

# **PROJECT MANUAL**

## **FIVE FOUR**

**LEE'S SUMMIT – OLDHAM VILLAGE**  
**301 SW Oldham Parkway**  
**Lee's Summit, MO 64018**

October 2025

**Project Designer**  
**Shaw Hofstra + Associates**  
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Kansas City, MO 64108  
Phone: 816-421-0505

# **PROJECT MANUAL**

## **FIVE FOUR**

October 2025

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**Five Four**  
Lee's Summit – Oldham Village  
301 SW Oldham Parkway  
Lee's Summit, MO 64081

**PROJECT DIRECTORY**

October 2025

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**DISCLAIMER OF RESPONSIBILITY**

With regard to this Project, the professional whose personal seal and signature appear below assume responsibility only for the drawings, specifications, and other documents bearing the personal seal of the undersigned professional and disclaim any responsibility for all other plans, drawings, specifications, estimates, reports, or other documents or instrument relating to or intended to be used for any part or parts of this architectural or engineering project or survey which do not contain the personal seal of the undersigned professional.

CRAIG SHAW, AIA

SHAW HOFSTRA + ASSOCIATES



**END OF DISCLAIMER OF RESPONSIBILITY**

**SECTION 00400 – INFORMATION AVAILABLE TO BIDDERS**

**PART 1 - EXISTING REPORTS AND SURVEYS**

**1.1 SUBSURFACE INVESTIGATION**

- A. A copy of a geotechnical report with respect to the building site is included with this document:
  - 1. Title: Geotechnical Exploration Report
  - 2. CFS Engineers
  - 3. Date: November 19, 2024
  - 4. Prepared by: CFS Engineers
    - Contact: Jacob Engler, P.E.
    - a) 1100 W. Cambridge Circle Drive, Suite 700
    - b) Kansas City, KS 66103
    - c) Phone: 913-627-9040
- B. These reports, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract sum accruing to KRM., Inc.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

- A. Foundation: Building supported on shallow spread footing s/ slab on grade
- B. Pavement: Concrete
- C. Geo-tech work to be completed:
  - 1. 6.2 Subgrade Preparation
  - 2. 6.3 Shallow Foundations

**END OF SECTION 00400**



# Geotechnical Exploration Report

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## **OLDHAM VILLAGE LOT 4 – 54<sup>TH</sup> STREET**

Lee's Summit, Missouri  
CFS Project No. 24-5632

### Prepared For

Oldham Investors, LLC  
PO Box 24302  
Overland Park, Kansas 66283

November 19, 2024



Cook, Flatt & Strobel Engineers  
1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103  
[www.cfse.com](http://www.cfse.com)

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**One Vision. One Team. One Call.**



November 19, 2024

Oldham Investors, LLC  
PO Box 24302  
Overland Park, Kansas

Attn: David Olson

Re: OLDHAM VILLAGE LOT 4 – 54<sup>TH</sup> STREET | Lee's Summit, Missouri  
CFS Project No: 24-5632

Mr. Olson,


A subsurface exploration and an evaluation were performed at lot 4 of the planned Oldham Development project site located in Lee's Summit, Missouri to provide geotechnical engineering related recommendations for design and construction of the proposed project.

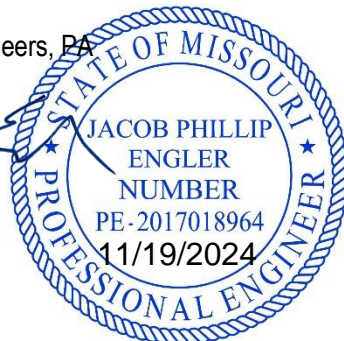
Exploratory soil borings have been drilled and a laboratory testing program was conducted on selected soil samples. The data has been analyzed based upon the project information provided by Oldham Investors, LLC.


The results of the exploration and analysis indicate that conventional spread and continuous wall footings appear to be a suitable foundation system for support of the proposed structure. Detailed analysis of subsurface conditions, any alternate foundation types, and pertinent design recommendations are included, herein.

We truly appreciate the opportunity to work on this project and are eager to continue providing geotechnical engineering services, as well as construction materials testing and inspections services as the project progresses. Please let us know if there are any questions or concerns.

Respectfully Submitted,  
Cook, Flatt & Strobel Engineers, PA

  
Jacob Engler, PE  
Geotechnical Engineer



  
Adam McEachron, PE  
Senior Geotechnical Engineer

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## **Appendix A: Figures**

*Figure 1 – Project Location*

*Figure 2 – Boring Location Plan*

## **Appendix B: Boring Logs**

# Geotechnical Exploration Report

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## OLDHAM DEVELOPMENT LOT 4 – 54<sup>TH</sup> STREET

Lee's Summit, Missouri

Project Number: 24-5632

November 19, 2024

## 1 INTRODUCTION

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### 1.1 PURPOSE

The purpose of this geotechnical exploration was to evaluate the underlying materials at Lot 4 of the planned Oldham Development which will be a 54<sup>th</sup> Street restaurant, and based upon this information, provide geotechnical engineering related recommendations for design and construction of the planned project. This exploration was performed in accordance with Cook Flatt & Strobel Engineers' P.A. (CFS) proposal number 24-182, dated October 9, 2024, and authorized by Oldham Investors, LLC.

