ADDENDUM

Addendum #: **1**
Date: **November 8, 2019**
Project #: **2018-0029**
Project Name: **Fir Grove Children's Center**

BID OPENING: 4:00 p.m. (PDT), November 20, 2019
(unchanged) Vancouver School District No. 37
Jim Parsley Center
2901 Falk Road
Vancouver, WA 98660

NOTE: The work stated and described in this addendum shall become a part of the Contract Documents for this project.

The revisions indicated in this narrative and the attached document represent changes from the Permit Set issued September 16, 2019 as well as from the Bid/Permit Set issued October 15, 2019. Accordingly, *changes indicated from the Permit Set do not result in any changes from the Bid Set*. This approach ensures that contractors and city inspectors are provided with identical drawing sets.

CLARIFICATIONS

- Refer to 08 32 00 for information regarding the wood sliding door at FCRC (door 115)
- Refer to 10 75 00 for information regarding flagpoles. See notes on specification 12 93 00 below.
- Refer to reissued section 08 80 00 for information regarding glazing.
- The readerboard at the monument sign is OFOI. Refer to reissued sheets and provide power and data connections. Title text "Fir Grove Children's Center" to match dimensional text requirements described for adjacent address signage.
- Specification 32 31 13 2.04A.3 does not require the contractor to have AWS certified welders on staff, however, the finished product must comply with AWS specifications and standards.
- Asphalt paving requires crushed surfacing base course as described in 5.5.3 of the geotech report.
- FSC certification is encouraged but not required for the millwork shops/casework subcontractors or other installing contractors on this project. FSC certification including chain-of-custody is required for materials only up to the point of delivery to the contractor or subcontractor.
- Acoustic foam means 2-part, closed cell spray foam insulation.
- Refer to 09 21 16 for information regarding acoustic batts.
- The pull-down changing station is OFCI as indicated in 01 64 00.
- Requirements for non-AISC certified fabricators and erectors are indicated on S002. However, the deadline to provide qualifications has passed.
- No window shades are indicated in Fitness (10), hall (123) and hall (116) nor at window W18. Motorized shades are indicated for the commons (114) and skylights. Manual shades shall span the entire window opening.
- Refer to 09 06 02 for WP-1 through WP-4 basis of design product.

SPECIFICATIONS

00 73 43 – Wage Rates Requirements
ADD Section in its entirety
01 40 00 – Quality Requirements
REVISE to include owner provided air barrier testing
08 33 13 – Coiling Counter Doors
REVISE Line 2.02A.1 to "Mounting: Surface Mounted"
REMOVE Line 2.02A.2. Specification not reissued.
08 80 00 – Glazing
REVISE to clarify intent of insulating laminated glass IG-1
ADD type G-3 to remove insulating requirement for W18.
08 44 14 – Aluminum Curtain Walls
ADD Section in its entirety to address size of W17 and W18 previously indicated as storefront
09 21 16 – Gypsum Board Assemblies
ADD Resilient sound isolator hanger clip accessory

ADD Acoustic batt insulation

11 40 00 – Food Service Equipment

REVISE Item 43 to "Not Used". Specification not reissued.

11 73 13 – Room Wall Padding

REVISE 2.01A to "Basis-of-Design: See 09 06 02 Materials & Finishes Schedule". Specification not reissued.

12 93 00 – Site Furnishings

REMOVE Paragraph 2.01B and 2.01C. Specification not reissued.

31 25 00 Erosion and Sedimentation Control:

REVISED Section 1.04 Additional Permit Required

ARCHITECTURAL DRAWINGS

Sheet:	G-001:	REVISE Sheet list. Added sheets are noted below, not specifically clouded on the index for legibility.
Sheet:	G-002:	REVISE from Permit Set to include design EUI and graphic.
Sheet:	G-003	REVISE Allowable area calculations to note more restrictive requirements. Result unchanged.
Sheet:	G-004	REVISE Deferred submittals list and separated permits.
Sheet:	G-005:	REVISE from Permit Set to include 2nd gate from south courtyard and secure key access vault at entry.
Sheet:	A-101A:	REVISE from Permit Set location of FEC.
		ADD Location of sign type "G" in FCRC limiting allowable types of cooking.
Sheet:	A-101B:	REVISE from Permit Set location of door 8
Sheet:	A-101D:	REVISE from Permit Set position of hall sinks
Sheet:	A-111A:	REVISE from Permit Set appearance of housekeeping pads
Sheet:	A-121:	REVISE schematic layout of roofing system walkway to avoid relocated kitchen exhaust.
Sheet:	A-121A:	REVISE schematic layout of roofing system walkway to avoid relocated kitchen exhaust.
Sheet:	A-151D	ADD acoustical ceiling in MS/HS Flex classroom
Sheet:	A-205:	REVISE position of opening W15.
Sheet:	A-401:	REVISE from Permit Set rated construction for future DAS system.
Sheet:	A-412:	ADD from Permit Set Monument Sign details
		REMOVE from contractor scope supply & install of readerboard. Provide stub-up for power and data only.
Sheet:	A-413:	ADD from Permit Set Hallway Sink detail
Sheet:	A-414:	ADD from Permit Set new sheet in its entirety. See notes for A-412.
Sheet:	A-503:	ADD from Permit Set Secure Key Access Vault detail
Sheet:	A-504:	ADD from Permit Set metal panel corner details
Sheet:	A-505:	ADD from Permit Set new sheet in its entirety
Sheet:	A-511:	REVISE from Permit Set all details on page
Sheet:	A-512:	ADD from Permit Set membrane roof at deck transition detail
		REVISE from Permit Set low soffit detail
Sheet:	A-514:	REVISE from Permit Set soffit detailing
Sheet:	A-515:	REVISE from Permit Set insulation at roofing penetrations
Sheet:	A-516:	REVISE from Permit Set insulation at roofing penetrations & curbs
Sheet:	A-517:	REVISE from Permit Set flashing at skylight curbs
Sheet:	A-525:	REVISE from Permit Set door jamb and sill details
Sheet:	A-531:	ADD from Permit Set window frame 3d view for clarity of existing detailing
Sheet:	A-533:	REVISE from Permit Set soffit detailing & fiber cement jambs
Sheet:	A-534:	REVISE from Permit Set soffit detailing & fiber cement jambs
Sheet:	A-541:	ADD from Permit Set MDF wall panel detail
Sheet:	A-543:	ADD from Permit Set ceiling details 6, 7 & 8.
		REVISE plotting errors from bid set.
		ADD detail 9 in its entirety.
Sheet:	A-544:	ADD from Permit Set new sheet in its entirety
		ADD new detail 2 from bid set.
Sheet:	A-611:	REMOVE from Permit Set unused frame type F3
		REVISE from Permit Set frame type F5
Sheet:	A-612:	REVISE from Permit Set hardware types
		ADD from Permit Set gates at courtyard.

