/or in-service performance.

2.3 PERFORMANCE REQUIREMENTS

A. General: The work of this Section shall meet or exceed the following structural and weather resistance criteria demonstrated by engineering calculations and on-site testing.

1. Sizes indicated and specified are minimums acceptable to the TJPA Representative and shall not be reduced.
2. Assumptions made by the Contractor shall be analytically and mathematically proven, except when proven by physical testing methods. Calculations and related data and their application in engineering, fabrication, assembly and installation are the Contractor's responsibility.

B. Provide assemblies that are air- and water-tight, structurally sound under loads and movement indicated and specified, and integrated with other adjacent assemblies of the exterior enclosures.

1. When installed, failure of any one element, such as bolt, anchor, screw, embed, shall not result in progressive failure of the assemblies.
2. Design attachments to permit replacement of individual panels during construction, or in subsequent usage of building, without dismantling or disturbing adjoining panels. In addition, replacement shall be achieved without alteration of the original design features.
3. 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-inch in any direction.
4. Limit stresses in materials to the allowable values established by the standards applicable to the material (aluminum, steel, etc.). In no case shall allowable values exceed the yield stress. Where permitted by Code, a 1/3 increase in allowable stress for wind or seismic load is generally acceptable, but not in combination with any reduction applied to combined loads.

C. 1 Infiltration/Penetration: The work of this Section shall be constructed to prevent air and water infiltration as outlined below:

1. Air Infiltration: ASTM E 283. Allowable air infiltration will be 0.06 cfm or less per square foot when tested under a constant pressure of 6.24 psf.
2. Water Penetration: ASTM E 331. No uncontrolled water penetration shall occur when tested in static and dynamic modes, under a constant pressure of 15 psf with 5 gallons of water per hour applied per square foot for a period of 15 minutes.
3. The complete system is to be designed to evacuate any moisture which penetrates beyond the outside surface materials and to weather proof with membrane flashing around all perimeters and openings through the system.

- D. Average Thermal Conductance: For the Roof Park Level Restaurant provide ~~an overall average U values of not more than 0.45 BTC (square foot/Hr./degrees Fahrenheit) for the wall areas when tested to AAMA 1503.1. As a minimum, provide~~ 4-inch thick semi-rigid mineral wool insulation in spandrel areas with a minimum thermal resistance of R-15.
- E. 3...3 Provide assemblies capable of withstanding, without failure and permanent set (defined as deflection without recovery exceeding 1/1000 times span), in compliance with criteria specified, the effects of dead and live loads, including wind, **and** seismic ~~and blast~~ loading, and building maintenance equipment, thermal movements and those of the supporting structure, and dimensional tolerances of building frame and other adjacent construction. ...3
1. Full loading of the assembly shall not cause loosening and weakening of fasteners and attachments, and other components.
 2. 3...3 Design system based on "Rain Screen Principle" by ~~incorporate~~ **incorporating** means of draining moisture entering the assembly to exterior. Design drainage system to provide clear, internal paths of drainage of trapped moisture to exterior. Ensure weep water discharges in a manner that avoids staining architectural finishes, and collecting in puddles. ...3
 3. Provide continuity of air/water barrier and seal at joints, laps, terminations and penetrations of secondary barrier to prevent air infiltration and exfiltration and to effectively block moisture migration into the building.
- F. Structural and Thermal Movements:
1. Systems shall have sufficient tolerances to accommodate expansion and contraction in metal cladding, and between metal cladding components, the work of other Sections, and building structure due to short and long term structural movements, cyclic temperature changes, twisting, distortion, torsion, seismic and wind sway, seismic and wind racking, deflection, misalignment, buckling, column shortening, creep, noise, undue stress on components and securement devices to work of this Section, work of other Sections and building structure.
 2. Systems shall allow for a differential deflection of floor slabs, beams and wall framing after installation for anticipated primary structural deflections, as required by structural design.
 3. Provide joints wide enough to permit structural and thermal movements, including racking, without damage to components.
 4. Expansion/contraction provisions shall cause no damage, distortion, misalignment of metal cladding, building structure, adjacent construction and connections and shall ensure that air infiltration/exfiltration and water and weathertightness requirements are maintained in secondary barrier.
 5. Work of this Section, regardless of structural and thermal movements to which the metal cladding may be subjected, shall provide free and noiseless movement of components caused by temperature variations and structural deflection or dead loads, without buckling, oil-canning, failure of joint sealants, undue stress on metal members and fasteners and other detrimental effects.
- G. Deflection Limitations:
1. Limit deflection of metal panels to L/240 of the span or 1/4-inch, whichever is less, when tested in accordance with ASTM E 330 at maximum wind pressure. Measure deflection relative to the horizontal and vertical support members with the allowable deflection being determined by the lesser dimension.

2. At 150 percent of the design pressure loads for metal members supporting panels, limit the net permanent deflection of framing members to 1/1000 times span. There shall be no failure or permanent distortion of framing members, anchors or connections. 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-inch set after load is removed.
 3. Submit engineering calculations to show maximum deflections based on full panel loads, uniformly distributed, concentrated loads, building deflections, thermal stresses, and erection tolerances.
 4. W-21 Clay Cladding: Limit deflection to manufacturer recommendation reinforcing, support assembly, structural stud assembly and clay thicknesses as necessary but not less than L/240.
- H. Unacceptable Conditions: Vibration harmonics, wind whistles, noise or vibration created by thermal movement, structural movement, or wind; thermal movement transferred to building structure; loosening, weakening or failure of fasteners, attachments or other components.
- I. 1 Design Modifications: Make design modifications of work only as necessary to meet performance requirements and coordination of the work. Submit variations in details and materials that do not adversely affect appearance, durability or strength to the TJPA Representative for review. Maintain the general exterior design concept without altering profiles and alignments shown. Unless otherwise defined by the Contract Documents, appearance of exposed elements shall be consistent throughout the Project.