This report includes geotechnical recommendations and considerations pertaining to site development, foundation support, concrete slab on grade and pavement construction. Also included in this report are earthwork, construction and drainage considerations associated with the proposed project.

### 1.2 SCOPE OF SERVICES

This exploration and analysis included an engineering reconnaissance of the planned site, a subsurface exploration as outlined below, a field and laboratory testing program, and an engineering analysis and evaluation of the subsurface materials.

The scope of services did not include any environmental assessment for wetlands or hazardous materials in the soil, surface water, groundwater, air, or surrounding area. Any statement in this report or on the boring logs regarding odors, colors or unusual or suspicious items is strictly for the information of the client.

### 1.3 GENERAL

The general subsurface conditions used in this analysis are based upon an interpolation of the subsurface data between the borings; varying conditions may be encountered between boring locations. If deviations from the noted subsurface conditions are encountered during construction, they should be brought to the attention of the Geotechnical Engineer.

The recommendations submitted for the proposed structure are based on the available soil information and the preliminary design details. Any revision in the plans for the proposed structure from those described in this report should be brought to the attention of the Geotechnical Engineer to determine if changes in the foundation recommendations are required.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, and professional advice contained, herein, have been presented after being prepared in accordance with generally accepted professional

engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

After the plans and specifications are complete, it is recommended that the Geotechnical Engineer be provided the opportunity to review the final design and specifications to verify that the earthwork and foundation recommendations are properly interpreted and implemented. Additionally, CFS should be allowed to perform construction inspections on any foundation elements of the project to validate these recommendations.

## 2 PROJECT DESCRIPTION

It is understood that the planned project comprises a new residential and commercial development in Lee's Summit, Missouri. The overall development will include convenience stores, restaurants, a fitness center, and an apartment building. CFS was provided with the August 7, 2024, revision of the civil engineering plans created by Engineering & Solutions. This report is specifically for Lot 4 of the development which will be a 54<sup>th</sup> Street restaurant. The restaurant will include two (2) pickleball courts and associated pavement and drive lanes.

ITEM	PARAMETER	
BUILDING TYPE	1-story, concrete slab on grade	
FINISH FLOOR ELEVATIONS (feet above sea level)	Estimate at 1031 based upon grading plan	
CUT & FILL QUANTITIES	-7 to -10 feet of cut	
LOADING	Column	Continuous Wall
	150 kips	3-5 kips per linear foot
PAVEMENT	Sidewalks & Pedestrian use	

*Table 1: Assumed Design Parameters*

If any changes to the project occur, please notify CFS to allow for a review of these changes and, if necessary, amend this report.

### 2.1 SITE LOCATION & SURFACE CONDITIONS

The overall development is in the southwest quadrant of the intersection of Missouri Highway 291 and Missouri Highway 50 in Lee's Summit, Missouri. The site is bound by Oldham Parkway to the north, which turns into Southwest Jefferson Street along the east border, Southwest Persels Road to the south, and a residential neighborhood to the west. The southeast side of the development extends outward to SW Market Street, as well.

Lot 4 is in the middle of the northern half of the development. The site is relatively level and concrete pavement covered.

### 2.2 SITE GEOLOGY

Soils in the greater Kansas City area are generally residual soils, alluvial deposits, or tills. Residual soils formed because of weathering of bedrock, or by weathering of sediments that were transported by water, ice, wind, or a combination of these. Regional soils derived from shale, limestone, and loess have high shrink-swell potentials. Major alluvial deposits occur along the Missouri and Kansas rivers and their tributaries. These consist of clay, sand, and gravel sized sediments. Northern parts of the city were glaciated during the early Pleistocene time resulting in till deposits. Surface bedrock in northeastern Kansas and northwestern Missouri generally consist of limestone and shale

(with sandstone found in prehistoric channels) arranged in nearly horizontal beds or layers that can be followed continuously over long distances. These bedrocks are part of the Pennsylvanian bedrock system.

### 3 SUBSURFACE EXPLORATION

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Based on the project information as outlined above, CFS Engineers conducted a field exploration to determine the underlying materials at the proposed project site and to establish their engineering characteristics.