ADD cased opening detail reference
Sheet: A-622 REVISE Glazing type in W18
REVISE W17 and W18 to curtain wall
REVISE W19 visibility of infill panels for clarity
Sheet: A-631 : REVISE Room finish schedule to include room 10 information missing from bid set.
Sheet: A-701: REVISE from Permit Set typical RR tile elevation
ADD from Permit Set south vestibule elevation detail
Sheet: A-702: REVISE from Permit Set callouts indicated elsewhere in this narrative
Sheet: A-703: REVISE from Permit Set callouts indicated elsewhere in this narrative
Sheet: A-705: ADD from Permit Set south hall elevation detail

CIVIL DRAWINGS

Sheet C-201 Site Plan
REVISE West Fence line away from property line.
Sheet C-502 Water Plan
REMOVE Thrust block from note 120.
Sheet C-601 Public Street Improvement Plan
ADD Street light on E. 20th Street at Sta. 6+32.80.

LANDSCAPE DRAWINGS

Sheet L-100:
ADD "L2 BUFFER REQUIREMENT (2' HT. SHRUBS-TYP.)" and arrow to buffer
ADD "L2 BUFFER REQUIREMENT EVERGREEN TREES 30' O.C. (TYP)" and arrow to buffer
ADD Tree and shrubs symbols for L2 buffer
REVISE street trees to new locations
ADD "NEW TREES ADDED FOR ADDITIONAL REQUIREMENTS 64 (30 DECIDOUS, 34 EVERGREEN)" to Landscape Narrative
REVISE Grass Lawn (To Be Mown) to "70,788 SF (1.62 ACRES)"
ADD "L2 BUFFER PLANTING SHRUBS 5,843 SF"
REVISE Total Landscape Percentage "44.8% of 4.23 ACRES"
Sheet L-200:
ADD Tree and shrubs symbols for L2 buffer
REVISE street trees to new locations
REVISE Chain Link Pedestrian Gate from "3" to "2" (removed from near emergency access rolling gate)
REVISE Buffer Planting to "7,120 SF"
Sheet L-300:
ADD Tree and shrubs symbols for L2 buffer, with appropriate species number and symbol
REVISE street trees to new locations
ADD "PROPOSED TREES AT LEAST 15' FROM LIGHT POSTS (TYP)"
ADD To Landscape Notes:
- STREET TREES TO BE 3-4' BEHIND SIDEWALK, 30' ON CENTER, MAX., PER CITY REQUIREMENTS.
- BUFFER PLANTINGS (C.O.V. L2 ALONG NORRIS & 18TH ST.) 2" CAL. TREE 30' O.C. AND 2' TALL SCREENING BEHIND STREET TREES PER CITY REQUIREMENTS."

ADD New tree symbol for CADE #4 and renumber tree symbols to correspond to species
REVISE Landscape Tree and Vegetation Schedule:
REVISE ACGR to "10" quantity
ADD "4 CADE CALDEDRUS DECURRENS INCENSE CEDAR B&B 6'-8' HT. 18"
REVISE NYSY to "9" quantity
REVISE THPL to "16" quantity
ADD "18 PROT PRUNUS LAUROCERASUS 'OTTO LUYKEN' CHERRY LAUREL 3 GAL. 110"
Sheet L-200:
ADD Tree and shrubs symbols for L2 buffer
REVISE street trees to new locations

STRUCTURAL DRAWINGS

Sheet S001:
- REVISE – Provided ground snow load.

Sheet S101A:
- REVISE – Holdown locations and callouts.
- ADD – Concrete Footing.

Sheet S101AG:
- REVISE – Holdown locations and callouts.
- ADD – Verbiage callouts with details.
- REVISE – Shear wall type callout.

Sheet S101B:
- REVISE – Holdown locations and callouts.
- ADD – Concrete Footings.

Sheet S101BG:
- REVISE – Holdown locations and callouts.
- ADD – Verbiage callouts with details.

Sheet S101C:
- REVISE – Holdown locations and callouts.
- ADD – Concrete Footings.

Sheet S101CG:
- REVISE – Holdown locations and callouts.
- REVISE – Shear wall type callout.
- REVISE – Column size.

Sheet S101D:
- REVISE – Concrete Footings.

Sheet S101DG:
- REVISE – Concrete Footings.
- ADD – Verbiage callouts with details.

Sheet S112A:
- ADD – Verbiage callouts with details.
- ADD – Fall restraints and bracing.
- REPLACE – Multiple beam sizes.
- REPLACE – Multiple detail callouts.

Sheet S112B:
- ADD – Verbiage callouts with details.
- ADD – Fall restraints and bracing.
- REPLACE – Multiple detail callouts.

Sheet S112C:
- ADD – Verbiage callouts with details.
- ADD – Fall restraints and bracing.
- ADD – WT framing members.
- REVISE – Decking orientation at single locations.
- REPLACE – Multiple detail callouts.

Sheet S112D:
- ADD – Verbiage callouts with details.
- ADD – Fall restraints and bracing.
- ADD – WT framing members.
- REVISE – Deck gage at single location.
- REPLACE – Multiple detail callouts.

Sheet S160:
- ADD – Fall restraints and bracing.
- REVISE – Deck gage at single location.

Sheet S303:
- REVISE – Detail 1/S303.
- REVISE – Detail 2/S303.

REVISE – Detail 3/S303.

Sheet S304:

ADD – Detail 5/S304.
ADD – Detail 6/S304.
ADD – Detail 7/S304.
ADD – Detail 8/S304.

Sheet S401:

REVISE – Detail 2/S401.

Sheet S403:

REVISE – Detail 1/S403.

Sheet S407:

ADD – Detail 4/S407.

Sheet S502:

REVISE – Detail 1/S502.
REVISE – Detail 2/S502.
ADD – Detail 4/S502.
ADD – Detail 5/S502.
ADD – Detail 6/S502.

Sheet S601:

REVISE – Detail 1/S601.

Sheet S602:

REVISE – Detail 1/S602.
REVISE – Detail 2/S602.
REVISE – Detail 4/S602.
REVISE – Detail 6/S602.
REVISE – Detail 7/S602.

Sheet S603:

REVISE – Detail 1/S603.
REVISE – Detail 4/S603.
ADD – Detail 6/S603.
ADD – Detail 7/S603.
ADD – Detail 8/S603.
ADD – Detail 9/S603.

Sheet S604:

ADD – Detail 2/S604.
ADD – Detail 3/S604.
ADD – Detail 4/S604.
ADD – Detail 5/S604.

MECHANICAL DRAWINGS

Sheet M-002

ADD EWH-B-1 to the Electric Heater Schedule
ADD CEF-B-4 to the Fan Schedule
REVISE KEF-1 and KEF-2 fan models and note #3 in the Fan Schedule

Sheet M-003

ADD FCU-B-2 to the Fan Coil Schedule
ADD CU-B-2 to the Condensing Unit Schedule
ADD note #3 to the Diffuser, Register, and Grille Schedule
ADD Silencer Schedule

Sheet M-101A

ADD keynote #19
ADD silencer, S-A-1, in “Fitness-10”
REVISE drum louver diffusers in “Fitness-10”

Sheet M-101B

ADD keynotes #9 & 10
ADD detail 2/M-101B
ADD CO2 sensors in classrooms

Sheet M-101C
ADD keynotes #5 & 6

Sheet M-101D
ADD keynotes #9, 10, 11, & 12
ADD return duct for RTU-3 & RTU-4
ADD silencer, S-D-1, in "B. Oper-128" and S-D-2 in "Hall-141"
REVISE supply diffusers in "MS/HS Flex-4" to accommodate lower ceiling area.
REVISE location of southern transfer air grille and ductwork in "MS/HS Flex-4"

Sheet M-121A
ADD keynotes #6 & 7
ADD silencer, S-A-2, in return duct of RTU-1
REVISE KEF-1 & KEF-2 fan types and duct routing

Sheet M-121D
REVISE location of exhaust termination point for CEF-D-3

Sheet M-402
ADD detail 12/M-402

PLUMBING DRAWING

Sheet P-002:
ADD note to roof drain and overflow drain in schedule; system sized per UPC Table D101.1.

