

Exhibit C - Technical Specifications

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Erosion and Sediment Control Measures.

1.02 RELATED SECTIONS

- A. Section 015700 – Temporary Controls

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Catch Basin Insert product data.

1.05 QUALITY ASSURANCE

- A. The Owner will provide weekly inspections of the installed erosion control measures to ensure they're functioning properly. The contractor shall repair any deficiencies within 24 hours of being made aware.

PART 2 PRODUCTS

2.01 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

- A. Storm Drain Inlet (Catch Basin) Protection: Storm drain inlet protection shall conform to the details shown on the Drawings. Geotextile fabric shall meet the requirements of the WSDOT Standard Specifications Table 1 for moderate survivability, and the minimum filtration properties of Table 2, in Section 9-33.2.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site to confirm location of erosion control measures as shown on the drawings will prevent sediment laden runoff from leaving the site.

3.02 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES INSTALLATION

- A. Storm Drain Inlet Protection: Install catch basin inserts per manufacturer's instructions. Inserts shall be installed where shown on the plans.

3.03 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAINTENANCE

- A. Maintenance required due to improper installation shall be fixed by the Contractor at no additional cost to the Owner.
- B. All erosion and sediment control measures shall be maintained by the Contractor for the life of the project. Any labor and equipment required to maintain the functionality of the TESC measures for the life of the contract shall be the responsibility of the Contractor.

- C. Sawcutting shall be done with water to prevent dust and the resulting slurry is to be vacuumed up immediately.
- D. Access to the site shall be from the existing property entrance off of Hooker Road. Construction traffic shall be limited to existing paved surfaces to the greatest extent feasible to prevent trackout from the site. Any trackout onto public roadways shall be cleaned up immediately.

End of Section 01 57 13

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Foundation
- B. Barrier Curb and Curb & Gutter

1.02 RELATED SECTIONS

- A. Section 321216 – Asphalt Paving

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).
- B. Washington State Department of Transportation (WSDOT) Standard Plans.

1.04 SUBMITTALS

- A. Product data for materials and items including reinforcement and forming accessories, admixtures, jointing systems, curing compounds, finish materials, and others requested by the Engineer.

1.05 QUALITY ASSURANCE

- A. Contractor shall have a minimum of five years of experience specializing in constructing concrete sidewalk, curbing and pavement and must be willing to provide past performance references if requested by the Engineer.

PART 2 PRODUCTS**2.01 GENERAL**

- A. Concrete materials shall be in accordance with Section 5-05.2 of the WSDOT Standard Specifications and as detailed below.
- B. All concrete shall be batched in a prequalified plant as described in Section 6-02.3(4)A and of the WSDOT Standard Specifications.
- C. Admixtures for concrete shall comply with Section 9-23.6 of the WSDOT Standard Specifications.
- D. Concrete curing compound shall comply with Section 9-23.2 of the WSDOT Standard Specifications

2.02 BUILDING FOUNDATION

- A. Concrete mix shall be in accordance with Section 6-02.3(1) of the WSDOT Standard Specifications, Commercial Concrete. Minimum cementitious content shall be not less than 470 pounds per cubic yard.

2.03 CONCRETE BARRIER CURB AND CURB AND GUTTER

- A. Concrete mix shall be in accordance with Section 8-04.3(1) of the WSDOT Standard Specifications.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Carefully investigate site condition and confirm that grading is to the correct elevation. The foundation under the concrete shall be shaped and compacted to a firm even surface conforming to the section shown in the Plans. All soft and yielding material shall be removed and replaced with acceptable material.

3.02 PREPARATION

- A. Set up temporary construction stakes and string lines off of installed survey hubs.

3.03 CONCRETE BARRIER CURB AND CURB AND GUTTER

- A. Construct concrete curb to the dimensions shown in the drawings.
- B. Concrete curbs shall be constructed in accordance with Section 8-04.3(1) of the WSDOT Standard Specifications.

3.04 BUILDING FOUNDATION

- A. Construct building foundation in accordance with the approved project plans.

End of Section 03 30 00

PART 1 - GENERAL**1.01 SECTION INCLUDES**

- A. Section Includes: Manufactured stone veneer, thin brick and architectural trim products.

1.02 RELATED SECTIONS

- A. Section 03 30 00 - Cast-In-Place Concrete
- B. Section 04 20 00 - Masonry Units
- C. Section 04 71 00 - Thin Brick Masonry Veneer
- D. Section 06 10 00 - Rough Carpentry
- E. Section 06 11 20 - Framing and Sheathing
- F. Section 07 62 00 - Sheet Metal Flashing & Trim

1.03 REFERENCES

- A. ASTM C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- B. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
- C. ASTM C 177 - Standard Test Method for Steady-State Head Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
- D. ASTM C 190 - Method of Test for Tensile Strength of Hydraulic Cement Mortars
- E. ASTM C 192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
- F. ASTM C 482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
- G. ASTM C 567 - Standard Test Method for Determining Density of Structural Lightweight Concrete
- H. ASTM C 1329 - Standard Specification for Portland Cement
- I. ASTM C 1670 - Standard Specification for Adhered Manufactured Stone Masonry Veneer Units.
- J. ASTM C 1780 - Standard Practice for Installation Methods for Adhered Manufactured Stone Masonry Veneer
- K. ICC AC 38 Acceptance Criteria for Water Resistive Barriers
- L. ICC ESR 2598 Coronado Stone Products Evaluation Report
- M. LEED: US Green Building Council's Leadership in Energy and Environmental Design Green Building Rating System
- N. Texas Department of Insurance: Product Evaluation - EC101
- O. UBC Standard No. 14-1, Kraft Waterproof Building Paper

1.04 SUBMITTALS

- A. Product Data: Manufacturer's specification and data sheets for each product used, including:
 - 1. Preparation instructions.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation guidelines.
 - 4. Cleaning and maintenance methods.
- B. Shop Drawings: Submit elevations and cross-section details showing proper installation methods.
- C. Sample Selection
 - 1. Standard sample board with selected stone profile and color should be submitted for each product specification.
 - 2. Selection of approved grout colors and styles (if applicable).

- D. Sample Verification: A field panel sample with the minimum size of 3' x 3' should be installed for every product selection showing: styles, colors, textures and grout colors.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Closeout Submittals: Provide manufacturer's warranty and maintenance recommendations.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Coronado Stone Products
- B. Installer Qualifications: Minimum 5 years experience with similar scope of work and must be able to furnish list of previous jobs and references if requested by Architect.
- C. Certifications: Products approved by ICC-ES Evaluation Service.
- D. Mock-Up: Provide field panel sample to evaluate preparation and application techniques.
- G. Pre-Installation Conference: Conduct a pre-installation meeting to verify all products, application methods, site conditions and warranty terms no less than thirty days prior to stone veneer installation.

1.06 DELIVERY, STORAGE & HANDLING

- A. Coordination of on-site delivery and storage should be arranged in advance to avoid work delays.
- B. Store and handle stone products in accordance with the manufacturer's recommendations.
- C. All material stored on-site should be protected from the elements before and during the installation process. Store material under cover and in a dry location.
- D. Store mortar, sealant and other installation material in compliance with the manufacturer's recommendations.