#### 3.1 SCOPE OF WORK

This geotechnical exploration consisted of drilling three (3) borings with a planned depth of approximately 20 feet beneath existing site grade within the footprint of the planned structure. The borings were drilled to their planned depth or auger refusal, whichever occurred first. The boring locations can be seen on the Boring Location Plan which is included in [Appendix A](#).

The boring locations were determined in the field using measurements from existing landmarks and should be considered accurate only to the degree implied. The locations were established by Cook, Flatt & Strobel Engineers.

***The elevation of the ground surface shown on each test boring log was taken from Google Earth and should be considered accurate only to the extent implied.***

Boring logs representing the materials encountered in the borings are included in [Appendix B](#). The boring logs represent CFS Engineers' interpretation of the field logs combined with laboratory observations and testing of the samples. The stratification boundaries indicated on the boring logs were based on field observations, an extrapolation of information obtained by examining samples from the borings, and comparisons of soils and/or bedrock types with similar engineering characteristic. As such, the boundaries between subsurface strata should be expected to vary from the logs to some extent.

The depth to groundwater, if encountered, was recorded in each test boring during drilling and can be seen in [Section 3.5, Groundwater Conditions](#). After completion of drilling, sampling, and field testing, the excavations were backfilled with auger cuttings.

#### 3.2 DRILLING AND SAMPLING PROCEDURES

The auger borings were drilled using a truck mounted SIMCO 2400 drill rig equipped with a rotary head. 3.25-inch solid-stem augers were used to drill the holes. During drilling, field logs were created and maintained by CFS personnel to catalog the materials encountered.

Representative samples were obtained during drilling using split-barrel sampling procedures in general accordance with the procedures for "Standard Test Methods for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils" (ASTM D 1586).

Upon completion of drilling, the samples were then sealed and returned to CFS's laboratory for further examination, classification, and testing. The samples recovered were identified, classified, and evaluated by a Geotechnical Engineer.

#### 3.3 FIELD TESTS AND MEASUREMENTS

During the soil boring procedure, Standard Penetration Tests (SPT) were performed at pre-determined intervals to obtain the standard penetration value of the soil as outlined in the ASTM D1586 test method. The standard penetration

value (N) is defined as the number of blows of a 140-pound hammer falling 30 inches, required to advance the split-barrel sampler one foot into the soil. The sampler is lowered to the bottom of the previously cleaned drill hole and advanced by blows from the hammer.

The number of blows is recorded for each of three successive increments of six inches penetration. The "N" value is then obtained by adding the second and third incremental numbers. The results of the standard penetration test are shown on the Boring Logs and indicate the relative density of cohesionless soils and comparative consistency of cohesive soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

The Standard Penetration Test (SPT) was also used to evaluate the consistency of the in-situ materials. The N-values for the site's materials were found to range from six (6) to 50+ blows/foot.

### 3.4 SUBSURFACE CONDITIONS

The materials encountered in the test borings have been visually classified according to the Unified Soil Classification System (USCS). Specific subsurface conditions encountered—including field tests, lab tests, and water level observations—at the boring locations are also presented on the individual boring logs found in [Appendix B](#) of this report.

### 3.5 GROUNDWATER CONDITIONS

Groundwater was not encountered in the borings at the time of the investigation. Please note, the reported groundwater levels reflect the conditions observed at the time the borings were drilled. Groundwater levels should be expected to fluctuate with changes in grading, precipitation changes, and seasonal changes. The water levels included in this report do not indicate permanent groundwater conditions. Additionally, the materials encountered during this exploration are, generally, low permeable soils.

## 4 LABORATORY TESTING

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Upon completion of drilling, the samples were returned to CFS's laboratory located in Kansas City, Kansas for laboratory testing. A supplemental laboratory testing program was conducted to evaluate additional engineering characteristics of the in-situ soils necessary in analyzing the behavior of the support systems for the proposed building.

The laboratory testing program included the following tests:

- Supplementary visual classification (ASTM D2488) of all samples,
- Water content (ASTM D2216) of all samples, and

The results of the laboratory testing program can be seen in on the boring logs in [Appendix B](#). The Atterberg limits can be seen in the following table.

Based on the Atterberg limits which were run on neighboring lots, the overburden material is considered highly expansive. To limit the risk of differential slab movements, all concrete slabs on grade should be constructed in accordance with [Section 7.3, "Slab on Grade Recommendations"](#) of this report.

## 5 GEOTECHNICAL CONCERNS

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The following geotechnical concerns are based upon the subsurface materials encountered during this exploration and CFS's understanding of the project as described in [Section 2, "Project Description"](#) of this report. If any changes to

the planned structure's location, loading or elevations occur, CFS must be allowed to review these changes, and if necessary, issue amendments to this report and its recommendations.