Sheet P-101A:
ADD keynote 3 to plan view
ADD sheet keynote 3, with apron cane requirements.

ELECTRICAL DRAWINGS

Sheet E-100:
ADD street light and keynotes 9 and 10.

Note: The following electrical comments occurred between the Permit and Bid Sets

Sheet E-101A:
REVISE lighting layout in Kitchen 117.

Sheet E-102A:
ADD detail 2/E-102A.

Sheet E-201A:
ADD auto door operator and push buttons.
ADD GFCI receptacle in FCRC 115.
ADD power for motorized shade controller
ADD keynotes 3 and 4
REVISE GFCI receptacles in Staff Break Room to non-GFCI
ADD quadplex receptacle to STOR 10A
REVISE receptacle locations for TV/monitor in FITNESS 10

Sheet E-201B:
ADD detail 2/E-201B.

Sheet E-601:
ADD mechanical equipment CEF-B-4, CU-B-2, EWH-B-1, FCU-B-2 as part of Alternate 1.

Sheet E-702:
ADD detail 4/E-702.

FOOD SERVICE DRAWINGS

Sheet FS101:

REVISE Equipment Schedule – Item 3 Mop Sink Closet -Change 'Remarks' to "Owner Furnished/Contractor Installed
REVISE Equipment Schedule – Item 5 Cube Ice Machine with Bin -Change 'Remarks' to "Owner Furnished/Contractor Installed

SUBSTITUTIONS (provided in a subsequent addendum)

END OF ADDENDUM # 1

Attachments:

Drawing Sheets as noted above
Specification sections as noted above

SECTION 00 73 43

WAGE RATES REQUIREMENTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Washington State prevailing wage rates apply to this project. Access the wage rate information as follows:
   1. URL to the Department of Labor & Industries Prevailing Wage Rates: https://fortress.wa.gov/lni/wagelookup/prvWagelookup.aspx for current rates.
   2. Select Clark County for location of public works project.

B. The Effective Date of wage rates used for this project will be based on the bid date found in Bid Form, or as modified by addenda.

C. A copy of the prevailing wage rates are available for viewing at the Vancouver School District Planning Office located at 2901 Falk Road, Vancouver, WA 98661.

D. The Vancouver School District Planning Office (360.313.1040) will mail you a hard copy upon request if notified two (2) weeks prior to official date and time for receipt of bid.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Control of installation.
F. Mock-ups.
G. Tolerances.
H. Manufacturers' field services.
I. Defect Assessment.

1.02 REFERENCE STANDARDS

A. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2016.
B. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2016.
C. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.
D. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.
E. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2018b.
F. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2018.
G. ASTM C42/C42M - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
H. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2012, with Editorial Revision (2015).
I. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2016a.
J. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization; 2010.
K. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.
L. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2017.
M. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Owner.
    1. Include:
        a. Date issued.
        b. Project title and number.
        c. Name of inspector.
        d. Date and time of sampling or inspection.

e. Identification of product and Specifications section.
f. Location in the Project.
g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Compliance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as Contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as Contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications:
1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
3. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

B. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

C. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.05 REFERENCES AND STANDARDS

A. For products and Workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific Work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the Contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect will be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING AND INSPECTION AGENCIES AND SERVICES

A. See modified AIA Document A201, General Conditions of the Contract for Construction for additional requirements.

B. Inspections and tests to be paid by Owner are herein specified and are in addition to those conducted by Building Officials. Contractor shall provide such inspections and tests as required in addition to those listed herein to assume compliance with all requirements indicated, specified, or required to comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work.

C. Contractor shall be responsible for coordination of all required testing/inspection with Testing Laboratory, Architect, Engineer, Building Official, and Owner.

D. See Structural Specifications and notes in the Drawings for any additional testing and inspection requirements than those listed in this Section.

E. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

F. Submittals:
   1. Promptly process and distribute copies of all inspections and related instructions for corrective action required.
   2. Promptly process and distribute copies of all test reports and related instructions to assure necessary re-testing and replacement of materials with the least possible delay in progress of the Work.
   3. Distribute all inspection reports and test reports no later than 5-days following the activity to the Architect, Engineer (by discipline), Owner, Contractor, and Building Official.

G. Tests:
   1. Contractor shall be charged with the responsibility of coordination and timing of all such tests herein specified. Contractor to consult and schedule Work requiring testing with the testing agency. Contractor to notify the testing agency and the Architect at least 24-hours in advance of the Work requiring testing.
   2. Testing costs required by defective Work or improperly timed notices or canceled Work without proper notice, shall be paid by Contractor.
   3. The following tests shall be made by an independent testing laboratory, selected and paid for by the Owner. Refer to Structural notes in drawings for additional information and requirements. All testing shall be in accordance with IBC, Chapter 17.
      a. Soil Compaction - Modified Proctor Procedure, ASTM D1557-00.
         1) Test fills and backfills as required by Geotechnical Soils Report.
         2) Testing is required only in areas under, or backfill against, structure and in areas of paving for vehicle traffic.
      b. Excavations, compaction of sub-grades, structural fills and backfills:
         1) Soil Inspecting and Testing:
            (a) Make required inspections and test including, but not necessarily limited to:

(b) Visually inspect on-site and imported fill and backfill, making such test and retests as are necessary to determine compliance with the Contract requirements and suitability for the proposed purpose.
(c) Make field density tests on samples from in-place material as required.
(d) As pertinent, inspect and test the scarifying and re-compacting of cleaned sub grade; inspect the progress of excavating, filling, and grading; make density tests at fills and backfills as required by the soils report. Verify compliance with provisions of the Contract Documents and governmental agencies having jurisdiction.