1.7 PROJECT CONDITIONS

- A. Maintain manufacturer's recommended environmental conditions to ensure optimum results.
- B. Cold Weather Requirements: Installations should be performed in temperatures exceeding 40 degrees Fahrenheit prior to, during and for 48 hours after completion of work. If temperatures are below 40 degrees Fahrenheit, masons should use heaters and tents during the installation process to regulate temperature.
- C. Hot Weather Requirements: If temperatures exceed 90 degrees Fahrenheit during the installation, additional moisture will need to be added to the backs of the stone veneer and scratch coated surface. Shade and/or frequent misting of the wall and stone may be required.

1.8 WARRANTY

- A. Provide manufacturer's 50 year limited warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: **Coronado Stone Products** (Corporate Office), which is located at: 11191 Calabash Ave, Fontana, CA 92337; Toll Free Tel: 800-847-8663; Fax: 909-357-7362; Email: sales@coronado.com; Web: **www.Coronado.com**
- B. Substitutions: Engineer approved equal

2.2 MATERIALS

- A. Manufactured Stone Veneer:
 - 1. Profile / Color: Hill Country Limestone - Bandera
- B. Manufactured Stone Veneer - Properties: Units consisting of Portland cement, lightweight aggregates and oxide pigments.
 - 1. Compressive Strength: Tested in accordance with ASTM C39 and ASTM C192, greater than 1800 psi.
 - 2. Shear Bond Test: Tested in accordance with ASTM C482, greater than 50 psi.
 - 3. Water Absorption: Tested in accordance with section 3.1.4 and 4.6 of ICC-ES AC51.
 - 4. Freeze / Thaw: Tested in accordance with ASTM C67, less than 3% mass loss.
 - 5. Unit Weight: Shipping weight is less than 15 lbs. per sq ft, density is determined in accordance with ASTM C567.

PART 3 – EXECUTION**3.1 EXAMINATION**

- A. Do not begin the installation process until substrates have been properly prepared.
- B. Notify architect of any unsatisfactory preparation of substrate before proceeding.
- C. Correct all unsatisfactory substrate conditions before installation begins.
- D. Verify roofs use proper water displacement methods to direct moisture away from the installed stone veneer.
- E. If substrate surface is questionable, bonding tests should be performed before installation to assess adhesion and confirm proper bonding strength.
- F. Flashing must be installed at wall penetrations and terminations of the stone veneer. Assure that all flashing and kickouts are corrosion resistant, integrated with the WRB properly (when used), and installed in accordance with the local building code requirements.

3.2 PREPARATION

- A. Clean all surfaces thoroughly prior to installation.
- B. Use manufacturer surface preparation recommendations to achieve best result.

3.3 INSTALLATION

- A. Product should be pulled from a variety of boxes and blended on site during installation to ensure a consistent overall project color on the wall.
- B. Install in accordance with manufacturer's installation instructions. Visit this page for detailed installation instructions - <https://www.coronado.com/InstallationGuide>
- C. Application details and mortar recommendations may vary depending on the stone style. Consult manufacturer for proper installation instructions.
- D. All dry-stacked and large format standard stones should be installed using a polymer-modified mortar meeting ANSI A118.4 or ANSI 118.15.
- E. All Classic Series and WoodStone products must be applied with a polymer-modified thinset bonding mortar.
- F. All applications in freeze-thaw environments require a polymer-modified mortar.

3.4 CLEANING AND PROTECTION

- A. Installed manufactured stone veneer can be cleaned with a mild soap and water solution.
- B. Cleaning efflorescence can be done by lightly scrubbing the face of the stone with a soft bristle brush and water. In some cases, a 25% vinegar 75% water solution may need to be used. Do not use any harsh cleaning methods to remove efflorescence.
- C. Touch-up, repair or replace damaged stone before completion of project.
- D. Water repellents and enhancers can be used to further protect a finished project. Only breathable, penetrating water-based silane water repellents should be used.

End of Section 04 73 00

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Structural dimension lumber framing.
- B. Sheathing.
- C. Preservative treated wood materials.
- D. Miscellaneous framing and sheathing.
- E. Communications and electrical room mounting boards.
- F. Concealed wood blocking, nailers, and supports.
- G. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

- A. Section 06173 – Plate Connected Wood Trusses.
- B. Section 09260 – Gypsum Board Assemblies: Gypsum-based exterior sheathing.

1.03 REFERENCE STANDARDS

- A. ASTM A 153/A 153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- B. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
- C. AWPA C2 – Lumber, Timber, Bridge Ties and Mine Ties – Preservative Treatment by Pressure Processes; American Wood Protection Association; 2003
- D. AWPA U1 – Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2007
- E. PS 20 – American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- F. WCLIB (GR) – Standard Grading Rules for West Coast Lumber No. 17; West Coast Lumber Inspection Bureau; 2004, and supplements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER

- A. Grading Agency: West Coast Lumber Inspection Bureau (WCLIB).
- B. Sizes: Nominal sizes as indicated on drawings.
- C. Moisture Content: MC-19
- D. All Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: K.D. D.F. #2 or better unless noted otherwise
 - 2. Sill Plates – P.T. H.F. #2 or better

2.03 ENGINEERED LUMBER

- A. Grading: per structural notes on plans
- B. Sizes: Nominal sizes as indicated on plans
- C. All Manufactures shall have current LCC-E5 Evaluation reports for products supplied

2.04 TIMBERS

- A. Grading Agency: West Coast Lumber Inspection Bureau (WCLIB).
- B. Sizes: Nominal sizes and grades as indicated on drawings, K.D. D.F. #2 or better
- C. Moisture content: MC-19

2.05 CONSTRUCTION PANELS

- A. Per drawings, and as follows, manufactured in conformance with IBC Standard 23-2.
- B. APA Rated Roof Sheathing: Exterior Exposure Class or Exposure Class 1, and as follows:
 - 1. Span Rating: Per Drawings.
 - 2. Span Rating: 24/0
- C. Wall Sheathing: APA PRP-108/APA PRP-108, Form B455 Structural Rated Sheathing, Exterior Exposure Class, and as follows:
 - 1. Span Rating: 24/0

2.06 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
- B. Water-Resistive Barrier: No. 15 asphalt felt.

2.07 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 – Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
 - 1. Kiln dry lumber after treatment to maximum moisture content of 9 percent.
 - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
 - 3. Treat lumber in contact with concrete.
 - 4. Treat lumber as noted on plans.
- C. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.4 lb/cu ft retention.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION – GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

- A. Refer to General Structural Notes on drawings.
- B. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- C. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- D. Install structural members full length without splices unless otherwise specifically detailed.
- E. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.
- F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fire blocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- E. Specifically, provide the following non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Chalkboards and marker boards.
 - 8. Wall paneling and trim.
 - 9. Joints of rigid wall coverings that occur between studs.

3.05 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.06 INSTALLATION OF CONSTRUCTION PANELS

- A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 - 1. Nail panels to framing; staples are not permitted.
- B. Wall Sheathing: Secure with long dimension perpendicular or parallel to wall studs, with ends over firm bearing and staggered, using nails. Staples are not permitted.
 - 1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.
- C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.