2.4 DESCRIPTION

- A. Metal Wall Panel System (W-16A): Pre-finished, aluminum panel cladding systems for Stair 201.
- B. Stainless Steel Wall Panel System (W-16B): Stainless steel cladding systems for the Elevators and Stairs of the Park Buildings.
- C. **3...3 Metal Wall Panel System (W-16C): Prefinished, aluminum break-formed 1/8-inch thick reinforced aluminum cladding for Bus Deck and Roof Park Level perimeter structure.**
- D. Modular Façade Trellis System (W-17): Basis of Design Green Screen. Prefinished, 3-dimensional wire screen mounted on corrugated aluminum panel system (W-19).
- E. Corrugated Aluminum Panel System (W-19): Prefinished, corrugated aluminum panels with concealed fasteners at Park Buildings behind W-17 panels.
- F. **...3 1 Clay Panel Cladding (W-21):** Preformed extruded cladding panels with blacked-out aluminum and stainless steel support assembly and insulation applied to structural stud assembly. 1

2.5 MATERIALS - METALS

- A. Aluminum Sheet:
 1. Type: ASTM B 209 (ASTM B 209M), alloy standard with manufacturer, with temper as required to suit forming operations and structural performance required, and to accept the finish coating specified.
 2. Surface: Smooth, flat finish.
 3. 1 W-16A: 1/8-inch thick minimum, with reinforcement as required.

4. W19: Corrugated: Minimum thickness as required for conditions of use, but not less than 0.050" (18 gage). Basis of Design, "Sinewave" 2.67" x 7/8" by Corrugated Metals Inc., Illinois, USA. I

B. Stainless Steel Sheet:

1. I Type: ASTM A 240/A 240M, Type 316, fully annealed, 1/8" thick minimum. I
2. Surface: Smooth, flat finish.
3. W-16B: Minimum 1/8-inch thick, reinforced as required.

C. Mild Steel:

1. Structural Galvanized Steel Shapes, Plates and Bars: ASTM A36 or ASTM A572, as noted.
2. Galvanized Sheet Steel: 20-gage core thickness commercial quality to ASTM A 653, CS Type A, with Z275 (G90) zinc coating designation to ASTM A 653.
3. Structural Carbon Steel Tubing: ASTM A500 cold formed, grade C.
4. Electrodes, Welding Rods, and Filler Metals: Provide in accordance with AWS D1.1 requirements. Provide materials compatible in strength and appearance with the parent material joined.
5. Galvanized High Strength Bolts, Nuts and Washers: ASTM A325. High-strength bolts shall be subject to the provisions of ASTM A143 to prevent hydrogen embrittlement.
6. Galvanized Bolts, Washers and Nuts:
 - a. Washers: hardened steel washers.
 - b. Nuts: heavy hex nuts, ASTM A194 grade 2H.

D. I DELETED I

E. Protective Treatments:

1. Steel: Unless otherwise indicated, all carbon steel components, including fasteners and accessories, shall be hot-dip galvanized, preferably after fabrication and assembly, with a minimum zinc coating weight of 1.25 oz/square foot as specified in Section 05 05 12. After galvanizing and pretreatment, apply the following treatment to clean, dry, galvanized surfaces.
 - a. Surface Preparation: Coordinate required blast profile with reviewed paint submittal prior to beginning surface preparation. Clean and prepare surfaces to be painted by removing loose rust, loose mill scale and spatter, slag, or flux deposits in accordance with following SSPC requirements:
 - b. For galvanized surfaces: Comply with SSPC SP-7 Sweep Blasting using caution not to remove the zinc coating.
 - c. Painting of Structural Steel: Steel work covered by this Specification Section shall receive surface preparation listed below and then painted as specified in Section 09 97 13. Field touchup of all damage shall be performed in accordance with Section 09 97 13.
 - d. Non-galvanized surfaces:
 - 1) SSPC-SP 1: Solvent Cleaning
 - 2) SSPC-SP 3: Power Tool Cleaning.
 - 3) SSPC-SP 6/NACE No. 3: Commercial Blast Cleaning.
2. Finishes For Stainless Steel:
 - a. Clean and passivate stainless steel in accordance with the requirements of ASTM A380.

- b. Remove scratches, abrasions, dents and other blemishes to the material before applying finish. Apply the following to the fabricated work, with texture and reflectivity as required to match the TJPA Representative sample.
- c. Finish: NAAMM No. 4 brushed finish. If concealed from view, finish for stainless steel may be AISI No. 2D.

2.6 PAINT SYSTEMS AND GALVANIZING

- A. For Aluminum: Fluorocarbon Organic Coating System, AAMA 2605; 4-coat thermally-cured fluoropolymer system.
 - 1. 2 Basis of Design: "Duranar XL Coating" by PPG Extrusion Coating. Products of the following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications: Tnemec, Kynar or Floronar by Sherwin Williams. 2
 - 2. Custom Color: To match TJPA Representative control sample.
- B. Concealed Steel: Hot-dip galvanize all steel members, including as specified in Section 05 05 12.
- C. Galvanizing repair paint: Description: Field-applied, 2-component zinc-rich primer. Provide one of the following.
 - 1. "90-97 Tneme-Zinc" by Tnemec Co.
 - 2. "Amercoat 68HS" by PPG Protective and Marine Coatings.
 - 3. "Catha-Coat 303H" by Devoe High Performance Coatings (Glidden Professional Paints).
 - 4. Or equal.

2.7 ACCESSORIES

- A. 1 Back Pan/Liner and Base Flashing: 18-gage galvanized back pan G-90 steel. 1
- B. Clips, Pins and Fasteners: 300 series stainless steel. Use for attachment to substructure of sizes required to meet performance criteria. Secure clips in the manufacturer's facility to the greatest degree possible. Pop rivet attachment of clips and accessories will not be accepted.
- C. Flashings, Closure Strips and Metal Trim: Of materials to match that of the cladding in material and finish (where exposed), or stainless steel where concealed; thickness as required to fulfill performance criteria.
- D. Cladding Support System:
 - 1. Stud and joist framing members: As specified in Section 05 41 00.
 - 2. Aluminum extrusion panel retention members, clips, angles or panel hangers: Design to fulfill performance requirements specified.
 - 3. Structural steel shapes: ASTM A 36.
 - 4. Steel plates: ASTM A 283, Grade C.
 - 5. "Z" girts: Aluminum minimum 1/8 inch thick.
- E. Backing Rod: Closed-cell foam rod.
- F. Insulation: Semi-rigid mineral wool per Section 07 21 00.
- G. Fire Safing: Mineral wool per Section 07 21 00.
- H. Air/Water Barrier: WPM No.10A as specified in Section 07 13 14.