c. Concrete Density (Unit Weight) Test - Concrete Slabs Only
   1) Perform ASTM C138 Standard Test Method for Density, yield, and air content for every thirty yards of concrete delivered to job site.
   2) Perform calculations to determine unit weights, and by extrapolation, determine the actual water/cement ratio of the concrete.
   3) Report results of test to the Architect by noon of the following day.
d. Concrete Slump Test - ASTM C 143: Perform slump test for every concrete load.
e. Concrete Cylinders - ASTM C 31.
   1) Make 3-test cylinders for each class of concrete placed, for every concrete pour, and for every 100 cubic yards in a pour.
   2) Report the mix, slump, location in the structure, and the compression test results.
f. Concrete Compression Test - ASTM C39.
   1) Test 1-cylinder at 7-days, 1-cylinder at 28-days, and 1-cylinder when so directed.
   2) Report the mix, required strength, slump, date cylinder cast, location in structure, and tested strength.
g. Concrete Air Content Test - ASTM C138: Perform test for every pour of exterior flat Work.
h. Concrete Core Test - ASTM C42.
   1) Perform test only if required by Architect.
   2) Cut from locations directed by Architect.
i. Concrete Slab Moisture Content - ASTM F1869.
   1) Conduct anhydrous calcium chloride test for every 1000 square feet (or as directed by Architect).
   2) Control air temperature and relative humidity of the interior space during the time of the test. Air temperature shall be maintained at a minimum temperature of 68-degrees Fahrenheit and relative humidity shall be a maximum of 45 per cent during testing. Test report shall include the range of temperature and relative humidity of the interior space during the time of the test.
j. Concrete Slab Alkalinity - ASTM F710-98: Conduct Test for every 1000 square feet.
k. Measure Temperature and relative humidity of the building interior from the time that the building shell is closed until the floor finishes are applied. Measurements shall be recorded weekly and reported every other week. In a large compartmented building, measurements will be required in several locations.
   1) In accordance with Section 01 51 23 Temporary Heating, Ventilating, and Dehumidification, deliver data to Architect weekly.
l. Masonry Mortar and Grout Compressive Strength Tests - ASTM C1314-00a.
   1) Contractor shall construct for testing a set of prisms 3 for each type of structural masonry on project.
   2) Contractor shall construct a set of prisms for every 5000 square feet of each type of structural masonry.
m. Masonry Grout Test - ASTM C1019-00b: Construct and test three (3) specimens of grout for each grout pour.
n. Masonry Mortar Test - ASTM C109-C 109M-99.
   1) Construct and test 3-specimens of mortar for each type of mortar on the project.

2) Construct and test 3-specimens of mortar for every 5000 square feet of each type of structural masonry.

o. Nondestructive Testing (reference IBC Section 1708).

p. Intumescent Fireproofing - ASTM E119: Measure the dry film thickness of the intumescent paint to certify that it meets the requirement of the manufacturer and United Laboratory listing for the specified fire rating.

q. Cementitious Fireproofing: Measure thickness and inspect spray-applied fire resistive material in accordance with AWCI Publication: Standard practice for the Testing and Inspection of field applied sprayed fire-resistive materials.

r. Fire Stopping and Smoke Barriers: See Section 07 84 13.

s. Building Envelope Air Leakage Testing - ASTM E779 testing per the Washington State Energy Code (WSEC)

1) The air leakage rate of the building envelope shall not exceed 0.40 cfm/sf at a pressure differential of 0.3 inches water gauge in accordance with ASTM E779.

H. Inspections:

1. The following inspections shall be made by an independent testing and inspection laboratory, selected and paid for by the Owner.
2. Contractor shall be charged with the responsibility of coordination and timing of all such inspections and tests herein specified. Consult and schedule Work requiring inspection with the inspection agency. Notify the inspection agency, the Architect and the Owner at least 24-hours in advance of the Work requiring inspection/testing to allow time to provide for inspectors.
3. Inspection and testing costs required by defective Work or improperly timed notices or canceled Work without proper notice or for per-diem costs associated with off-site testing/inspection beyond 30 miles from project site, shall be paid by Contractor.
4. Inspections: Inspect and assure compliance with the Contract documents for the following Work:
   a. Site grading operations
   b. Concrete Reinforcement Inspection:
      1) Prior to use, confirm all reinforcement steel bars comply with specified standards.
         (a) Require the supplier to furnish mill test reports to the testing laboratory for certification.
         (b) Tag identified steel at the supplier’s shop.
         (c) Unidentified steel shall not be used in this project.
      2) Provide continuous inspection for all welding of reinforcement steel.
   c. Placement and condition of masonry reinforcement.
   d. Structural Steel Inspecting:
      1) Prior to use, confirm structural steel complies with the specified standards.
         (a) Material identified by mill test reports, and certified by the testing laboratory for certification.
         (b) Require the supplier to furnish mill test reports to the laboratory for certification.
         (c) Tag identified steel at the supplier’s shop.
         (d) If steel arrives at the job site without such tags, it shall be rejected.
      2) Unidentified steel shall not be used on this project.
      3) Shop Welding and Field Welding (Reference IBC Section 1704):
         (a) Provide qualified testing laboratory inspector.
         (b) On single pass welds, inspect after completion of welding and prior to painting.
         (c) On multiple pass welds, and on butt welds with cover pass on the back side, provide continuous inspection.
      4) Field Welding: Provide continuous inspection by a qualified testing laboratory inspector.

5) Structural Engineer of record "shall perform the structural observation on all steel frames. Owner's testing and inspection laboratory shall perform all special inspections required by IBC, and continuously inform the structural engineer of all special inspections.
6) Contractor shall be responsible for travel costs associated with Owner's testing of project steel fabrication observation/testing beyond 400 miles of project site.

e. Concrete Inspection:
1) Portland Cement:
(a) Secure from the cement manufacturer Certificates of Compliance delivered directly to the concrete producer for further delivery directly to the testing laboratory.
(b) Require the Certificates of Compliance to positively identify the cement as to production lot, bin or silo number, dating and routing of shipment, and compliance with the specified standards.
(c) If so required by the Architect, promptly provide such other specific physical and chemical data as required.
2) Placement Inspections:
(a) Verify that all steel reinforcement is placed in accordance with Contract documents.
(b) Throughout progress of concrete placement, make slump tests to verify conformance with specified slump.
(c) Using all required personnel and equipment throughout progress of concrete placement, verify that finished concrete surface will have the level or slope that is required by the Contract Documents.
(d) Note in reports any addition of water to the concrete mix during placement.

f. Masonry:
1) Verify that all steel reinforcement is placed in accordance with Contract Documents.
2) Verify that brick veneer anchors are being attached properly and at proper intervals.

g. Provide video inspection of all plumbing waste lines 4-inches diameter and larger, if required by Architect.

h. Inspect all installation of firestopping to verify compliance with applicable codes and standards.

i. **AIRBARRIER BLOWER DOOR TESTING**

I. Special Inspection: (Reference IBC Chapter 17)
1. In addition to the inspections listed in Part 2.02, the Owner shall employ an independent testing laboratory to provide special inspection on the types of Work listed in this section and/or called out in the structural notes on the Drawings if they are included in this project.
a. Types of Work:
1) Asphalt sub-base compaction and asphalt density.
2) Concrete with design compressive strength greater than 2500 psi.
3) Bolts installed in concrete
4) Special moment-resisting concrete frame
5) Reinforcing steel and pre-stressing steel tendons
6) Structural Welding (see exceptions IBC Section 1704 and 1707.2)
(a) Special moment-resisting steel frames
(b) Welding of reinforcing steel. (See exception)
7) High strength bolting
8) Structural masonry when f1m is greater than 1500 psi for concrete units or 2600 psi for clay units.
9) Reinforced gypsum concrete
10) Insulating concrete fill
11) Spray-applied fire-resistive materials

12) Piling, drilled piers, caissons, and soil nailing
13) Shotcrete
14) Special grading, excavation, and filling
15) Smoke-Control System
16) Suspended Ceilings

J. Structural Observation:
1. When structural observation is required by IBC Section 1709, the observation will be conducted by the Structural Engineer of Record.
2. Reports will be made as required by IBC Section 1709.