1. *Undocumented Fill*: Undocumented fill was encountered in the upper eight (8) to 13 feet at the planned project site. Undocumented fill is any foreign material that was placed or dumped in an uncontrolled manner (i.e., no records of testing exist from the time of placement), and it is generally considered unsuitable for support of structures. However, CFS understands seven (7) to 10 feet of cut is scheduled at lot 4, which will remove most of the undocumented fill prior to construction. The remaining materials are considered suitable for support of traditional shallow foundation and slabs because of their previous loading conditions. If the cut amounts change, CFS should be consulted to review these recommendations.
2. *Expansive Clay Soils*: Expansive clay soils were encountered during this exploration. The on-site materials are NOT suitable for direct support of concrete slabs and/or concrete wall backfill. It is recommended that all walls be backfilled with open graded stone (such as No. 57 as referenced in ASTM C33) extending two (2) feet behind the wall for the entire height of the wall to within 12-inches of the surface to allow for proper drainage and relief of any hydrostatic pressure build-ups that may occur in the native fat clay. All slabs on grade should be supported by a minimum 24-in-thick mat of low volume change material (LVC) constructed in accordance with Section 7.3, "Slab on Grade Recommendations" of this report.

## 6 EARTHWORK & SITE DEVELOPMENT

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### 6.1 SITE PREPARATION

Prior to filling, the grass and topsoil should be stripped from all structural areas and be stockpiled for later use in landscape areas, or it should be wasted. Any trees and shrubs should be removed including the entirety of the root ball and root systems. The upper 12-inches of the subgrade should be moisture conditioned and recompact, as necessary, to provide a stable subgrade upon which to begin placement of engineered fill.

Upon completion of stripping and prior to filling, the newly exposed subgrade should be evaluated by a qualified professional for stability by means of proof rolling. The proof roll should be conducted using a fully loaded, tandem axle dump truck weighing more than 25 tons. Any soft or unsuitable areas identified during the proof roll should be corrected by means of additional moisture conditioning and recompact, or removal and replacement with an acceptable material.

### 6.2 FILL MATERIALS

All general and structural fill should be free of debris and defined by ASTM 2487 as CH, CL, ML, GW, GP, SM, SW, SC, and SP. The onsite soils tend to meet this requirement; however, please note that CH (fat clay) classification materials should NOT be used as structural fill within two (2) feet of the finished grade supporting the building slab and within ten (10) feet laterally outside of the building footprint. Fat clays (CH) with Liquid Limits of greater than 55 should not be used in the upper one (1) foot beneath the pavement without being treated with cement as outlined later in this report.

The on-site topsoil contains organic material and is unsuitable for use as structural fill. Unsuitable materials are those defined by ASTM 2487 as MH, OL, OH, and PT.



## 6.3 ENGINEERED FILL PLACEMENT

For the purpose of this report, engineered fill means fill placed in controlled layers and compacted and tested according to accepted geotechnical engineering practices to ensure that it meets the required specifications. Structural fill refers to any engineered fill placed within the footprint of the planned structures or pavements. Engineered fill materials should be free of organic matter. During placement, engineered fill materials should be within the specified moisture contents and compacted to the specified densities given below in Tables two (2) and three (3). Maximum dry density and optimum moisture content should be determined by the Standard Proctor test (ASTM D 698).

Fill should be placed in six (6) inch lifts (compacted thickness) in mass fill areas, and as needed to obtain the proper compaction in utility trenches and behind walls. Structural fill should extend a minimum of two (2) feet beyond any structure lines. Additionally, where slopes exist, engineered fill must be properly benched into the existing materials.

ENGINEERED FILL MATERIAL	MAXIMUM BELOW OPTIMUM	MAXIMUM ABOVE OPTIMUM
Lean Clay (CL)	-2%	+3%
Fat Clay (CH)	0%	+4%
Compacted Base Rock (i.e., MODOT Type 5, AB3 or equivalent)	NA	NA

Table 2: Recommended Moisture Ranges

LOCATION OR AREA	REQUIRED COMPACTION (%) (ASTM D 698, DRY DENSITY)	TESTING FREQUENCY 3 PER LIFT PER ...
Building Walkways	95%	20,000 sf
Retaining Walls	95%	1,000 sf
Trenches	95%	150 lf
Lawn or Unimproved Areas	92%	20,000 sf
Structural Fill (i.e., building and pavement subgrades)	95%	10,000 sf
Out-Parcels	95%	20,000 sf

Table 3: Compaction Requirements & Testing Frequency

A representative of the Geotechnical Engineer should monitor filling operations on a full-time basis. Enough density tests should be taken to verify that the specified compaction is obtained. See the table above for required testing frequency.

## 6.4 EXCAVATIONS & TRENCHES

All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) Standards for the Construction Industry (29 CFR Part 1926, Subpart P). Excavations at this site are *expected* to be made in "Type C" clayey soil. Soil types should be verified in the field by a competent individual.