3.07 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

END OF SECTION

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Sheathing membrane for installation over sheathing
- B. Window sill pans
- C. Penetration flashing

1.02 REFERENCE

- A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Condition, and sections under Division 1 General Requirements.
- B. ASTM International
 - 1. ASTM C920; Standard Specification for Elastomeric Joint Sealants
 - 2. ASTM C1193; Standard Guide for Use of Joint Sealers
 - 3. ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - 4. ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
 - 5. ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
 - 6. ASTM E96; Test Method for Water Vapor Transmission of Materials
 - 7. ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - 8. ASTM E2178; Test method for Air Permeance of Building Materials
- C. AATCC – American Association of Textile Chemists and Colorists
 - 1. Test Method 127 Water Resistance: Hydrostatic Pressure Test
- D. TAPPI
 - 1. Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - 2. Test Method T-460; Air Resistance (Gurley Hill Method)

1.03 SUBMITTALS

- A. Refer to Division 1 for Submittal Procedures
- B. Product Data: Submit manufacturer current technical literature for each component.
- C. Samples: Weather Barrier Membrane, minimum 8 1/2" x 11"
- D. Quality Assurance Submittals
 - 1. Manufacturer Instructions: Provide manufacturer's written installation instructions.

1.04 QUALITY ASSURANCE

- A. Qualifications
 - 1. Installer shall have experience with installation of similar weather barrier assemblies under similar conditions.
 - 2. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
 - 3. Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store weather barrier materials as recommended by system manufacturer.

1.06 SCHEDULING

- A. Weather barrier to be installed prior to installation of doors, windows, louvers and flashings to provide weather-tight barrier assembly.

PART 2 PRODUCTS**2.01 MANUFACTURER**

- A. DuPont Building Innovations; 4417 Lancaster Pipe, Chestnut Run Plaza 721, Wilmington, DE 19805; or approved equal

2.02 MATERIALS

- A. Basis of Design: spunbonded polyolefin, non-woven, non-perforated, weather barrier is based upon DuPont Tyvek HomeWrap and related assembly components.
- B. Performance Characteristics:
 - 1. Air Penetration: <.004 cfm/ft² at 1.57 psf, when tested in accordance with ASTM E2178, Type I per ASTM E1677.
 - 2. Water Vapor Transmission: 56 perms, when tested in accordance with ASTM E96-05, Method A.
 - 3. Water Penetration Resistance: 250 cm when tested in accordance with ASTCC Test Method 127.
 - 4. Basis Weight: 1.8 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 - 5. Air Resistance: 1200 seconds, when tested in accordance with TAPPI Test Method T-460.
 - 6. Tensile Strength: 30/30 lbs/in., when tested in accordance with ASTM D882.
 - 7. Tear Resistance: 8/6 lbs, when tested in accordance with ASTM D1117.
 - 8. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 15, Smoke Developed: 15.

2.03 ACCESSORIES

- A. Seam Tape: 3 inch wide, DuPont Tyvek Tape as manufactured by DuPont Building Innovations.
- B. Fasteners:
 - 1. DuPont Tyvek Wrap Cap Screws, as manufactured by DuPont Building Innovations: 1-5/8" rust resistant screw with 2-inch diameter plastic cap or manufacture approved 1-1/4" or 2" metal gasketed washer

AND/OR

- 2. DuPont Tyvek Wrap Caps, as manufactured by DuPont Building Innovations: #4 nails with large 1-inch plastic cap fasteners.
- C. Sealants
 - 1. Provide sealants that comply with ASTM C920, elastomeric polymer sealant to maintain watertight conditions.
 - 2. Products:
 - a. DuPont Weatherization Sealant
 - b. Tremco 830
 - c. Tremco Butyl
 - d. Sealants recommended by the weather barrier manufacturer.

D. Flashing:

- 1. DuPont FlexWrap, as manufactured by DuPont Building Innovations: flexible membrane flashing materials for window openings and penetrations.

AND/OR

- 2. DuPont StraightFlash, as manufactured by DuPont Building Innovations: straight flashing membrane materials for flashing windows and doors and sealing penetrations, masonry ties, etc.

AND/OR

- 3. DuPont StraightFlash VF, as manufactured by DuPont Building Innovations: dual-sided, straight flashing membrane materials for brickmold and non-flanged windows and doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

3.02 INSTALLATION – WEATHER BARRIER

- A. Refer to manufacturer's instructions for installation of weather barrier. Provide installation instruction to owner prior to commencing work.

3.03 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal and tears or cuts as recommended by weather barrier manufacturer.

3.06 PROTECTION

- A. Protect installed weather barrier from damage.

END OF SECTION

PART 1 – GENERAL**1.01 SECTION INCLUDES**

The work includes, but is not necessarily limited to, furnishing and installation of all preformed metal roofing, and accessories as indicated on the drawings and specified herein.

1.02 RELATED SECTIONS

- A. Joint Sealants not specified herein: Section 079200

1.03 PERFORMANCE REQUIREMENTS**A. TESTING AND CERTIFICATION**

1. Wind Uplift:
 - a. The panel system shall be ASTM E1592 tested under the supervision of an accredited laboratory and the laboratory shall issue the test report.
 1. The testing laboratory shall meet the requirements for compliance with the ISO/IEC Standards 17025 or an accredited independent agency, recognized by the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement or ANSI.
 - b. UL 580 test, Class 90 rated per (select applicable construction):
 1. [Construction #364 minimum 24 gauge panels when installed over 5/8" plywood, with roof panel fastener clips spaced 2'-0" on center maximum.]
 2. [Construction #365 minimum 24 gauge panels when installed over minimum 16 gauge steel purlins, with roof panel fastener clips spaced 4'-0" on center maximum.]
 3. [Construction #366 minimum 24 gauge panels when installed over minimum 22 gauge steel deck, with roof panel fastener clips spaced 4'-0" on center maximum.]
2. Air Infiltration: Panel to meet the following standard when in accordance with ASTM E-1680:
 - a. With factory-applied continuous sealant 0.08 cfm/lineal ft. of panel seam at 1.57 psf positive pressure, and 0.13 cfm/lineal ft. of panel seam at 1.57 psf negative pressure.
3. Water Penetration: Panel to meet the following standard when tested in accordance with ASTM-E1646:
 - a. With factory-applied continuous sealant, no leakage at 6.24 psf.

1.04 SUBMITTALS**A. PRODUCT DATA**

1. Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing required. Include data substantiating that materials comply with requirements.

B. SAMPLES

1. Prior to ordering products, submit Manufacturer's standard color Samples for Architect's/Engineer's selection.
2. Prior to starting work, submit (quantity) 12" long Panel Samples showing shape and a representative color chip for Architect's/Engineer's acceptance.

C. SHOP DRAWINGS

1. Submit complete shop drawings detailing all perimeter flashings and joints in accordance with the manufacturer's standard recommendations.
2. Describe all proposed details that deviate from what is shown on the plans.
3. Details must allow for expansion and contraction.