K. Notices and Cooperation:
1. Contractor shall coordinate all such inspections and tests with proper authorities and notify Owner, Engineer, Architect, Owner and Building Official at least 24-hours in advance to allow them to witness such inspections or tests at their discretion.

L. Taking Specimens:
1. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

M. Reports:
1. Reports of all inspections and tests shall be submitted to Owner, Architect, Engineer, and Building Department, except concrete density tests.
a. Concrete density tests shall be submitted to the Architect by noon of the day following the test.
b. Reports of concrete compression strength test and concrete moisture tests shall be forwarded within 24-hours after testing.
c. Inspection reports shall contain:
1) Job name, Address, Architect, Engineer, Contractor, Subcontractor
2) Name of Inspector, date of inspection, area of inspection, type of inspection such as Formwork, rebar, etc.
3) Report whether everything was acceptable or not. If not, why, and action initiated.
4) Concrete Reports: Areas of inspection/pours, type of concrete, concrete strength specified, mix total yardage poured, slumps, number of cylinders made and their nomenclature, air temperatures, admix specified and contained in delivered mix, weather conditions.

N. Defective Work:
1. Should testing indicate that concrete does not conform to Specification standards, Contractor shall be required to perform on-site load or core tests as directed at the expense of the Contractor.
a. Should such specimens fail to develop minimum specified strength, the faulty concrete and all adjacent Work affected shall be removed and replaced. Costs of tests, demolition and replacement at Contractor’s expense.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and Workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise Workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and Workmanship. Additional mock-up requirements are defined in individual technical sections.

B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.

D. Additional Mock-Ups: As defined in individual Specification Sections.

E. Notify Architect fifteen (15) Working days in advance of dates and times when mock-ups will be constructed.

F. Provide supervisory personnel who will oversee mock-up construction. Provide Workers that will be employed during the construction at Project.

G. Tests; Perform under provisions identified in this section and identified in the respective product specification sections.

H. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

I. Obtain Architect's approval of mock-ups before starting Work, fabrication, or construction.

J. Accepted mock-ups to be a comparison standard for the remaining Work.

K. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

L. Where possible salvage and recycle the demolished mock-up materials.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION - ROLES AND RESPONSIBILITIES

A. See individual specification sections and Structural Notes in Drawings for additional testing and inspection required.

B. Testing Agency Duties, including but not limited to:
   1. Test samples of mixes submitted by Contractor.
   2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.

3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
7. Per-diem costs (travel, accommodations, meals) required of Owners testing/inspection services beyond 100 miles from project site.

E. Re-testing required because of non-conformance to specified requirements to be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements will be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of Workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 08 44 13
GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.

1.02 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

C. AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts; 2018.

D. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.

E. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

F. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

G. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

H. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

I. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

J. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

K. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

M. ASTM C1249 - Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications; 2018.

N. ASTM C793 - Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants; 2005 (Reapproved 2017).

O. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.

P. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

Q. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

R. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

S. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

T. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).

U. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Shop Drawings: Provide details of proposed structural sealant glazing (SSG) and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing.

E. Samples: Submit two samples 12 by 12 inches in size illustrating finished aluminum surface, glazing, and glazing materials.

F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

G. Structural Sealant Glazing (SSG): Submit product data and calculations showing compliance with performance requirements.

H. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.

I. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Verify that each component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties; size, shape, dimensions, material, self-life, storage conditions, and color.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five years of documented experience.

D. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Verify actual dimensions of openings for curtain wall by field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

1. Coordinate field measurements and fabrication with construction schedule to avoid delays in the work.

B. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide ten year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Kawneer North America; 1600UT: www.kawneer.com.

B. Other Glazed Aluminum Curtain Walls Manufacturers:
   1. C.R. Laurence Company, Inc; U.S. Aluminum; 3252: www.crl-arch.com/#sle.
   2. EFCO, a Pella Company; 5600 PG: www.efcocorp.com.

2.02 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Outside glazed, with pressure plate and mullion cover.
   2. Fabrication Method: Either shop/factory or field fabricated system.
   3. System Depth: 6-inch.
   4. Vertical Mullion Dimensions: 2-1/2 inches wide by 6 inches deep or 2-1/2 inches wide by 7-1/2 inches deep as required by structural engineer designing the system..
   5. Finish: Class I natural anodized.
      a. Factory finish surfaces that will be exposed in completed assemblies.
      b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   6. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
   1. Design Wind Loads: Comply with Structural Drawings for design wind loads..
      a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
   2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.
   3. Interstory Differential Lateral Movement: Meeting pass/fail criteria of AAMA 501.4 for Use Group II, High Occupancy Assembly, when tested at design displacement of 0.010 times greater adjacent story height, maximum, and 1.5 times design displacement, through three complete cycles.
   4. Movement: Accommodate the following movement without damage to components or deterioration of seals:
      a. Expansion and contraction caused by 180 degrees F surface temperature.

b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
c. Movement of curtain wall relative to perimeter framing.
d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
1. Test Pressure Differential: No leakage >15 psf lab/10 psf field test pressure.

D. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.

E. Air Infiltration: <0.30 CFM/SF @ 6.24 PSF.

F. Thermal Performance Requirements:
1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
2. Overall U-value Including Glazing: 0.38 Btu/(hr sq ft deg F), maximum to meet Washington State Energy Code.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

B. Glazing: As specified in Section 08 80 00.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

D. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.

E. Concealed Flashings: Stainless steel, 26 gage, 0.0187 inch minimum thickness.

F. Aluminum Closure Panel and Angles: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.

G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

H. Glazing Accessories: As specified in Section 08 80 00.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.

B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 08 80 00, using exterior dry glazing method.

I. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
   1. Architect, Building Envelope Consultant, Owner, and storefront manufacturer to be notified in writing prior to field testing.

B. Provide field testing of installed curtain wall system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as directed by Architect.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
   3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 10 psf.
      a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.

C. Repair or replace curtain wall components that have failed designated field testing, and retest at no cost to Owner to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating items for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

D. Excess sealant to be cleaned up per manufacturer's recommendations.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Glazing compounds and accessories.

1.02 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

G. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

H. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

I. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2015.

J. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

K. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

L. GANA (GM) - GANA Glazing Manual; 2008.

M. GANA (SM) - GANA Sealant Manual; 2008.

N. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.

O. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

P. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2017.

Q. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014, with Errata (2017).

R. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2017.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Samples: Submit one sample 12 by 12 inch in size of glass units.

E. Samples: Submit samples of frosted glass for color and translucency selection.

F. Certificate: Certify that products of this section meet or exceed specified requirements.

G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 40 degrees F.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
1. Garibaldi Glass: www.garibaldiglass.com.
2. Hartung Glass Industries: www.hartung-glass.com.
3. Northwestern Industries, Inc: www.nwiglass.com.
4. Oldcastle BuildingEnvelope: www.oldcastlebe.com.
5. Viracon, Inc: www.viracon.com.
6. Vitrium Industries: www.vitrium.ca.
7. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Float Glass Manufacturers:
1. AGC Glass Company North America, Inc: www.us.agc.com.
2. Cardinal Glass Industries: www.cardinalcorp.com.
3. Guardian Industries Corp: www.sunguardglass.com.
4. Pilkington North America Inc: www.pilkington.com/na.
5. Vitro Architectural Glass (formerly PPG): www.vitroglazings.com.
6. Substitutions: Refer to Section 01 60 00 - Product Requirements.