- I. Miscellaneous Materials:
 - 1. Gaskets or spacers used in panel assembly: Silicone or neoprene complying with ASTM C 509.
 - 2. Sound-deadening compound: 3M or equal. Install to interior of panels within 8 feet of a walking surface.
 - J. Sealants: Non-staining for exterior rain screen sealant. Silicone for air seal sealant. See Section 07 92 00.
- 2.8 FABRICATION
- A. Aluminum and Stainless Steel Panels: "Pan" type panel with integral returns (edges) fabricated from minimum 1/8-inch thick aluminum sheets, except that panels adjacent to walking surfaces shall be 1/4-inch thick. Back cut crease at edges to obtain sharpest possible angle between face and edges, or weld edges to face. Corners need not be welded, but must be tight, flush and back-sealed.
 - B. **3...3 Break-formed 1/8-inch thick reinforced prefinished aluminum cladding complete with aluminum support framing, clips, and reinforced 20 gauge prefinished aluminum back pan for waterproofing membrane specified in Division 07 to clad areas as indicated on the Drawings. Back-cut corners to provide sharp edges.**
 - C. Manufacture cladding under controlled environment in fabricator's plant in conformance with accepted Shop Drawings and calculations so tolerances stated herein are not exceeded. Field fabrication of panels is not permitted.
 - D. Number each panel to correspond to the markings shown on the fabrication or shop drawings. Mark the identification number on the back of each panel.
 - E. Seal inside surfaces of seams, such as the panel returns at corners, to prevent intrusion of water.
 - F. Clean surfaces in compliance with the sealant manufacturer's recommendations, and apply sealant to inside surfaces of seams, such as the panel returns at corners, to prevent intrusion of water.
 - G. Spray sound deadening to back of panels and formed returns.
 - H. Where welds occur, grind and polish to match adjacent surface finish and to be invisible in the finish work.
 - I. **...3 Fabrication tolerances:**
 - 1. Panel bow: Maximum 0.2 percent of width or length, whichever is greater.
 - 2. Width or length: Plus 0.064 to 48 inches; Plus 0.032 to 144 inches.
 - 3. Thickness: Plus 0.008-inch.
 - 4. Squareness: 0.1875-inch difference between diagonals.
 - 5. Camber: 0.062-inch maximum.
 - 6. Radius of exterior bent corners: 1/16-inch maximum.
- 2.9 FINISHING
- A. General:
 - 1. Paint surfaces within panel cavity exposed to air or moisture.
 - 2. Panels shall be flat with no embossed or textured design.

3. For uniformity, finish all panels for an entire elevation at the same time.
- B. Galvanized Steel: No finish required (concealed in the Work).
- C. Finishing Aluminum Surfaces: Specified finish are required on all material exposed to view or to weather, including cut edges.
1. Factory-apply coatings and oven-cure by approved applicators.
 2. Clean, prepare, pretreat surfaces to be coated, and apply coating in compliance with the coating manufacturer's instructions and these Specifications.
 - a. Perform pretreatment of metal surfaces in accordance with the procedure recommended by the coating manufacturer to provide the proper surface for applying the specified coating.
 - b. Dry film thickness of coating on exposed surfaces, when measured in accordance with ASTM D 1400 shall be not less than 33 microns, except in channel recesses and internal corners which shall be visually covered.
 - c. Finished surfaces, when cured, shall be free of flow marks, streaks, sags, blisters or other surface imperfections, such as scratches, scrapes and dents, spots, stain, and streaks, and extrusion die lines or other extrusion streaks/lines.
 - d. Coated surfaces shall be uniform in thickness and color, smooth and free from blemishes in the coating that might impair the serviceability or detract from the general appearance of the member when viewed from 5 feet away, and shall match the approved samples.
 - e. Finish shall match in gloss, and fall within the color range of the approved Samples.
 - f. Material may not be finished more than once and material that has been finished and is not acceptable shall be scrapped.
 - g. Aluminum that does not receive an organic coating (concealed surfaces) shall receive an Alodine conversion coating as a minimum. No mill finish aluminum is acceptable.
 - h. Finish after fabrication.
 3. Completely cover surfaces to be painted to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Painted surfaces with cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness and other imperfections will not be acceptable.
 4. The TJPA Representative will have final authority to accept or reject material not meeting these finishing standards or other requirements of the Specification.
 5. Coatings which do not comply with Specification requirements or do not match approved samples shall be stripped and re-coated, or the Contractor shall furnish new material with the required coating.
- D. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.
- E. Stainless Steel:
1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
 2. Finish:
 - a. Finish exposed surfaces with a NAAMM No. 4 satin uniform finish, free of scratches and matching approved Samples.
 - b. When finishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 3. Concealed Surfaces: Bright, Cold-Rolled, Unpolished Finish: No. 2B.

4. Protection: After finishing protect panels with an electrostatically-applied plastic film.

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2.10 CLAY PANEL CLADDING (W-21)

- A. 3 . . . Clay Panel Cladding (Terra Cotta) complete with extruded clay panels, 1-5/8" thick minimum with prefinished blacked-out 6105 T5 aluminum track and clip support system with semi-rigid insulation (blacked-out), WPM, metal pan and structural studs to create a complete ~~assembly~~ **assembly**. Basis of Design TerraClad TM by Boston Valley Terra Cotta USA (www.bostonvalley.com) or NBK Terrart TerraCotta Systems or Telling LTD or equal. . . . 3
- B. Provide colored silicone gaskets, isolators, aluminum and stainless steel anchors, stainless steel 300 series fasteners and flashings and required accessories for complete installation. Provide concealed fasteners.
- C. Assembly shall be designed as a rain-screen system allowing for a pressure equalized airspace drained to the exterior.
- D. Clay panels shall be flat with no noticeable ways buckling, deflection, or other surface irregularities within manufacturer's tolerance.
- E. Clay Panel Type:
 1. Finish: Standard finish.
 2. Size: To various panel sizes as shown on drawings.
 3. Color: Clay panels shall be Salmon, Sand and Terracotta colors by Boston Valley standard color chart.
 4. Properties/Characteristics/Dimensions and Tolerances: Per Boston Valley Technical Date or better.
- F. Touch-up Material:
 1. As furnished and commended by the clay panel manufacturer. 1

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates, apply primers and install the work of this Section, including components, and accessories in accordance with the manufacturer's instructions, when available, except where more stringent requirements are shown or specified, and where project conditions require extra precautions or provisions to ensure satisfactory performance of the Work.
- B. Precautions: Caution all trades to refrain from cutting, burning, welding and grinding around adjacent to "finish" materials, including concrete.