1.05 QUALITY ASSURANCE

- A. INSTALLER'S QUALIFICATIONS
 - 1. Installer must be approved by the Panel Manufacturer in writing prior to work commencing.
 - 2. Installer shall meet the following:
 - a. Successfully applied five metal roofs of comparable size and complexity which reflects a quality weathertight installation.
 - b. Have been in business for a minimum period of five years in the region where the work will be performed.

- B. MANUFACTURER'S QUALIFICATIONS
 - 1. Manufacturer shall have a minimum of 10 years experience supplying metal roofing to the region where the work is to be done.
 - 2. Comply with current independent testing and certification as specified.
 - 3. Manufacturer shall provide proof of \$2,000,000 liability insurance for their metal roof system and comply with current independent testing and certification as specified.
 - 4. The roof panel manufacturer must also subscribe to Underwriters Laboratories' "Follow Up Service" assuring continuing product compliance with UL requirements. Shipment packaging of panels and attachment clips must bear UL classification markings.
 - 5. Panel manufacturers without full supporting literature; Flashings & Details Guides, Guide Specifications and Technical Support, shall not be considered equal to the specified product.

- C. REGULATORY AGENCY REQUIREMENTS
 - 1. Comply with UBC and local Building Code requirements if more restrictive than those specified herein.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect against damage and discoloration.
- B. Handle panels with non-marring slings.
- C. Do not bend panels.
- D. Store panels above ground, with one end elevated for drainage.
- E. Protect panels against standing water and condensation between adjacent surfaces.
- F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Painted panels shall be shipped with a protective plastic sheeting or a strippable film coating between all panels. [Remove any strippable film coating prior to installation and in any case, do not allow the strippable film coating to remain on the panels in extreme heat, cold, or direct sunlight or other UV source.]

1.07 PROJECT CONDITIONS

- A. Examine the conditions and substrates in which metal roofing work is to be installed. Substrate shall be installed level, flat and true to avoid panel stresses and distortion.
- B. Field measurements shall be taken prior to fabrication of panels.
- C. Proceed with roofing installation only after satisfactory conditions are met.

1.08 WARRANTY

- A. MANUFACTURER'S PRODUCT WARRANTY
 - 1. Manufacturer's standard performance warranty, as available for specified installation and environmental conditions.

- B. CONTRACTOR'S WARRANTY
 - 1. Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, to remain watertight and weatherproof with normal usage for two (2) years following Project Substantial Completion date.

PART 2 – PRODUCTS**2.01 ACCEPTABLE MANUFACTURER**

- A. AEP Span, A Division of ASC Profiles Inc, 2110 Enterprise Boulevard, West Sacramento, CA 95691
800-733-4955
Fontana: 10905 Beech Avenue, Fontana, California 92337
Tacoma: 2141 Milwaukee Way, Tacoma, Washington 98421
- B. Or approved equal.
- C. PANEL DESIGNATION: Design Span® *hp*
- D. ALTERNATES: To be approved as an equal system, submit or respond to all items in “Quality Assurance”, “Performance Requirements” and “Submittal “ sections of this specification.

2.02 MATERIALS**A. PANELS**

- 1. Base Metal:
 - a. Material: Steel conforming to:
 - (1) ASTM A792 minimum yield 50,000 psi, thickness 24 gauge.
 - b. Protective Coatings:
 - (1) Conform to ASTM A792, AZ50 (Zincalume®/Galvalume®).
- 2. Exterior Finish:
 - a. DuraTech® 5000 (Polyvinylidene Fluoride), full 70% Kynar® 500/Hylar 5000® consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 10-30% when tested in accordance with ASTM D-523 at 60°.
- 3. Interior Finish:
 - a. Primer Coat Material: Corrosion-resistant primer; primer coat dry film thickness: 0.15 mils; finish coat material: polyester paint, finish coat dry film thickness: 0.35 mils.
 - b. Color: Off-White to Light Gray
- 4. Color:
 - a. Custom color as selected by Owner to be **COOL ZINC GREY**.
- 5. Factory-Applied Seam Sealant:
 - a. Cold-applied, non-skinning, butyl mastic sealant.
- 6. Configuration:
 - a. Standing Seam: Roof panels shall consist of integral self-locking standing seams 1-3/4” high spaced 12” on center with striated pans.

B. ACCESSORIES

- 1. Fastener Clip:
 - a. UL 90 rated 18 gauge G-90 Galvanized steel, 40 ksi yield strength, 3-1/2” long triple fastener type.
- 2. Fasteners:
 - a. Per manufacturer’s recommendation.
- 3. Sealant:
 - a. Gunnable Grade Caulking: Single component polyurethane caulk.
 - b. Tape sealant: Butyl
- 4. Bearing Plate:

- a. 24 gauge 4"x6" Zinalume® coated steel bearing plate.

C. FLASHING

1. Material, gauge and finish to match panels. Do not use lead or copper.

D. FABRICATION

1. Unless otherwise shown on drawings or specified herein, fabricate panels in continuous one-piece lengths and fabricate flashings and accessories in longest practical lengths.
2. Roofing panels shall be factory formed. Field formed panels are not acceptable.

PART 3 – EXECUTION

3.01 EXAMINATION

A. EXISTING CONDITIONS

1. Verify that members to receive panels are complete, accurately sized and located, in true plane, secure and otherwise properly prepared.
2. Prior to starting work, notify General Contractor about any defects requiring correction.
3. Do not start work until conditions are satisfactory.

3.02 PREPARATION

A. FIELD MEASUREMENTS

1. Verify prior to fabrication.
2. If field measurements differ from drawing dimensions, notify Architect/Engineer prior to fabrication.

B. PROTECTION

1. Treat, or isolate with protective material, and contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
2. Require workmen who will be walking on Roofing Panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material which could cause damage or discoloration.
3. Protect Work of other Trades against damage and discoloration.

C. SURFACE PREPARATION

1. Clean and dry surfaces prior to applying sealant.

3.03 INSTALLATION

A. PANELS

1. Follow roof panel manufacturer's directions.
2. Install panel seams vertically.
3. Lap panels away from prevailing wind direction.
4. Do not stretch or compress panel side-lap.
5. Secure panels without warp or deflection.
6. Fully engage interlocking seams.
7. Remove strippable protective film, if used, immediately preceding panel installation.

B. ALLOWABLE ERECTION TOLERANCE

1. Maximum Alignment Variation: 1/4 inch in 40 feet

C. FLASHING

1. Follow Manufacturer's directions and Architect approved Shop Drawings.
2. Install flashings to allow for thermal movement.
3. Remove strippable protective film, if used, immediately preceding flashing installation.

D. CUTTING AND FITTING

1. Neat, square and true. Torch cutting is prohibited.
2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.
3. Debur cut edge where necessary to saw-cut panels.

3.04 CLEAN UP AND CLOSE OUT

A. PANEL DAMAGE AND FINISH SCRATCHES

1. Do not apply touch-up paint to damaged paint areas that involve minor scratches.
2. Panels or flashings that have severe paint and/or substrate damage shall be replaced as directed by the Architect's or Owner's representative.