All excavations should be kept dry during subgrade preparation. Storm water runoff should be controlled and removed to prevent severe erosion of the subgrade and eliminate free standing water. Subgrade that has been rendered unsuitable from erosion or excessive wetting should be removed and replaced with controlled fill.

Trenches should be excavated so that pipes and culverts can be laid straight at uniform grade between the terminal elevations. Trench width should provide adequate working space and sidewall clearances. Trench subgrade should be removed and replaced with controlled fill if found to be wet, soft, loose, or frozen. Trench sub-grades should be

compacted above 95% of the maximum dry density in accordance with ASTM D 698 at moisture contents between -3% to +3% of the optimum moisture content.

Granular bedding materials for pipes, such as well-graded sand or gravel, may be used provided that the bottom of the trench is graded so that water flows away from the structure.

Bedding material should be graded to provide continuous support beneath all points of the pipe and joints. Embedment material should be deposited and compacted uniformly and simultaneously on each side of the pipe to prevent lateral displacement. Compacted control fill material will be required for the full depth of the trench above the embedment material except in area landscape area with the compaction may be reduced to 90% Standard Proctor ASTM D 698. No backfill should be deposited or compacted in standing water.

Permanent slopes greater than 3 horizontals to 1 vertical should not be used unless additional testing and slope analysis is performed.

## 6.5 DRAINAGE AND DEWATERING

Normal seasonal weather conditions should be anticipated and planned for during earthwork. It is recommended that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

The site should be graded such that positive drainage (normally 2% minimum) is provided away from any structures. Where sidewalks or paving do not immediately adjoin the building, protective slopes of at least 5% for a minimum of 10 feet from the perimeter walls are recommended. Roof drains and downpours should also be directed away from the building. Open-graded stone is not recommended for use under sidewalks unless the stone is adequately drained to prevent collection of water under the walks.

The site should also be graded to avoid water flows, concentrations, or pools behind retaining walls, curbs, or similar structures. When swales are designed at the top of the walls, proper line and slope should be considered to avoid any flow down behind walls. Special attention is needed for sources of storm water from slopes, building roofs, gutter downspouts and paved areas draining to one point.

Perforated plastic pipes should be placed on the backfilled side of the walls near the bottom and day lighted. Six inches of open graded crushed rock wrapped with geo-textile fabric should be placed behind the walls up to a depth of two feet below the finished grade. As an alternative to the open graded crushed rock, a manufactured geo-composite sheet drain such as Mirafi G100N, Contech C-Drain, or equivalent, may be used in conjunction with the perforated pipe.

## 6.6 LANDSCAPING

Landscaping and irrigation should be limited adjacent to buildings and pavements to reduce the potential for large moisture changes. Trees and large bushes can develop intricate root systems that can draw moisture from the subgrade, resulting in shrinkage of the bearing material during dry periods of the year. Desiccation of bearing material below foundations may result in foundation settlement.

Landscaped areas near pavements and sidewalks should include a drainage system that prevents over saturation of the subgrade beneath asphalt and concrete surfaces. Drainage systems in irrigation areas should be incorporated into the storm drain system.

## 7 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

### 7.1 FOUNDATIONS RECOMMENDATIONS

Conventional spread and continuous wall footings are, generally, most economical when the existing soil conditions allow them to be found at shallow depths on existing materials. Based on the materials encountered during this exploration, it is CFS Engineers' opinion that the planned structure can be supported by a shallow foundation system, such as spread and/or trench footings bearing in clay soils. Please refer to the following table for recommended design parameters.

DESIGN PARAMETER	RECOMMENDED VALUE	COMMENTS
Allowable Bearing Capacity <sup>(1)</sup> (shallow foundations)	2,000 psf	Evaluated based on field and laboratory testing results <sup>(1)</sup> .
Recommended Bearing Material <sup>(2)</sup>	CLAY SOIL	Suitable bearing material required beneath entirety of foundation system <sup>(2)</sup> . CFS anticipates over excavations of up to three (3) feet may be necessary to achieve a suitable bearing condition.
Anticipated Total Settlement	< 1-inch	Maximum
Anticipated Differential Settlement	< 3/4 -inch	Maximum per 100 feet of linear footing
Minimum Recommended width	24 and 16 inches	Spread and trench, respectively
Minimum Recommended Depth	36-inches	Based on seasonal freeze-thaw cycles

(1) If over excavation of any footing is required to reach design bearing capacity, backfill of the footing should be done with lean concrete.

(2) A uniform bearing condition should exist beneath the entirety of the foundation system for a given structure. A representative of the Geotechnical Engineer should test the materials in the footing excavations to verify the material and design bearing pressure.