C. Laminated Glass Manufacturers:
1. Cardinal Glass Industries: www.cardinalcorp.com.
2. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
3. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
1. Design Pressure: Calculated in accordance with ASCE 7.

a. Refer to values indicated in Structural Notes.
2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
5. Glass thicknesses listed are minimum.

B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
a. Refer to Section 07 25 00.
2. To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapor retarder and air barrier seal.
3. To maintain a continuous vapor retarder and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 criteria.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Safety Glass: Complies with ANSI Z97.1 and 16 CFR 1201 test requirements for Category II.
2. Polyvinyl Butyral (PVB) Interlayer: 0.060 inch thick, minimum.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
1. Any of the manufacturers specified for float glass.
2. Any of the fabricators specified, certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
3. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Metal Edge Spacers: Aluminum, bent and soldered corners.
4. Spacer Color: Black.
5. Edge Seal:
a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
6. Color: Black.
7. Purge interpane space with dry air per glazing type, hermetically sealed.

C. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
   1. Applications: Exterior glazing unless otherwise indicated.
   2. Space between lites filled with 90 percent argon, minimum.
   3. Outboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum. Tempered safety glass where required by code.
      a. Tint: Gray.
      b. Coating: Low-E (passive type), on #2 surface.
   4. Inboard Laminated Lite: Heat-strengthened float glass, 3 mm + 3 mm thick minimum; 4 mm + 4 mm where required by glazing size.
      a. Tint: Clear.
      b. Interlayer: 0.060 inch PVB interlayer between #4 and #5 surfaces.
   5. Total Thickness: 1 inch typical, 1-1/8 inch maximum.
   6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, maximum.
   7. Visible Light Transmittance (VLT): 34 percent, nominal.
   8. Solar Heat Gain Coefficient (SHGC): 0.20 percent, nominal.
   9. Visible Light Reflectance: Exterior 6 percent, interior 12 percent, nominal.
   10. Glazing Method: Wet glazing method, sealant and sealant.
   11. Basis-of-Design: Vitro Architectural Glass Solarban 70 (2) Solargray + Clear.

D. Type IG-2 - Composite Panel, Anodized Aluminum Face.
   1. Applications: See Drawings.
   2. Finish: Class I Anodized Aluminum, Smooth
   3. Color: Clear
   4. Exterior Substrate: Cement Board or High Density Polypropylene
   5. Core: Polyisocyanurate.
   6. Interior Substrate: Cement Board or High Density Polypropylene
   7. Tolerances: .8 percent of panels dimension length and width +/- 1/16-inch thickness.
   8. Overall Panel Thickness: 1-inch.
   9. R-Value: 6, minimum
   10. Glazing Method - Wet glazing method, sealant & sealant.
   11. Manufacturer:
      a. Basis-of-Design: Mapes-R Infill Panel
      b. Guardian GlazeGuard 1000 WR+
      c. Substitutions: See Section 01 60 00 - Product Requirements

2.05 GLAZING UNITS

A. Type G-1 - Monolithic Safety Glazing: Non-fire-rated.
   1. Applications:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on drawings.
   2. Glass Type: Laminated safety glass as specified.
   3. Tint: Clear.
   4. Outer Layer: Heat strengthened glass, 1/8 inch thick, minimum.
   5. Interlayer: Polyvinyl butyral (PVB), 0.060 inch minimum.
   6. Inner Layer: Heat strengthened glass, 1/8 inch thick, minimum.

B. Type G-2 - Monolithic Safety Glazing: Non-fire-rated.
   1. Applications:
      a. Glazed lites in doors, except fire doors.
      b. Other locations required by applicable federal, state, and local codes and regulations.
      c. Other locations indicated on drawings.
   2. Glass Type: Laminated safety glass as specified.
   3. Tint: Frosted.

4. Outer Layer: Heat strengthened glass, 1/8 inch thick, minimum.
5. Interlayer: Polyvinyl butyral (PVB), 0.060 inch minimum.
6. Inner Layer: Heat strengthened glass, 1/8 inch thick, minimum.

C. Type G-3 - Monolithic Safety Glazing: Non-fire-rated.
1. Applications:
   a. At Window Type W18 as indicated on drawings.
   b. Other locations required by applicable federal, state, and local codes and regulations.
2. Glass Type: Laminated safety glass as specified.
3. Tint: Clear.
4. Outer Layer: Heat strengthened glass, 1/4 inch thick, minimum.
5. Interlayer: Polyvinyl butyral (PVB), 0.060 inch minimum.
6. Inner Layer: Heat strengthened glass, 1/4 inch thick, minimum.

2.06 GLAZING COMPOUNDS

A. Type GC-3 - Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C920, Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

B. Type GC-4 - Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

C. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

2.07 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
1. Width: As required for application.
2. Thickness: As required for application.
3. Spacer Rod Diameter: As required for application.

D. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that the minimum required face and edge clearances are being provided.

C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.

3.04 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Place setting blocks at 1/4 points and install glazing pane or unit.

C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch intervals, 1/4 inch below sight line.

D. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.

E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.05 CLEANING

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

C. Remove non-permanent labels immediately after glazing installation is complete.

D. Clean glass and adjacent surfaces after sealants are fully cured.

E. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.
B. Metal channel ceiling framing.
C. Suspended gypsum board ceilings.
D. Acoustic insulation.
E. Gypsum sheathing.
F. Cementitious backing board.
G. Gypsum wallboard.
H. Joint treatment and accessories.
I. Textured finish system.

1.02 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
F. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012.
G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
H. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
I. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2017.
J. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2018b.
K. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
L. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.
M. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2017.
N. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018.
O. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets; 2017.
P. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2017a.
Q. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

R. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2018a.

S. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2018.

T. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

U. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

V. GA-600 - Fire Resistance Design Manual; 2015.

W. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 SUBMITTALS

A. See Division 01, General Requirements.

B. Design Calculations: For suspended gypsum board ceilings. Submit as a deferred submittal, to governing authorities having jurisdiction.
   1. Design calculations to be stamped and signed by Professional Structural Engineer as defined by Quality Assurance article.

C. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.04 QUALITY ASSURANCE

A. Provide design calculations and design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

1.05 MOCK-UP

A. Texture Mock-up: Upon completion of joint treatment, provide an in-place wall texture mock-up for approval by the Architect, minimum 4 feet wide by 8 feet tall. The approved sample will be the basis of for all textured areas. Areas installed that do not match the sample will be subject to texture reapplication.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

B. Fire Rated Assemblies: Provide completed assemblies as indicated by Wall Type descriptions on Drawings.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. CEMCO: www.cemcosteel.com.
   2. Scafco Steel Stud Company: www.scafco.com.
   3. Steeler, Inc: www.steeler.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Loadbearing Framing System Components: 1; galvanized sheet steel, of size and properties necessary to comply with 2 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
   1. Studs: "C" shaped with flat or formed webs.
      a. Punched for utility access.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped and T-shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 40 00.