B. CLEANING AND REPAIRING

1. At completion of each day's work and at work completion, sweep Panels, Flashings and Gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
2. Remove debris from Project Site upon work completion or sooner, if directed.

End of Section 07 41 13

BID ALTERNATE #1**PART 1 – GENERAL****1.01 SECTION INCLUDES**

The work includes, but is not necessarily limited to, furnishing and installation of all preformed metal roofing and walls, and accessories as indicated on the drawings and specified herein.

1.02 RELATED SECTIONS

- A. Joint Sealants not specified herein: Section 07900
- B. Finish Painting not specified herein: Section 09900

1.03 SUBMITTALS**A. PRODUCT DATA**

- 1. Submit Manufacturer's technical product data, installation instructions and recommendations for each type of roofing and wall panel required. Include data substantiating that materials comply with requirements.

A. SAMPLES

- 1. Prior to ordering products, submit Manufacturer's standard color Samples for Architect's/Engineer's selection.
- 2. Prior to starting work, submit (quantity) 12" long Panel Samples showing shape and a representative color chip for Architect's/Engineer's acceptance.

B. SHOP DRAWINGS

- 1. Show panel layout, trim installation, and panel attachment.

C. SITE CONDITIONS

- 1. Provide completed site condition form for the specified finish to suit project condition

1.04 QUALITY ASSURANCE**A. INSTALLER'S QUALIFICATIONS**

- 1. Installation of panels and accessories by installers with a minimum of 5 years experience on panel projects of this nature.

B. MANUFACTURER'S QUALIFICATIONS

- 1. Manufacturer shall have a minimum of 10 years experience supplying metal roofing/siding to the region where the work is to be done.
- 2. Panel manufacturers without full supporting literature, Flashings & Details Guides, Guide Specifications and Technical Support shall not be considered equal to the specified product.

C. REGULATORY AGENCY REQUIREMENTS

- 1. Comply with UBC and local Building Code requirements if more restrictive than those specified herein.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect against damage and discoloration

- B. Handle panels with non-marring slings.
- C. Do not bend panels.
- D. Store panels above ground, with one end elevated for drainage.
- E. Protect panels against standing water and condensation between adjacent surfaces.
- F. If panels become wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Remove any strippable film coating prior to installation and do not allow it to remain on the panels in extreme cold, heat or in direct sunlight.

1.06 WARRANTY

A. MANUFACTURER'S PRODUCT WARRANTY

- 1. Manufacturer's standard coating performance warranty, as available for specified installation and environmental conditions.

B. CONTRACTOR'S WARRANTY

- 1. Warrant panels, flashings, sealants, fasteners and accessories against defective materials and/or workmanship, to remain watertight and weatherproof with normal usage for two (2) years following Project Substantial Completion date.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. AEP Span, A Division of ASC Profiles Inc, 2110 Enterprise Boulevard, West Sacramento, Calif 95691
800-733-4955
Fontana: 10905 Beech Avenue, Fontana, California 92337
Tacoma: 2141 Milwaukee Way, Tacoma, Washington 98421
- B. Or approved equal.
- C. PANEL DESIGNATION:
 - 1. Mini-V-Beam. Net coverage 32", rib depth 1-3/8" @ 4-9/16" o.c.

2.02 MATERIALS

A. PANELS

- 1. Base Metal:
 - a. Material:
 - (1) Steel conforming to ASTM A792 Zincalume®/Galvalume®, minimum yield 50,000 psi, thickness 24 gauge.
 - b. Protective Coating:
 - (1) Conform to ASTM A792, AZ50 (Zincalume/Galvalume).
- 2. Exterior Finish: (choose one)
 - a. DuraTech® 5000 (Polyvinylidene Fluoride), full 70% Kynar® 500/Hylar 5000® consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 10-30% when tested in accordance with ASTM D-523- 89 at 60°.
- 4. Color:
 - a. Custom color as selected by Owner to be **COOL FOREST GREEN**.

B. FABRICATION

- 1. Unless otherwise shown on drawings or specified herein, panels shall be full length. Fabricate flashings and accessories in longest practical lengths.

2. Roofing panels shall be factory formed. Field formed panels are not acceptable.

PART 3 – EXECUTION

3.01 EXAMINATION

A. EXISTING CONDITIONS

1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions.

3.02 PREPARATION

A. FIELD MEASUREMENTS

1. Verify prior to fabrication.
2. If field measurements differ from drawing dimensions, notify Architect/Engineer prior to fabrication.

B. PROTECTION

1. Treat, or isolate with protective material, and contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
2. Require workmen who will be walking on Roofing Panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material, which could cause damage or discoloration.
3. Protect work of other trades against damage and discoloration.

C. SURFACE PREPARATION

1. Clean and dry surfaces prior to applying sealant.

3.03 INSTALLATION

A. PANELS

1. Follow roof panel manufacturer's directions.
2. Install panel seams horizontally.
3. Lap panels away from prevailing wind direction.
4. Do not stretch or compress panel side-laps.
5. Secure panels without warp or deflection.

B. ALLOWABLE ERECTION TOLERANCE

1. Maximum Alignment Variation: 1/4 inch in 40 feet.

C. FLASHING

2. Follow manufacturer's directions and architect approved Shop Drawings.
3. Install flashings to allow for thermal movement.
4. Remove strippable protective film, if used, immediately preceding flashing installation.

D. CUTTING AND FITTING

1. Neat, square and true. Torch cutting is prohibited where cut is exposed to final view.
2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.

3. Where necessary to saw-cut panels, debur cut edges.

3.04 CLEAN UP AND CLOSE OUT

A. PANEL DAMAGE AND FINISH SCRATCHES

1. Do not apply touch-up paint to damaged paint areas that involve minor scratches.
2. Panels or flashings that have severe paint and/or substrate damage shall be replaced as directed by the Architect's or Owner's representative.

B. CLEANING AND REPAIRING

1. At completion of each day's work and at work completion, sweep panels, flashings and gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
2. Remove debris from project site upon work completion or sooner, if directed.

End of Section 07 42 13

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Reglets and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 099100 – Joint Sealers.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2005.
- B. ASTM A 653/A 653M – Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2007.
- C. SMACNA (ASMM) – Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 SUBMITTALS

- A. See Section 01300 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Stack material to prevent twisting, bending, abrasion and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS**2.01 SHEET MATERIALS**

- A. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with PVDF coating.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from the manufacturer's standard colors.

2.02 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers. Color to match adjacent material.
- B. Underlayment: Grace Building Products, Grace Ice and WaterShield.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Zinc molybdate alkyd.

2.03 FABRICATION

- A. Form section true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with standing seam, except where otherwise indicated. At moving joints, use seal lapped bayonet-type or interlocking hooked seams.

1. Provide standing seam joint at all coping joints.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed and secure.

3.02 PREPARATION

- A. Coordinate installation with installation of metal wall panels and sheathing membrane.
- B. Install starter and edge strips, and cleats before starting installation.
- C. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- D. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Conform to drawing details and applicable SMACNA details.
- B. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

End of Section 07 62 00

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Sealants and joint backing.