3.2 EXAMINATION

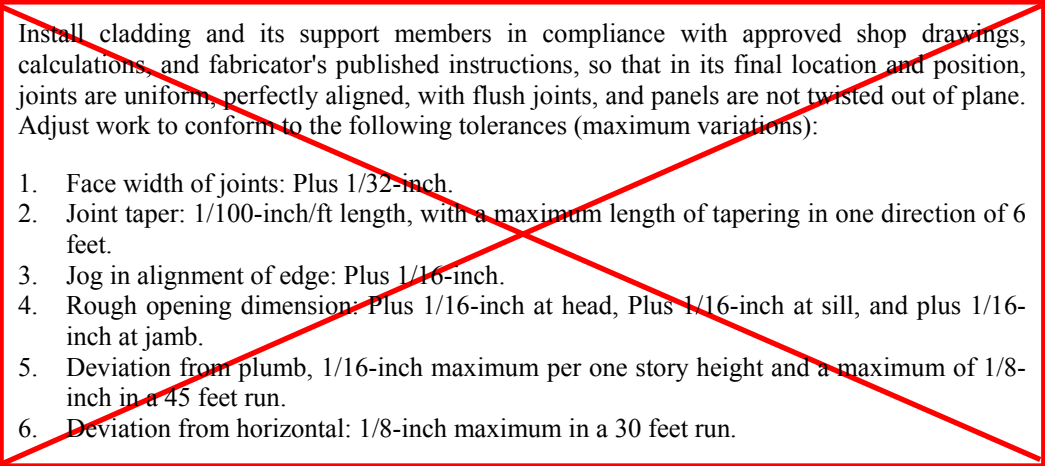
- A. Verification of Conditions:
 1. Verify actual site dimensions and location of adjacent materials prior to commencing work.
 2. Examine structure that will support the cladding. Verify elevation, tolerances, embeds, offset lines, and other conditions, which would affect the satisfactory installation and performance of the panels.

- B. Notification: Notify General Contractor in writing, with copy to TJPA Representative, of conditions detrimental to the installation.
- C. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.3 PREPARATION

- A. Examine supports to receive cladding. Make certain supports are secure and properly aligned (within acceptable tolerances) and prepared to receive cladding.
- B. 1 Do not begin installation of panels until the TJPA Representative accepts the secondary air/water barrier. 1
- C. Prepare surfaces to be in contact with cladding panels and panel surfaces in compliance with materials manufacturers' recommendations and those of cladding fabricator prior to installation of panels.

3.4 INSTALLATION

- A. 
 1. Face width of joints: Plus 1/32-inch.
 2. Joint taper: 1/100-inch/ft length, with a maximum length of tapering in one direction of 6 feet.
 3. Jog in alignment of edge: Plus 1/16-inch.
 4. Rough opening dimension: Plus 1/16-inch at head, Plus 1/16-inch at sill, and plus 1/16-inch at jamb.
 5. Deviation from plumb, 1/16-inch maximum per one story height and a maximum of 1/8-inch in a 45 feet run.
 6. Deviation from horizontal: 1/8-inch maximum in a 30 feet run.
- B. Anchorage and Movements:
 1. Provide slotted connections in anchors to allow for contraction/expansion, structural and seismic movements and the like.
 2. Peen all threads to prevent loosening.
- C. Green Screen Assembly (W-17):

A. The curtain wall shall be designed to accommodate these tolerances. Provided irregularities do not exceed them, and clearances shown on approved shop drawings are maintained, all parts of the curtain wall, when completed, shall be within the following tolerances:

1. Maximum variation from plane or location shown on approved shop drawings: 3 mm per 3600 mm (1/8 in per 12 ft) of length or 12 mm (1/2 in) in any total length.

2. Maximum offset from true alignment between two identical members abutting end to end in line: 1.5 mm (1/16 in).

1. 1 Supply and install Green Screen panel system or equal using component sizes of 48 inches by 168 inches where possible and order custom sections pre-made to make-up dimension to cover elevations without cutting material on site.
2. Provide 3 inches thick mesh assembly hot dipped galvanized with factory painted system with gage as recommended by manufacturer but no less than 12 gage. 1
3. Provide with top and side channel trim edge No.5104 and with bottom edge trim of No.5105.
4. Provide adjustable mounting stand-off clips capable of supporting assembly up to 6" from support wall No.51326. Order clips capable of fitting into corrugated W-19 profile recessed area.
5. Complete assembly to be hot dipped galvanized and painted colors selected by TJPA representative.
6. Attach to W-19 base wall Z girts with 304 stainless steel fasteners and washers using tamperproof fasteners.

D. Wall Installation (W-19):

1. Install structural stud partitions with isolation of sill tracks with damproof membrane.
2. Provide framing that can accept structural and seismic movements.
3. Provide deflection allowance joints with closed cell rods and double membranes. Complete same at building corners in membrane installation for racking movement.
4. Attach back-pan to studs allowing for seismic racking and movements.
5. Fully adhere WPM to back-pan and seal penetrations from aluminum "Z" girts, clips and the like lap joints 6 inches minimum.
6. Install with stick clips and mechanically fasten with type 304 stainless steel fasteners.
7. Attach panels in a method that will allow for movement due to structural movement and seismic racking.
8. Seal joints with rainscreen sealant and backing rods.
9. Install W-17 Trellis System Assembly through the W-19 assembly and fasten to "Z" girts in cavity using type 304 stainless steel fasteners.