D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Deflection and Firestop Track:
      a. Products:
         1) FireTrak Corporation; Posi Klip.
         2) Metal-Lite, Inc; The System.
         3) Substitutions: See Section 01 60 00 - Product Requirements.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. CertainTeed Corporation: www.certainteed.com.
   2. Georgia-Pacific Gypsum: www.gpgypsum.com.
   3. National Gypsum Company: www.nationalgypsum.com.
   4. USG Corporation: www.usg.com.
   5. Substitutions: See Section 01 60 00, Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; long edges tapered.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
      a. Required for all gypsum wallboard install before building is water tight and before temporary heating/ventilating/dehumidifying systems are operational.
   3. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold resistant board is required at all "wet" areas where the wallboard finish is paint. Provide at all rest rooms, locker rooms, and at walls behind sinks.
   5. Type: Fire-resistance rated Type X, UL or WH listed.
   6. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings: 5/8 inch.

C. Abuse Resistant Wallboard:
   1. Application: For use at all corridors, halls, lobbies, commons areas, collaboration areas and reception areas.
   2. Surface Abrasion: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
   3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   6. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
   7. Type: Fire resistance rated Type X, UL or WH listed.
   8. Thickness: 5/8 inch.

9. Edges: Tapered.

D. Backing Board For Wet Areas:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. For use at fire rated wall assemblies and non-fire rated wall assemblies where tile does not cover entire wall.
4. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
   a. Thickness: 5/8 inch.
   b. Products:
      1) National Gypsum Company; PermaBase Cement Board: www.nationalgypsum.com.
      2) USG Corporation; Durock Cement Board: www.usg.com.
      3) Substitutions: See Section 01 60 00, Product Requirements.
5. ASTM Cement-Based Board: Non-gypsum-based, non-combustible, cementitious board complying with ASTM C1288.
   a. Thickness: 1/2 inch nominal.
   b. Not for use at fire rated wall assemblies.
   c. Products:
      1) James Hardie Building Products, Inc; HardieBacker 500: www.jameshardie.com.
      2) Substitutions: See Section 01 60 00, Product Requirements.

E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
4. Core Type: Regular and Type X, as indicated.
5. Type X Thickness: 5/8 inch.
6. Regular Board Thickness: 5/8 inch.
7. Edges: Square, for vertical application.
8. Glass Mat Faced Products:
   a. National Gypsum Company; Gold Bond eXP Sheathing.
   b. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Acoustic Insulation: Preformed glass fiber, friction fit type, unfaced.
1. Application at Walls: Provide sound batts at interior walls surrounding restrooms, offices, classrooms, and where indicated on Drawings.
2. Application at Ceilings: Provide sound batts at suspended and framed ceilings as follows:
   a. On each side of walls that are called to have acoustical insulation, for a width of 4 feet minimum from face of wall.
   b. Where indicated on Drawings.
3. Thickness: To suit wall stud cavity.
   a. Ceiling Applications: 5-1/2 inch thick batts.
4. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
5. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
6. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
7. Formaldehyde Content: Zero.
8. Density: 2.5 lb/ft 3.
9. Manufacturers:
   a. CertainTeed Corporation; CertaPRO Acoustatherm Batts: www.certainteed.com.

b. Rockwool Safe n Sound acoustic blanket insulation: www.rockwool.com
c. Johns Manville Co.: Minwool SAFB: www.johnsmanville.com.
d. Owens Corning Corporation; Thermafiber Sound Attenuation Fire Blanket: www.owenscorning.com.
e. Knauf: www.knaufinsulation.com.
f. Substitutions: See Section 01 60 00, Product Requirements.

B. Sound Isolation Clip:
1. Sound Isolation Clips:
a. Basis-of-Design: Clark Dietrich RC-1 Pro; www.clarkdietrich.com.
b. Substitutions: See Section 01 60 00 - Product Requirements.
2. Drywall Furring Channel:
a. Minimum Requirements: 25 gauge, hemmed edge detail required on all 25 gauge furring channel. Meets or exceeds SFIA requirements.
b. Depth: 1/2 inches.
c. Width Bottom: 2-9/16 inches to 2-inches wide.
d. Width Top: 1-1/4 inch wide.
3. Sound Isolation Hanger Clips:
a. Location: MS/HS Flex Classroom Ceiling.
b. Products:
1) Basis-of-Design: PAC International RSIC-HWI Hanger Wire Isolator.
2) Substitutions: See Section 01 60 00 - Product Requirements.

C. Water-Resistive Barrier: As specified in Section 07 25 00.

D. Finishing Accessories: ASTM C1047, galvanized steel, unless noted otherwise.
1. Types: As detailed or required for finished appearance; cornerbead, J-shaped beads and L-shaped beads.
2. Control Joint Beads: Extruded vinyl formed with V-shaped slot covered with removable flexible vinyl strip.

E. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel, unless noted otherwise.
1. Rigid Corner Beads: Low profile, for 90 degree outside corners.
a. Products:
1) Phillips Manufacturing Co; Everlast Corner Bead: www.phillipsmfg.com.
2) Substitutions: See Section 01 60 00, Product Requirements.
2. L-Trim with Tear-Away Strip: Sized to fit 5/8 inch thick gypsum wallboard.
a. Products:
1) Phillips Manufacturing Co; gripSTIK L-Tear: www.phillipsmfg.com.
2) Substitutions: See Section 01 60 00 - Product Requirements.
3. Expansion Control Joints:
a. Type: V-shaped PVC with tear away fins.
b. Products:
1) Phillips Manufacturing Co; 093 E-Z Strip Expansion Control Joint: www.phillipsmfg.com.
2) Substitutions: See Section 01 60 00 - Product Requirements.

F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch wide, perforated, cross-laminated, reinforced paper tape for joints and corners.
2. Ready-mixed vinyl-based joint compound.

G. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

H. Textured Finish Materials: Latex-based compound; plain (non-aggregated). Texture materials to be compatible with joint treatment materials and compounds.

I. Primer: Flat latex basecoat paint-type product formulated to provide a prime coat over interior gypsum board prior to texture finish, similar to sheetrock “first coat”. This prime coat does not replace the prime coat required for finish painting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

B. Moisture resistant gypsum board to be used at all locations if installed prior to building being dried in.

3.02 FRAMING INSTALLATION

A. General: Construct system to accommodate construction tolerances, deflection of building structural members and clearance of intended openings as indicated on Drawings and in Specifications and in accordance with all applicable governing agencies.

B. Suspended Ceilings and Soffits: Space framing and furring members at 16 inches on center.
   1. Level ceiling and soffit system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs at 16 inches on center, or as indicated on Structural Drawings.
   1. Extend partition framing to ceiling, above ceiling or to underside of structure to structure where indicated.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure. Verify free movement of top of stud connections.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

F. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

G. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Wall mounted shelving and brackets.
   4. Plumbing fixtures.
   5. Toilet and bath accessories, including grab bars.
   6. Wall mounted door hardware.
   7. Chalkboards and marker boards.
   8. Wall paneling, siding and trim.
   9. Mechanically attached signage.
   10. Projection screens and projectors.
   11. Miscellaneous wall-mounted equipment and accessories, including Owner furnished and/or Owner installed items.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.