1.02 REFERENCE STANDARDS

- A. ASTM C 834 – Standard Specification for Latex Sealants; 2005.
- B. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants; 2005.
- C. ASTM C 1193 – Standard Guide for Use of Joint Sealants; 2009.
- D. ASTM D 1667 – Standard Specification for Flexible Cellular Materials—Poly(Vinyl Chloride) Foam (Closed-Cell); 2005.

1.03 SUBMITTALS

- A. See Section 01300 – Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate penetration, limitations, and color availability.
- C. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.05 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.06 WARRANTY

- A. Correct defective work within a five year period after Date of Substantial Completion.
- B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS**2.01 SEALANTS**

- A. General Purpose Exterior Sealant: Acrylic, solvent release curing; ASTM C 920, Grade NS, Class 12-1/2, Uses M, G, and A; single or multi-component.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications: Use for:
 - a. Joints between concrete and other materials.
 - b. Joints between metal frames and other materials.
 - c. Other exterior joints for which no other sealant is indicated.
- B. Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
 - 1. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.
 - b. Concealed sealant bead in siding overlaps.
- C. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications: Use for:
 - a. Interior wall and ceiling joints
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.

2.02 ACCESSORIES

- A. Primer: Non-straining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with the manufacturer's instructions and ASTM C 1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with the sealants manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

END OF SECTION

PART 1 - GENERAL**1.01 SECTION INCLUDES**

- A. Standard insulated hollow metal doors and frames

1.02 RELATED SECTION

- A. Section 087100 - Door Hardware
- B. Section 099000 - Paints and Coatings

1.03 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.04 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings, 22 Gauge.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.05 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door design
 - 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, joints, field splices, and connections.
 - 7. Details of accessories.
 - 8. Details of moldings, removable stops, and glazing.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification:
 - 1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm.)
 - 2. For the following items, prepared on Samples about 12 by 12 inches (305 by 305 mm) to demonstrate compliance with requirements for quality of materials and construction:
 - a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
 - b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow metal panels and glazing if applicable.
- E. Other Action Submittals:
 - 1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.06 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and

Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to finish of factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 1. Provide minimum ¼-inch space between each stacked door to permit air circulation.

1.08 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.09 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.
 1. Lyndon or Equivalent

2.02 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008 M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.03 STANDARD HOLLOW METAL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.
 1. Design: As indicated on door schedule.
 2. Core Construction: Polystyrene, polyurethane, mineral-board, or vertical steel-stiffener core.
 3. Vertical Edges: Seamless, continuously welded, ground smooth with no putty, no filler.
 4. Top and Bottom Edges: Closed with flush or inverted 0.053-inch- (1.3-mm-) thick, end closures or channels of same material as face sheets.
 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level model and ANSI/SDI A250.4 for physical performance level:

1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 - Seamless, continuously welded, ground smooth, no putty, no filler.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- D. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.04 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
 1. Fabricate frames with mitered corners.
 2. Fabricate frames as full profile welded unless otherwise indicated.
 3. Frames for Level 2 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.05 FRAME ANCHORS

- A. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0mm) thick, and as follows:
 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.06 HOLLOW METAL PANELS

- A. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal work.

2.07 STOPS AND MOLDINGS

- A. Provide stops and molding around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
- B. Moldings for Glazed Lites in Doors: Provide fixed stops and moldings with no exposed fasteners on secure side of hollow metal work.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Use manufacturer's standard glazing bead.
- D. Loose Stops for Glazed Lites in Frames: Minimum 5.8 inch (16 mm) high, fabricated from manufacturer's standard glazing bead.
- E. Terminated Stops: Where indicated on interior door frames, terminate stops 6 inches (152mm) above finish floor with a 45-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
 1. Provide terminated stops where indicated.

2.08 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Ceiling Struts: Minimum ¼-inch-thick by 1-inch- (6.4-mm-thick by 25.4-mm-) wide steel.

2.09 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factor assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush and invisible.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 from top and bottom of frame. Space anchors not more than 32 inches O.C. and as follows:
 - i. Three anchors per jamb up to 60 inches high.
 - ii. Four anchors per jamb from 60 to 90 inches high.
 - iii. Five anchors per jamb from 90 to 96 inches high.
 - iv. Five anchors per jamb plus (1) additional anchor per jamb for each 24 inches or fractions thereof above 96 inches high.
 - v. Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.
 - b. Compression Type: Not less than two anchors in each jamb.
 - c. Post-installed Expansion Type: Locate anchors not more than (6) inches from top and bottom of frame. Space anchors not more than (26) inches O.C.
- D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Section 087100: Door Hardware
 - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 - 2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
 - 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparations of hollow metal work for hardware.
 - 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
- F. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with burred or mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings with no exposed fasteners on secure side of hollow metal work.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite are capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 4. Provide loose stops and moldings on inside of hollow metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.10 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances.
 - 1. Squareness: Plus or minus 1/16inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on horizontal line parallel to plane of wall.
 - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.03 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - c. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
3. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances.
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch
 - c. Between Bottom of Door and Top of Threshold: maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

3.04 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

End of Section 08 11 13

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Hardware for exterior doors.
- B. Thresholds.
- C. Weather-stripping, seals and door gaskets.

1.02 RELATED REQUIREMENTS

- A. Section 081113 – Hollow Metal Doors and Frames

1.03 REFERENCE STANDARDS

- A. ANSI/A117.1 – American National Standards for Accessible and Usable Buildings and Facilities; International Code Council; 2003.
- B. DHI (LOCS) – Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.
- C. DHI WDHS.3 – Recommended Locations for Architectural Hardware for Flush Wood Doors; Door and Hardware Institute; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- D. NFPA 80 – Standard for Fire Doors and Fire windows; National Fire Protection Association; 2007.
- E. UBC Std 7-2, Part II – Test Standard for Smoke and Draft-Control Assemblies; International Conference of Building Officials; 1997.
- F. UL (BMD) – Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication and installation of products onto which door hardware will be installed.

1.05 SUBMITTALS

- A. Finish Hardware Schedule:
 - 1. Provide detailed hardware schedule, listing each door opening separately. Include two copies of catalog cuts for each item proposed to be used on this project.
- B. Shop Drawings:
 - 1. Indicate locations and mounting heights each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
 - 2. Submit manufacturer's parts list and templates.
- C. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.06 QUALITY ASSURANCE

- A. Hardware Supplier Qualifications: A recognized distributor who has been furnishing hardware in the same area as the project for a period of not less than 5 years and has successfully completed projects similar in type and scope.
- B. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.
- C. The Hardware Supplier shall be a factory authorized distributor of the material provided and shall maintain a stock and parts inventory of all standard items supplied on the project for future service to the Owner.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.08 COORDINATION

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for the door frame.
- B. Furnish templates for door and frame preparation.
- C. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- D. Coordinate Owner's keying requirements during the course of the Work.

1.09 MAINTENANCE

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Hinges: Stanley Hardware or Precision.
- B. Locks and Latch Sets: Schlage Lock Co.
- C. Cylindrical Lock Sets: Schlage Lock Co.
- D. Mortise Lock Sets: Schlage Lock Co.
- E. Electric Strikes:
 - 1. Assa Abloy Folger Adam EDC, HES, or Securitron: www.assaabloydss.com.
- F. Closers: LCN Closers.
- G. Substitutions: See Section 01600 – Product Requirements

2.02 MATERIALS

- A. Hardware Finish per Owner, _____.