Table 4: Shallow Foundation Design Parameters

If over excavation of footings becomes necessary to achieve the desired bearing pressure or a uniform bearing condition, backfill of the footing should be done with lean concrete. Footings should be suitably reinforced to reduce the effects of differential movement that may occur due to variations in the properties of the supporting soils. Top and bottom reinforcing steel is recommended for continuous wall footings to reduce differential settlement due to possible varying bearing capacities of the existing fill soils.

Every effort should be made to keep the footing excavations dry as the soils will tend to soften when exposed to free water. Footing bottoms should be free of loose soil and concrete should be placed as soon as possible to prevent drying of the foundation soils.

## 7.2 SEISMIC ANALYSIS

The determination of the seismic class is based on ASCE Standard 7: Minimum Design Loads for Building and Other Structures. Based upon this information, the seismic properties of the soil were interpolated from the standard penetration test values. A Seismic Site Class “D” was determined for this site. In addition, there is no significant risk of liquefaction or mass movement of the on-site soils due to a seismic event.

## 7.3 SLAB ON GRADE RECOMMENDATIONS

In its current state, the overburden materials (i.e., Fat Clay) encountered during this exploration are unsuitable for direct support of the planned slab on grade. CFS recommends all concrete slabs on grade be supported by a minimum of 24-inches of Low Volume Change (LVC) material. LVC material should consist of KDOT AB3, crushed limestone screenings, or equivalent. A low volume change material is defined as a material with a liquid limit less than 45 and a plasticity index less than 25. The subgrade can be constructed as outlined below. Cut the subgrade to a minimum depth of 24-inches beneath the planned bottom of slab elevation. The exposed material at this depth should be moisture conditioned and re-compacted, as necessary, to pass a proof roll as specified in Section 6.1, “Site Preparation” of this report.

1. Twenty (20) inches of compacted LVC material should be placed atop the exposed slab subgrade. The LVC should be placed in lifts no greater than 8-inches-thick (compacted thickness) and compacted to 95% of the maximum dry density as determined by ASTM D698. Limestone based LVC material should be compacted at a moisture content sufficient to achieve the desired compaction.

(\*) Please note, in lieu of limestone based LVC, the on-site soils can be stabilized with Portland Cement mixed at a concentration of 5% by dry unit weight to a depth of 20-inches. See [Section 7.5.1](#) for more information on cement stabilization requirements.

2. A 4-inch-thick layer of open graded stone (ASTM C33 or equivalent material) should be placed atop the 20-inches of compacted LVC material to return the subgrade to the original bottom of slab elevation. The open-graded stone will ease construction and provide a capillary break between the LVC and concrete slab.

Please note, the pickleball courts subgrade should be designed by the court surface installer. CFS anticipates 24-inches of LVC will also be required beneath the courts.

If any trenching or excavation of the LVC layer occurs after the building pad has been established, all backfill material should comprise engineered fill and the LVC layer should be reestablished. A subgrade reaction modulus value of 150 psi/in can be used for 20-inches of compacted granular fill such as KDOT AB3, MODOT Type 5 or equivalent.

Every floor slab should be evaluated to determine if a vapor retarder under the concrete floor is required. The slab designer should refer to ACI 302 and/or ACI 360 for procedures regarding the use and placement of a vapor retarder.

To reduce the effects of differential movement, slabs-on-grade should not be rigidly connected to columns, walls, or foundations unless it is designed to withstand the additional resultant forces. Floor slabs should not extend beneath exterior doors or over foundation grade beams, unless saw cut at the beam after construction. Expansion joints may be used to allow unrestrained vertical movement of the slabs. The floor slabs should be designed to have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage. CFS suggests joints be provided at a minimum spacing of twelve (12) feet on center. For additional recommendations refer to the ACI Design Manual. The requirements for the slab reinforcement should be established by the designer based on experience and the intended slab use.

## 7.4 LATERAL EARTH PRESSURES

Lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient. If the foundation walls are rigidly attached to the building and not free to rotate or deflect at the top, CFS recommends designing the walls for the *at-rest* earth pressure coefficient. Walls that are permitted to rotate and deflect at the top can be designed for the *active* lateral earth pressure condition. Horizontal loads acting on shallow foundations are resisted by friction along the foundation base and by *passive* pressure against the footing face that is perpendicular to the line of applied force.

It is recommended that all walls be backfilled with open graded stone (such as No. 57 as referenced in ASTM C33) extending to two (2) feet behind the wall for the entire height of the wall to within 12-inches of the surface to allow for proper drainage and relief of any hydrostatic pressure build-ups that may occur in the native clay. The use of stone to backfill behind the walls will expedite construction, reduce potential settlement between the wall and the floor slab and lower the pressure induced on the wall from the backfill thus potentially reducing the thickness of the walls. A wrapped drainage pipe should be located at the base of the walls to facilitate removal of water.