3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

C. Sound Isolation Clips and Furring Channels:
1. Install per sound isolation clip manufacturers instructions with furring channels at 16-inches on center and sound isolation clips at 48-inches on center.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

F. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
1. Seal joints, cut edges, and holes with water-resistant sealant.

G. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

H. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. General: All metal trims to be mechanically fastened with screws at 9 inches on center each wing, and within 2 inches of ends.

B. Control Joints: Place control joints consistent with lines of building spaces and as follows:
1. Not more than 30 feet apart on walls and ceilings.
2. Center on walls or align to nearest window edge; confirm with Architect.

C. Corner Beads: Install at external corners, using longest practical lengths.

D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.06 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated. Level 4 is the base wall finish throughout unless noted otherwise.
3. Level 3: Walls to receive textured wall finish, unless otherwise indicated.
4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
5. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
6. Level 0: Temporary partitions.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.
2. Taping, filling and sanding is not required at base layer of double layer applications.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 TEXTURE FINISH

A. Apply primer prior to applying texture finish.

B. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions.

C. Texture Required: At rooms with Level 3 Finish..

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

B. Maximum Variation of Backer Board for Ceramic Tile from True Flatness: 1/4 inch in 10 feet in any direction.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The other Contract Documents complement the requirements of this section.

B. Other sections of this Specification may relate, and may impose additional work and/or additional materials upon this section. Contractor to coordinate any cross-referencing of Specification sections.

1.02 DESCRIPTION OF WORK

A. This work shall consist of providing project erosion and sedimentation control (ESC) in accordance with city, state and federal requirements, regardless of the specific ESC measures shown on the plans and details. The implementation of the ESC and the construction, maintenance, replacement, and upgrading of these ESC facilities is the responsibility of the Contractor until all construction is completed and approved and the permanent vegetation/landscaping is established.

1.03 STANDARD SPECIFICATIONS

A. Standard specifications referenced herein shall be the latest edition of the WSDOT/APWA Standard Specifications as prepared by the Washington State Department of Transportation and the American Public Works Association, Washington State Chapter (WSDOT/APWA). Technical specifications only, Division 1 and measurement and payment portions of the Standard Specifications do not apply.

B. Reference specifications shall be the City of Vancouver's Latest Edition of the General Requirements and Standard Details Manual (COV) and the Washington State Department of Ecology (DOE) Stormwater Management Manual for Western Washington, where the COV General Requirements shall take precedence.

1.04 ADDITIONAL PERMIT REQUIRED

~~A. Construction Stormwater General Permit (CSGP). A CSGP from the Washington State Department of Ecology related to stormwater runoff during construction will not be required as the site is fully infiltrated.~~

~~B. If the contractor allows discharge to cross property lines and enter waters of the state, the contractor is required to submit for and obtain the Construction Stormwater General Permit through Ecology including submitting the NOI, publishing the public notices and following all permit requirements.~~

A. Construction Stormwater General Permit. The project will require a Construction Stormwater General Permit from the Washington State Department of Ecology related to stormwater runoff during construction.

1. Engineer Responsibilities:
   a. Submit Notice of Intent (NOI). The notice of intent shall be submitted on or before the date of the first public notice.
   b. Publish the Public Notice.
   c. Prepare the Stormwater Pollution Prevention Plan (SWPPP).
2. Contractor Responsibilities:
   a. Submit Transfer of Coverage Form (for Complete Transfer) so that the Contractor is identified as the site operator.
   b. Comply with Standards as identified in the permit.
   c. Comply with the Monitoring Requirements as identified in the permit. Site inspections shall be conducted by a Certified Erosion and Sediment Control Lead (CESCL).
   d. Comply with Reporting and Recordkeeping Requirements as identified in the permit.
   e. Pay all permit fees assessed by the DOE as identified in the permit. Permit fees will continue to be assessed until the permit is terminated in accordance with the Notice of Termination requirements.

f. Comply with other permit requirements as identified in the permit, as applicable.
g. Implement a Stormwater Pollution Prevention Plan (SWPPP) as required by the permit. (SWPPP will be provided by the owner/engineer).
h. Upon completion of construction and final stabilization of the site, prepare and submit a Notice of Termination (NOT) form in accordance with the requirements of the permit.
i. Comply with all other requirements of permit coverage, including General Conditions, as well as any additional requirements imposed by the Department of Ecology (DOE) related to the permit.
j. Pay any penalties assessed by the DOE for violation of permit coverage.

PART 2 PRODUCTS

2.01 MATERIALS

A. All materials shall be in conformance with the requirements shown on the City of Vancouver standard erosion control details and the Department of Ecology.

PART 3 EXECUTION

3.01 INSTALLATION AND MAINTENANCE

A. Provide temporary erosion and sedimentation control (ESC) measures to prevent soil erosion and discharge of soil bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authority having jurisdiction and the sediment and erosion control contract drawings. Regardless of the specific ESC measures shown on the contract drawings, the Contractor is responsible to provide all required project erosion and sedimentation control measures necessary to address changing field and weather conditions, in accordance with city, state and federal requirements.

B. Contractor shall implement the recommendations of the Stormwater Pollution Prevention Plan (SWPPP) as required by the City of Vancouver and the Department of Ecology. The SWPPP will be provided to the contractor by the owner.

C. Erosion control as shown on the plans are the base recommendations, and are in no way intended to represent all of the potential erosion control measures that may be required during construction. Contractor shall be responsible for grading of temporary cut-off ditches, sedimentation ponds, sumps, Baker Tanks™, bypass pumping, and/or other means as required and necessary to control storm water runoff during construction so that no silt-laden water leaves the project site. All such measures shall be at Contractor's expense.

D. At no time shall more than one foot of sediment be allowed to accumulate within a trapped catch basin. All catch basins and conveyance systems shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.

E. Stabilized construction entrance(s) will be constructed at the beginning of construction. Locations shall be reviewed and approved by the Owner. These entrance(s) shall be maintained by the contractor of this project for the duration of the project. Additional measures may be required to ensure that all paved areas adjacent to the project are kept clean for the duration of the project.

F. Sediment fences, bio-bags, and other ESC measures shall be removed when they have served their useful purpose and when approved by the engineer, but not before the upslope area has been permanently stabilized. Upon completion of construction and full site establishment, remove erosion and sedimentation controls and restore and stabilize any areas that are disturbed during removal.

G. Construction and maintenance of graveled construction entrances, temporary sediment fences, and straw bale sediment barriers, and other erosion control work shall conform to City of Vancouver requirements.

H. All materials shall be in good physical condition to provide proper sediment retention.

I. Sediment fences and barriers shall be inspected by the contractor immediately after each rainfall and at least daily during prolonged rainfall. Inspect all other ESC facilities daily, and provide repair and/or

maintenance as necessary to ensure their continued functioning. Any required repairs shall be made immediately.

END OF SECTION