2.03 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

- A. Provide components that comply with the following:
 - 1. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
 - 2. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.
- B. Finishes: Identified in schedule at end of section.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with applicable codes.
- D. Mounting heights for hardware from finished floor to centerline of hardware item:
 - 1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
 - 2. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

3.03 FIELD QUALITY CONTROL

- A. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust hardware for smooth operation.

3.05 PROTECTION

- A. Protect finished Work under provisions of Section 01700.
- B. Do not permit adjacent work to damage hardware or finish.

3.06

- A. Refer to Door Types and Schedule on Drawings.
- B. Coordinate electrical requirements for electric strikes at entry doors with Electrical Subcontractor.

END OF SECTION

PART 1 GENERAL**1.01 INCLUDED SECTIONS**

- A. Clearing
- B. Grubbing
- C. Disposal
- D. Field Quality Control

1.02 RELATED SECTIONS

- A. Section 024113 – Selective Site Demolition
- B. Section 312300 – Excavation and Fill

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Haul location of all material(s) being transported off site.

PART 2 EXECUTION**3.01 EXAMINATION**

- A. Inspect site to verify the extents of clearing and grubbing and notify the Engineer if there is any vegetation that is likely to be damaged during the course of clearing and grubbing that is not indicated on the plans

3.02 PREPARATION

- A. Install erosion control measures indicated on the Temporary Erosions and Sediment Control plans

3.03 CLEARING

- A. The Contractor shall fell trees indicated within the project limits.
- B. The Contractor shall protect, by fencing if necessary, all trees or native growth from any damage caused by construction operations.

3.04 GRUBBING

- A. The Contractor shall grub deep enough to remove all stumps large roots, buried logs, and other vegetative material.
- B. The Contractor shall grub all areas within the project limits as shown on the drawings.

3.05 DISPOSAL

- A. Debris from clearing including brush, trees, and other vegetation shall be hauled off site to a dump site that is approved by the Engineer.

3.06 QUALITY CONTROL

- A. The Contractor shall notify the Engineer once clearing and grubbing has been completed. The engineer shall walk the site and approve the completion of the clearing and grubbing prior to the Contractor beginning to grade the site.

End of Section 31 11 10

PART 1 GENERAL**1.01 INCLUDED SECTIONS**

- A. Quality Assurance
- B. Grading Tolerances
- C. Disposal.
- D. Field Quality Control.

1.02 RELATED SECTIONS

- A. Section 311110 - Clearing and Grubbing
- B. Section 312300 – Excavation and Fill.

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Soil Sterilant product data.
- B. Soil Sterilant MSDS.
- C. Soil Sieve Analysis of subgrade material within building pad and parking lot area.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with Division 2 of the WSDOT Standard Specifications.

PART 2 PRODUCTS

- A. Soil Sterilant: Soil Sterilant shall be a commercial product containing sodium chlorate or borate which has been proven effective under local conditions and is acceptable under state and local codes.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that all trees, vegetation and organic soils have been removed within the excavation area prior to beginning work.
- B. Inspect erosion control measures to ensure proper installation prior to beginning work.
- C. Contractor shall have a certified testing laboratory perform modified proctor test on representative sample of subgrade material.

3.02 PREPARATION

- A. Clear and Grub per Section 311100.
- B. Demolition per Section 024100

3.03 GRADING

- A. The Contractor shall grade site and prepare subgrade for asphalt roadway, curbs, and building pads per Section 2-06.3 of the WSDOT Standard Specifications.

3.04 TOLERANCES

- A. The Contractor shall bring grades within the following tolerances:
1. Finish Subgrade shall be within 0.10 foot of design grade in non-structural areas.
 2. Finish Subgrade shall be within 0.05 foot of design grade in structural areas.

3.05 SOIL STERILANT

- A. Soil sterilant shall be applied under all asphalt pavement and concrete gutters.
- B. Apply soil sterilant according to manufacturer's instructions.

3.06 QUALITY CONTROL

- A. Once grading and preparation of subgrade is complete the subgrade will be field tested with a proof roll witnessed by the Engineer or Engineer's representative. Subgrade shall be firm and unyielding. If a "soft spot" is witnessed by the Engineer, the unsuitable material shall be over excavated and structural fill shall be used to replace. See specification section 312300 for procedure of installing and compacting fill.

End of Section 31 22 00

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Excavation and Backfill for Structures.
- B. Excavation and Backfill for Trenches.
- C. Structure Compaction.
- D. Trench Compaction.
- E. Disposal of Excavated Material.

1.02 RELATED SECTIONS

- A. Section 31 11 00 – Clearing and Grubbing
- B. Section 31 22 00 – Grading
- C. Section 32 11 00 – Base Courses

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Haul location of all material(s) being transported off site.
- B. See section 321100 for material submittals.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with Division 2 of the WSDOT Standard Specifications.
- B. The Contractor shall have a certified testing laboratory perform compaction tests on the trench backfill material and structural fill to show the material is compacted to 95% of maximum density determined under the tests described in WSDOT specification section 2-03.3.(14) D.

PART 2 PRODUCTS**2.01 FILL MATERIAL**

- A. All material used as fill in structural area shall meet the structural fill specification in Section 321100 of these specifications.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that all trees, vegetation and organic soils have been removed within the excavation area prior to beginning work.
- B. Inspect erosion control measures to ensure proper installation prior to beginning work.

3.02 PREPARATION

A. Clear and Grub per Section 311100.

3.03 EXCAVATION AND BACKFILL FOR STRUCTURES

Excavation and backfill for structures shall be in conformance with Section 2-09.3 of the WSDOT Standard Specifications (excavation shall be considered Class B), and as further described herein:

- A. Fill material placed under structures, including future footings and floor slabs, shall be imported structural fill as specified in Section 321100.
1. Structure excavation shall be performed as required for the construction of structures shown on the Drawings. In the event unsuitable material is encountered at subgrade elevation, over excavation will be required with structural fill used to obtain needed elevation.
 2. The Contractor shall notify the Engineer when excavation or compacted fill for structures is complete.
- B. Compaction
1. The foundation material underneath all structures shall be moisture conditioned to within 3 percent of optimum moisture content and shall be placed in loose, horizontal layers. The thickness of layers shall not exceed 8" for compaction by heavy equipment and 4" for compaction by hand-operated mechanical compactors.
 2. Layers shall be compacted to a dense state equaling at least 95% of the maximum dry density, using the modified proctor, per ASTM D1557. Prior to the placement of fill below structures, any and all groundwater and surface water shall be drained or pumped from areas to be filled.
 3. Wall backfill material shall be compacted to at least 90% of the maximum dry density, using the modified Proctor per ASTM D1557, within 5 feet of all walls. Any and all compaction within 5 feet of walls shall be accomplished by means of hand-operated mechanical equipment.