E. Wall Installation W-16A and W-16B: Similar to W-19.

F. W-16A Aluminum Ceilings

1. Design supply and install 1/8" thick reinforced prefinished aluminium ceiling assembly complete with reveal joints, hot dipped galvanized suspension system anchored with hot dipped galvanized expansion type fastener and or as required by Authorities Having Jurisdiction.
2. Attach aluminum panels with 304 stainless steel pre-painted concealed flush fasteners isolating for dissimilar metals.
3. Provide aluminum reveal closures within panels and at perimeter interfaces with adjacent materials as shown on drawing.
4. For seismic design requirements refer to sheets A-0033 and A-0034

3...

G. **W-16C Break-Formed Reinforced Aluminum Cladding**

1. **Design, furnish and install break-formed 1/8-inch thick reinforced aluminum cladding complete with reveals, aluminum support framing, stiffeners, clips, and reinforced 20 gauge aluminum backing for waterproofing membrane specified in Division 07 to clad areas as indicated on the Drawings. Back-cut corners to provide sharp edges.**
2. **Attach aluminum panels with 304 stainless steel pre-painted concealed flush fasteners isolating for dissimilar metals.**
3. **Provide back pans and base flashings at spandrel and where required to support the waterproof membrane: 20-gage sheet reinforced as required and fully sealed.**
4. **Provide aluminum reveal closures within panels and at perimeter interfaces with adjacent materials as shown on drawing.**
5. **Seal all joints ~~with greenscreen type sealant.~~ ... 3**

3.5 SEALANTS

- A. Comply with the requirements of Section 07 92 00 for sealants, backer rods, and their installation.

3.6 ALUMINUM LOUVER IN WALLS:

- A. See Section 08 91 00 Wall Louvers for louvers.

3.7 1 CLAY PANEL CLADDING ASSEMBLY (W-21)

- A. Do not install broken, chipped or cracked units.
- B. Apply coat of bituminous paint on concealed aluminum surfaces to be in contact with steel, cementitious, and dissimilar materials.
- C. Install clay panel cladding system to wall assembly with open joints, pressure equalized, vented and drained and flashed cavity specified in accordance with the approved shop drawings and manufacturer's instructions.
- D. Fasten support assembly through to structural studs using sealed stainless steel through bolts and nuts. Seal all fasteners penetrating metal pan and water proofing membrane. Install semi-rigid insulation and black-out insulation at joint locations.
- E. Conceal fasteners.
- F. Place clay panel units in stack bond to lines and levels, plumb, with uniform, parallel joints, in accordance with their manufacturer's instructions.
 - 1. Use caution to prevent damage to clay panel units.
 - 2. When field-cutting, use caution to ensure that cuttings do not remain on exposed surfaces. Cut edges shall be sharp, without spalling.
 - 3. Cutting shall be performed with a diamond tipped wet saw.
 - 4. Ensure damaged panels can be easily replaced from the exterior and provide instructions for panel replacement procedure.
- G. Ensure that assembly is plumb, level and free of warp or twist; maintain dimensional tolerances and alignment with adjacent work.
- H. Built-in work:
 - 1. As work progresses, build in flashing and other items.
 - 2. Where applicable, remove protective film from finished aluminum surfaces.
- I. Tolerances: Accurately align and locate components to column lines and floor levels; adjust work to conform to the following tolerances.
 - 1. Plumb: 1/8-inch in 10 feet; 1/4-inch in 40 feet; non-cumulative.
 - 2. Level: 1/8-inch in 20 feet; 1/4-inch in 40 feet; non-cumulative.
 - 3. Alignment: Limit offset to 1/16-inch where surfaces are flush or less than 1/2-inch out of flush, and separated by less than 2 inches (by reveal or protruding work); otherwise limit offsets to 1/8 inch.
 - 4. Location: 3/8-inch maximum deviation from measured theoretical location (any member, and location).
 - 5. Lipping between units: 1/16 inch maximum.
- J. Touch-up paint between joints to conceal materials in cavity where necessary.

3.8 CLEANING OF CLAY PANEL CLADDING

- A. Clean soiled surfaces using materials which will not harm clay panel units or adjacent materials, as recommended by the clay panel manufacturer (clean with mild detergent using a natural bristle brush, starting from top of building to the bottom). Use non-metallic tools in cleaning operations. Pressure washer not to exceed 1200 psi.

- B. Upon completion of installation, remove protective coatings or coverings and clean aluminum surfaces, exercising care to avoid damage of finish.
- C. Remove excess sealant compounds, dirt or other foreign substances.
- D. Remove and replace clay panel units that are broken, chipped, cracked, abraded or damaged during construction period. Reinstall in accordance with their manufacturer's instructions.

3.9 SITE QUALITY CONTROL

- A. Field Water Testing:
 1. A testing agency, employed by the Contractor, shall perform field water tests in accordance with AAMA 503 on portions of the completed assemblies, at a minimum differential pressure of 10 psf.
 2. The number of tests will depend on the success or failure of the first and subsequent tests, but in any case shall not be less than 3.
 3. Test agency will report test results promptly and in writing to Contractor and TJPA Representative.