3.04 PAVED AREA EXCAVATION

Excavation and embankments as required for paved area construction shall be in conformance with Section 2-03 of the WSDOT Standard Specifications:

- A. Selected material
1. Where contract calls for raising of grade, imported structural fill meeting the requirements of Section 321100 shall be used.

3.05 EXCAVATION AND BACKFILL FOR TRENCHES

- A. Excavation and backfill for trenches shall be in conformance with Sections 7-08.3(1)A of the WSDOT Standard Specifications and as further described herein:
1. The Contractor has a maximum limit of 100 LF of open trench, and the Owner reserves the right to restrict the allowable limit of open trench as it sees fit to promote safety. Upon completion of work each day, all pipe line and open trenches shall be completely backfilled and leveled.
 2. Above the foundation material, if any, the gravel backfill for pipe bedding shall be placed in a lift of approximately 4", and compacted to 90%, creating a uniform surface on which to lay the pipe. Once the pipe has been laid, gravel backfill shall be placed by hand shovel, and compacted to 90%, to a point 6" above the top of the pipe. Complete backfilling of trenches shall not be permitted until the section of pipe in question has been inspected by the

Engineer.

3. From the point 6" above the top of the pipe, backfill with native material in 6" lifts and compacted to 95%. Until there is at least 36" of material on top of pipe the Contractor shall not bulldoze backfill material into the trench or drop it directly over the pipe. All backfill shall be free of large rocks, stumps, trees, pieces of pavement, broken concrete and other material that could damage the pipe.
4. The Contractor shall repair any defects that appear in the backfill prior to final acceptance of the work. Cleanup operations shall progress immediately behind backfilling to accommodate the return to normal use of the trench area.

B. Trench Compaction

1. Pipe bedding material shall be compacted to at least 90% of the maximum dry density, using the modified Proctor, per ASTM D1557.
2. Compaction of backfill above bedding material shall be compacted to 95% of maximum dry density, using the modified Proctor, per ASTM D1557.

End of Section 31 23 00

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Base Rock.
- B. Top Rock.
- C. Structural Fill.
- D. Gravel Backfill for Pipe Zone Bedding.

1.02 RELATED SECTIONS

- A. Section 321216 – Asphalt Paving
- B. Section 312300 – Excavation and Fill

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Soil tests and certification that ballast rock, crushed surfacing top course, pipe zone bedding and structural fill meets the material and gradation requirement of the Standard Specifications. Include laboratory test reports verifying compliance.
- B. Sand equivalency test results for ballast, crushed surfacing top course, and pipe zone bedding.
- C. Modified Proctor results for native subgrade material.

1.05 QUALITY ASSURANCE

- A. The Contractor shall have a certified testing laboratory perform compaction tests on the base rock, top rock and structural fill to show the material is compacted to 95% of maximum density determined under the tests described in WSDOT specification section 2-03.3.(14) D.

PART 2 PRODUCTS**2.01 BASE ROCK**

- A. The base rock layer shall be ballast rock that substantially conforms to Section 9-03.9(1) of the WSDOT Standard Specifications.
- B. Ballast rock must be within 5% of the specified percent passing at each sieve size except the material must have less than 9% passing the No. 200. Sand equivalency is permitted to be a minimum of 30%.
- C. Degradation Factor as stated in the WSDOT specification does not apply to this project.

2.02 TOP ROCK

- A. Top rock layer shall be crushed surfacing top course that substantially conforms to Section 9-03.9(3) of the WSDOT Standard Specifications, top course gradation.
- B. CSTC must be within 5% of the specified percent passing at each sieve size except the material must have less than 10% passing the No. 200. Sand equivalency is permitted to be a minimum of 30%.
- C. Degradation Factor as stated in the WSDOT specification does not apply to this project.

2.03 STRUCTURAL FILL

- A. Import material used to replace unsuitable material or to raise existing grade in building pad and roadway areas shall be aggregate for Gravel Base per Section 9-03.10 of the WSDOT Standard Specifications.

2.04 GRAVEL BACKFILL FOR PIPE ZONE BEDDING

- A. Material used to bed around pipe as detailed in the drawings shall be Gravel backfill for pipe zone bedding that conforms to Section 9-03.12(3) of the WSDOT Standard Specifications.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Carefully investigate site conditions and confirm that grading is adequate to achieve needed elevations by placing of granular material. Contractor must maintain minimum thicknesses of granular material as called out on plans and shown in the details.

3.02 BASE ROCK / TOP ROCK

- A. Place ballast and crushed surfacing top course as detailed in Section 4-04 of the WSDOT Standard Specifications.

3.03 TOLERANCES

- A. Finish compacted elevations of base rock and top rock shall be within 0.05' of design grade.

End of Section 32 11 00

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Hot Mix Asphalt.

1.02 RELATED SECTIONS

- A. Section 321100 – Base Courses

1.03 REFERENCES

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (current edition).

1.04 SUBMITTALS

- A. Product data and certification that asphalt concrete pavement materials comply with the specification requirements. Include design mix formula and include laboratory test reports verifying compliance with the design mix formula.
- B. Product data and certification that tack materials comply with specification requirements.

1.05 QUALITY ASSURANCE

- A. Contractor shall have a minimum of five years of experience specializing in constructing asphalt roadways and must be willing to provide past performance references if requested by the Engineer.
- B. The Contractor will provide 3rd party compaction testing that conforms to Section 5-04.3(B)1 of the WSDOT Standard Specification to determine if asphalt has been properly consolidated.

PART 2 PRODUCTS**2.01 HOT MIX ASPHALT**

- A. Hot mix asphalt concrete pavement shall be HMA Cl. ½" PG 64-22 and shall conform to Section 5-04.3 of the WSDOT Standard Specifications.

2.02 TACK

- A. Tack coat shall be required when new Asphalt Concrete Pavement is placed on, or abutting, existing asphalt. Tack coat shall be CRS-1, as specified in Section 9-02.1(6) of the WSDOT Standard Specifications.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Carefully investigate site condition and confirm that grading and placing of aggregate is to the correct elevation. Contractor must maintain minimum thicknesses of pavement as called out on plans and shown in the details.

3.02 PREPARATION

- A. The surface of the top rock shall be approved by the Engineer prior to laying asphalt.

3.03 HOT-MIX ASPHALT

- A. Asphalt concrete pavement materials shall be placed on compacted subgrade materials, as shown on the Drawings, and in conformance with Sections 4-04, 4-06, and 5-04 of the WSDOT Standard Specifications. The Contractor shall place asphalt concrete over prepared base course in a single lift. Methods of proportioning, mixing, transporting, laying, processing, rolling, and compacting the material, and the standards of workmanship shall conform to the applicable requirements of Division 5 of the WSDOT Standard Specifications.
- B. HMA shall be compacted to 91% of the referenced maximum density as determined by WSDOT FOP for AASHTO T 209.

3.04 TACK

- A. All joints of asphalt concrete pavement shall be sealed with asphalt cement. The asphalt paint binder, or tack coat, shall conform in all respects to Section 5-04 of the WSDOT Standard Specifications. After pavement is in place, all joints shall be sealed with hot asphalt cement (CRS-1).

End of Section 32 12 16