3.10 TJPA MONITORING ACTIVITIES

- A. TJPA's Testing Laboratory: A testing laboratory, engaged at the TJPA's expense, shall perform the following activities to monitor the Contractor's Quality Control Program. The monitoring activities are at the TJPA's discretion and in no way relieves the Contractor of sole responsibility for maintaining the Quality Control Program.
- B. Structural Elements:
 1. Full-time inspection of field erection for 100 percent of structural elements.
 2. Examination surveys of the superstructure substrates and supports to receive the assemblies and applicable corrective work performed, if any. Verification that the supporting structure is properly aligned and within the designed tolerances.
- C. Connections and Anchors: Verification that anchors are properly placed, welded or bolted. Verification that correct anchoring and/or materials are used in lieu of others where there are field changes. Inspection of welding and bolting where connections are stressed to 50 percent or more of allowable values. Verification of the calibration of wrenches, review of bolting procedures and inspection of joint surfaces prior to bolting for all bolted connections related to the exterior enclosure. Verification of welder's license, qualifications and welding procedures for all welds related to the exterior enclosure. Verification of proper welding or bolting of reset connections.
- D. Qualification for Shop and Field Welding: Qualify the welding operators and welding procedures in accordance with AWS requirements for carbon and stainless steel, using the same types of equipment and welds to be used in the Work.
- E. Visual Inspection of Steel Erection: Perform full-time inspection of the field erection for 100 percent of the structural elements.
- F. Visual Inspection of Field Connections: Perform 100 percent visual inspection of bolted and welded connections in the Work. Examine the surfaces, size, quality and placement of each connection to verify installation in accordance with Contract Documents and actioned shop drawings. Measure 15 percent of welds, length and profile, selected at random.
- G. Testing of High-Strength Bolted Field Connections: Test with calibrated torque wrench at least 25 percent of the bolts in each connection, but not less than 2 bolts.

- H. Magnetic Particle Testing of shop and Field Welds: Test in accordance with ASTM E709 and not less than the following items.
1. 10 percent of shear plate fillet welds, selected at random, final pass only.
 2. 20 percent of continuity plate and gusset plate fillet welds, selected at random, final pass only.
 3. 100 percent of tension member fillet welds, e.g. hanger rod connections and other similar connections, root and final passes.
 4. 100 percent of partial penetration welds, e.g. built-up members and other similar members, root and final passes.
 5. 100 percent of built-up member fillet welds in zones of moment connections, root and final passes.
 6. 20 percent of other built-up member fillet welds, selected at random, final pass only.
 7. 10 percent of other miscellaneous fillet welds selected at random, final pass only.
- I. Ultrasonic Testing of shop and Field Welds: Test in accordance with AWS D1.1 and not less than 100 percent of full penetration welds.
- J. Testing of Stud Welds: Perform 100 percent visual inspection of studs. Conduct standard in-place shear stud bend test on 20 percent of the studs, selected at random, and a minimum of 2 studs per erected member, in accordance with AWS D 1.1 requirements.
- K. Joints and Sealants: Verification that horizontal and vertical movement joints have been provided, and verification that joints are free from obstructions. Confirmation that accepted sealant materials are provided. Verification that sealant joints are properly sealed, and that the materials possess sufficient elongation capacity for movement anticipated. The recording of unanticipated movement or displacement beyond performance criteria.

3.11 CLEANING AND PROTECTING (GENERAL)

- A. General:
1. When installation is complete, clean the work of marks and other foreign substances.
 2. Protect work against stains and damages acceptance until acceptance by TJPA.
 3. Leave protective coatings or films on panels in place as long as possible where doing so will not produce discoloration or other undesirable visual defects.
 4. Remove protective coatings or films when, and in the manner, recommended by materials manufacturers published instructions.
 5. Clean panels in accordance with the material manufacturers' published recommendations.
- B. Remove and replace components damaged for any reason, including damage caused by other trades. Remove damaged materials promptly from the site. Replace damaged material with new undamaged materials approved by the TJPA Representative.
- C. Protect installed systems from damage.
1. Provide protection material recommended by the assembly manufacturer for the intended protection application and protection period.
 2. Install protection material so that will not trap harmful moisture or otherwise contaminate the installed work.
 3. Remove plastic protection sheeting on metalwork after installation.
- D. Acceptance of the completed installation requires that the installation be sound, watertight, and free from defects in materials and workmanship.

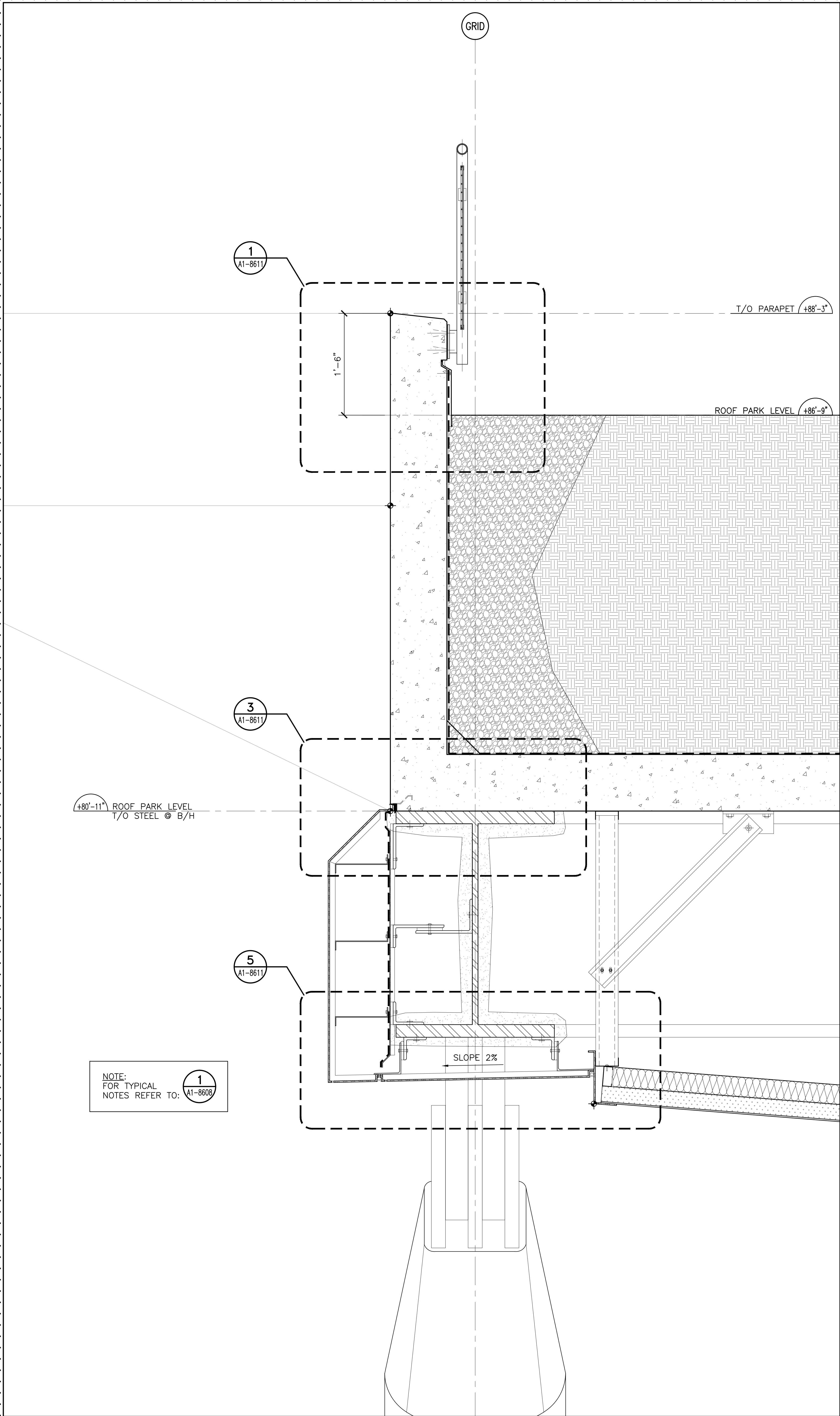
- E. Clean work periodically to avoid damage by accumulation of foreign materials, including bird droppings, and immediately prior to completion:
1. Clean surfaces in accordance with recommendations of each specific product manufacturers.
 2. Conduct cleaning operation from topmost levels down to avoid staining of cleaned surfaces from cleaning solution residue and run-off.
- F. Touchup and Repair: For damaged and field-welded metal coated surfaces, clean welds, bolted connections and abraded areas.
1. For factory-applied finishes, applicator shall be responsible for field-touchup for up to one percent of the surface area at no additional expense to the TJPA.
 2. Provide touchup so repair is invisible, under normal lighting conditions, from a distance of 2 feet.
 3. Touchup damage to zinc coating in the field with zinc cold galvanizing to protect the exposed steel.
- G. Protect panels from damage. Repair or replace damaged panels to the TJPA Representative's satisfaction.
- 3.12 ACCEPTANCE
- A. Each and every cladding panel will be subject to the TJPA Representative's approval or rejection.
- B. Panel or panels may be rejected after installation.
- C. Carefully remove rejected panels and replace with new panels without delay and without cost to the TJPA.
- D. 1 Remove panel or panels damaged in the removal of defective or rejected panels, and replace with new panels.

END OF SECTION 07 42 13

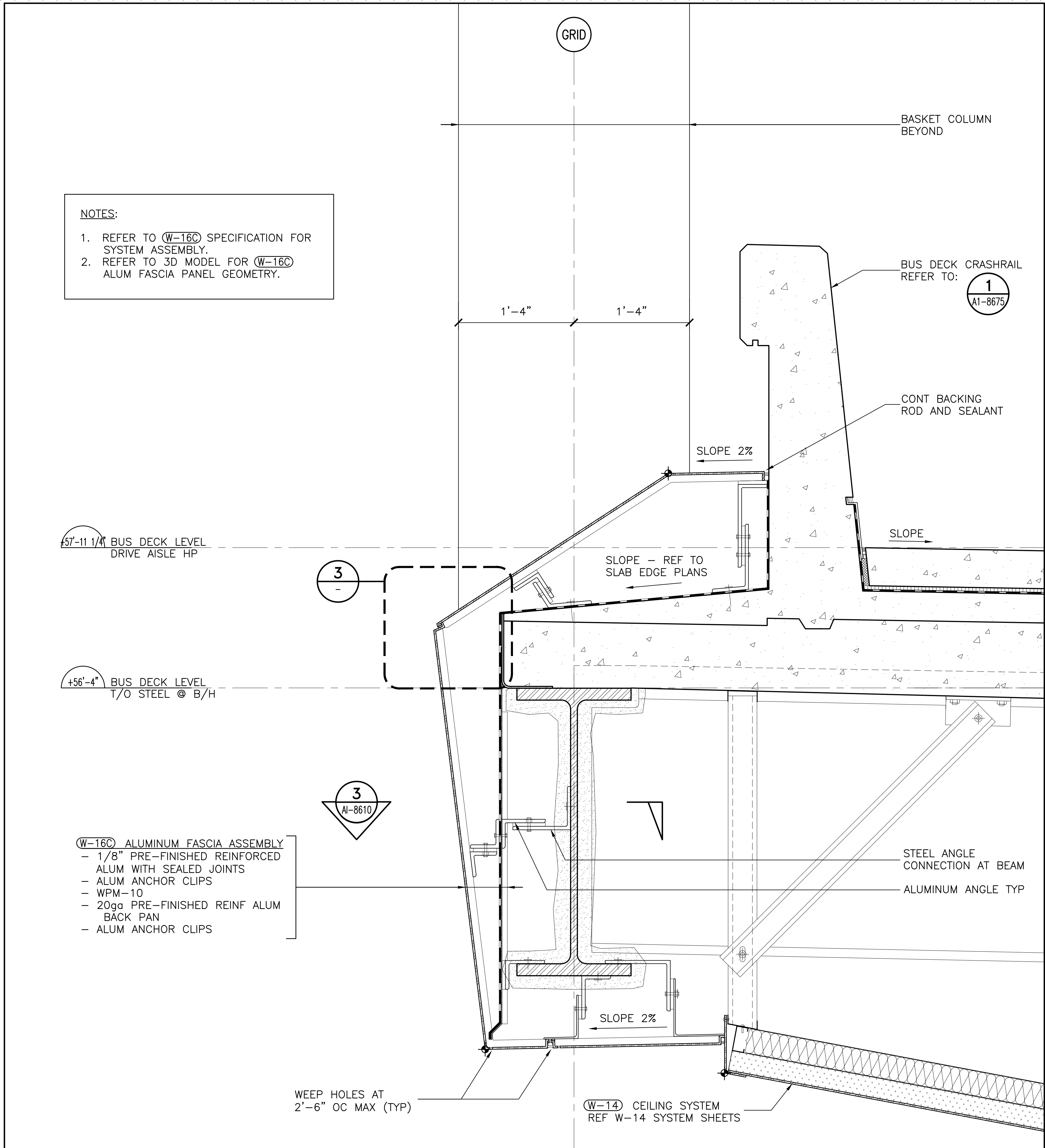
SPECIFICATION ISSUE LOG

Revision	Date
0	03/31/14
1	05/30/14
2	09/12/14
3	12/16/14

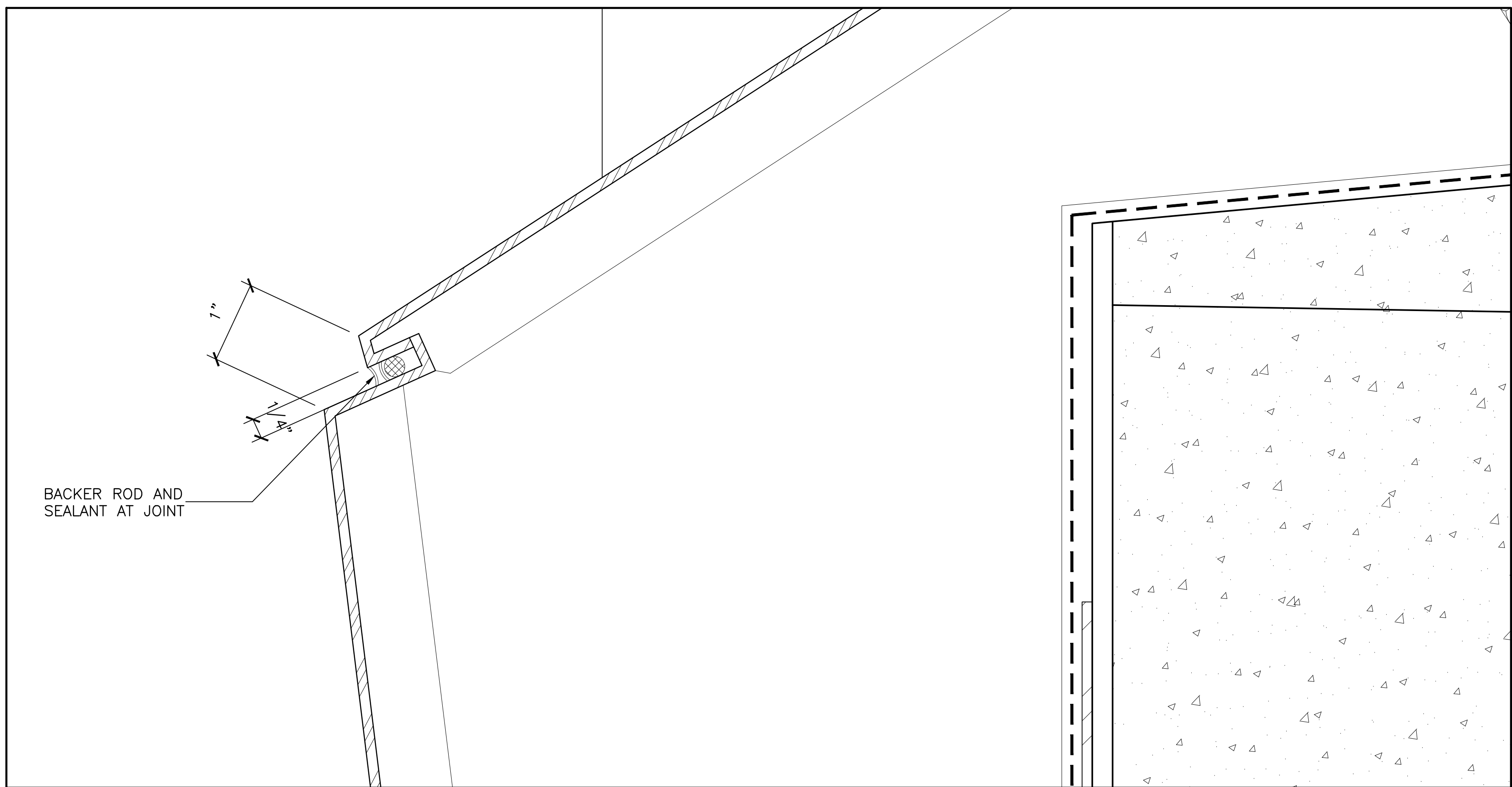
Note: If this sheet is not 44" x 34", it has been revised from its original size. Scales noted on drawings/details are no longer applicable.



1 TYPICAL CONC PARAPET AND W-16C FASCIA PANEL AT ROOF DECK
SCALE: 1-1/2" = 1'-0"



2 SECTION - W-16C TYPICAL ALUM FASCIA PANEL AND GUARDRAIL AT BUS DECK
SCALE: 1-1/2" = 1'-0"



3 PLAN - W-16C ALUM FASCIA PANEL JOINT DETAIL
SCALE: 3" = 1'-0"



Transbay T Logo.jpg

TRANSBAY JOINT POWERS AUTHORITY

CONSULTANT:
Pelli Clarke Pelli Architects
adamson
ASSOCIATES, INC.

01	02	03	04	05	06	07	08
09	10	11	12	13	14	15	16

Key Map
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NO.	DATE	ISSUED FOR CONSTRUCTION	DESCRIPTION
1	03/21/14	12/16/14	PER A2 No. 0728

08-04-CMGC-000

TRANSBAY TRANSIT CENTER PROGRAM
TRANSBAY TRANSIT CENTER
SAN FRANCISCO, CA

ALUM FASCIA (W-16C) &
ROOF PARK CONCRETE PARAPET
SYSTEM DETAILS

CONTRACT NO.

ARCHITECT/ENGINEER SEAL

NOT FOR CONSTRUCTION

APPROVED:
PRINCIPAL ARCHITECT
PROJECT MANAGER
DESIGNED BY:
E. DEL ANGEL
DRAWN BY:
S. SCHOPIS
SCALE:
AS NOTED
SHEET NUMBER

APPROVED:
G. METZGER
S. ROTT
E. DEL ANGEL
CHECKED BY:
W.R. BRADLEY
DATE:
12/16/2014
FACILITY NO.
140
REVISION
1
SEQUENCE NUMBER

SKA-4476 of