MATERIAL	ACTIVE (K <sub>a</sub> )	PASSIVE (K <sub>p</sub> )	AT-REST (K <sub>o</sub> )	ALLOWABLE BASE FRICTION	UNIT WEIGHT (pcf)
Open-graded crushed limestone	0.27	3.69	0.43	0.47	130-140
In-situ lean clay soils	0.40	2.5	0.68	0.32	120-125
In-situ fat clay soils	0.49	2.04	0.66	0.24	120-125
Lean clay – conditioned and compacted	0.32	3.12	0.48	0.35	120-125
Fat clay/Weathered Shale – conditioned and compacted	0.45	2.2	0.63	0.27	120-130
Limestone Bedrock	-	-	-	0.55	140-150

Table 5: Earth Pressure and Friction Coefficients

These earth pressure coefficients do not include the effect of surcharge loads, hydrostatic loading, or a sloping backfill. Nor do they incorporate a factor of safety. Also, these earth pressure coefficients do not account for high lateral pressures that may result from volume changes when expansive clay soils are used as backfill behind walls with unbalanced fill depths. In addition, any disturbed soils that are relied upon to provide some level of passive resistance should be placed in lifts not exceeding six (6) inches in thickness and compacted to a minimum density of 95% of the Standard Proctor (ASTM D698) maximum dry density at a moisture content within +/- 3% of the optimum moisture content. It is recommended that a representative of CFS should verify the compaction of any such materials relied upon to provide passive pressure.

The actual earth pressure on the walls will vary according to material types and backfill materials used and how the backfill is compacted. If the backfill conditions are different than the ones used above, CFS should be notified so the recommendations can be modified. The buildup of water behind a wall will increase the lateral pressure imposed on below-grade walls. Adequate drainage should be provided behind any below grade walls as described in this report. The walls should also be designed for appropriate surcharge pressures such as adjacent traffic, interior building floor slab loads, and construction equipment.

## 7.5 PAVEMENT RECOMMENDATIONS – CITY OF LEE'S SUMMIT

CFS Engineers understand this project will be governed by the City of Lee's Summit's standard pavement sections for the planned traffic usage. Lee's Summit's standards will apply to both public and private streets. It is CFS's opinion that the city standard section is suitable for support of the anticipated traffic conditions. Please note, no ESAL values

or traffic data was available at the time of this report. CFS anticipates these streets will service primarily passenger car vehicles with the occasional trash truck and delivery truck usage.

## 8 GENERAL COMMENTS

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When the plans and specifications are complete, or if significant changes are made in the character or location of the proposed building, a consultation should be arranged to review the changes with respect to the prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

It is recommended that the services of Cook, Flatt & Strobel Engineers be engaged to test and evaluate the compaction of any additional fill materials and to test and evaluate the bearing value of the soils in the footing excavations.



# APPENDIX A

## Figures





1100 W. Cambridge Circle Dr, Ste 700  
Kansas City, Kansas 66103

Project: **OLDHAM VILLAGE LOT 4 - 54TH STREET RESTAURANT**

Project Location: Lee's Summit, MO

Client: Oldham Investors, LLC

Date: 11/19/2024

Project #: 24-5632

Comments:

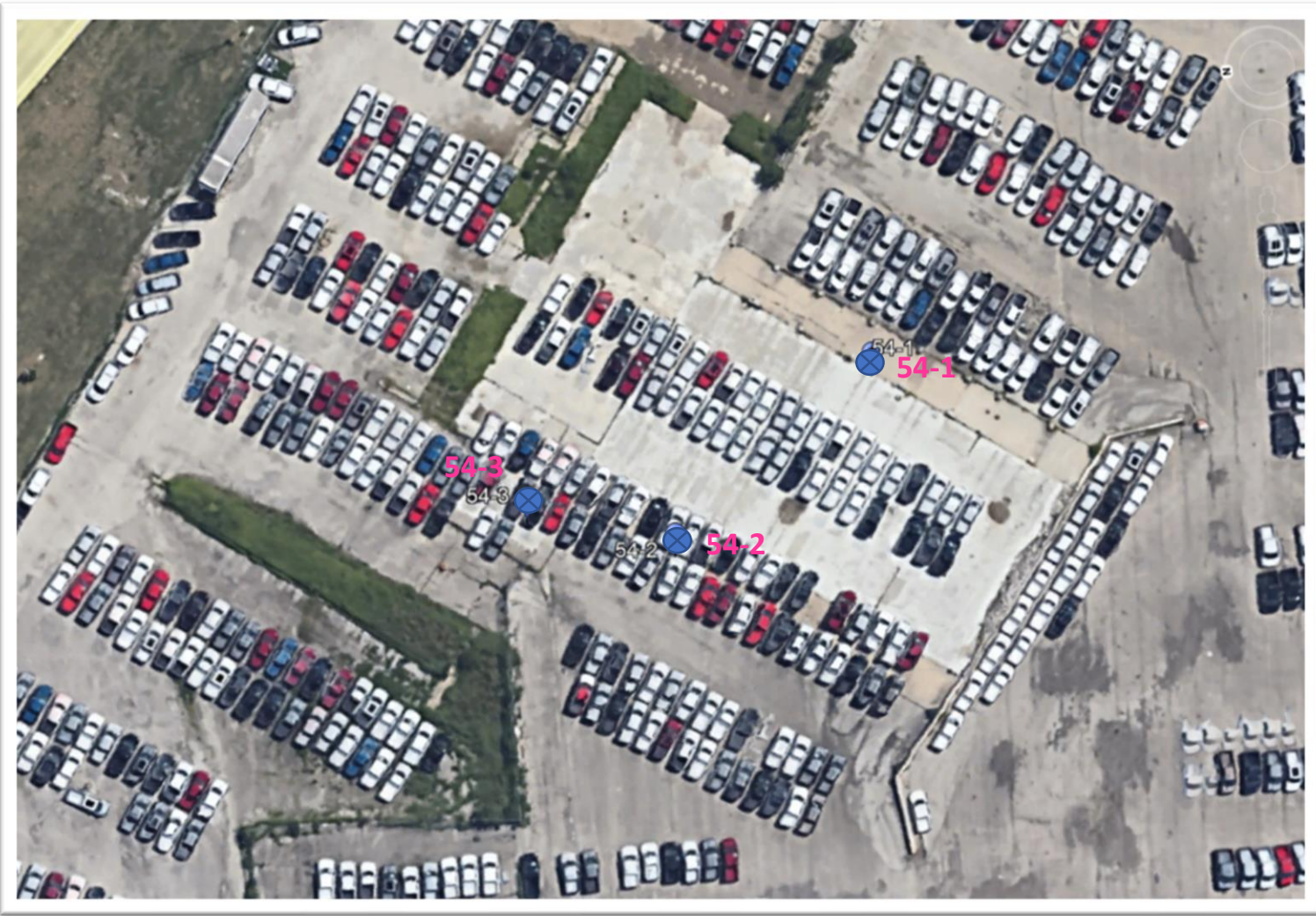
Figure 1:

**SITE LOCATION PLAN**



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1100 W. Cambridge Circle Dr, Ste 700  
Kansas City, Kansas 66103

Project: **OLDHAM VILLAGE LOT 4 -  
54TH STREET RESTAURANT**

Project Location: Lee's Summit, MO

Client: Oldham Investors, LLC

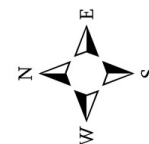
Date: 11/19/2024

Project #: 24-5632

Comments:

Figure 2:

**BORING LOCATION PLAN**

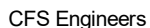


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# APPENDIX B

## Boring Logs



**PROJECT NAME** OLDHAM VILLAGE

**PROJECT LOCATION** Lee's Summit, MO

**GROUND ELEVATION** 1037 ft      **HOLE SIZE** 4 inches

**GROUND WATER LEVELS:**

**AT TIME OF DRILLING** --- No Free Water Encountered

**AT END OF DRILLING** --- No Free Water Encountered

**AFTER DRILLING** --- No Free Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONFINED COMP (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		2-inches of ASPHALT										
		LEAN CLAY, SANDY, (CL) blueish gray brown, moist, and tan with fragments (FILL)	SPT 1	100	5-3-5 (8)	1.75		16				
		FAT CLAY, (CH) gray, moist, mottled brown with gravel (FILL)	SPT 2	100	3-3-5 (8)	3.5		21				
5		(CH) roots and wood at 6'	SPT 3	100	2-4-5 (9)	3.5		25				
		FAT CLAY, (CH) grayish brown and brown, moist, stiff, with iron nodules	SPT 4	100	5-6-9 (15)	3.75		20				
10		SANDSTONE, unweathered, tan, with SHALE seams	SPT 5	100	13-24-39 (63)	2.5		18				
15												
		Refusal at 18.7 feet. Bottom of borehole at 18.7 feet.	SPT 6	100	50/3"	0		15				



CFS Engineers

CLIENT Oldham Investors, LLC

PROJECT NAME OLDHAM VILLAGE

PROJECT NUMBER 24-5632

PROJECT LOCATION Lee's Summit, MO

DATE STARTED 11/7/24

COMPLETED 11/7/24

GROUND ELEVATION 1039 ft

HOLE SIZE 4 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD Solid Flight Augers

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY CM

CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONFINED COMP (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		5-inches of CONCRETE (GP) 6-inches of BASE ROCK										
		FAT CLAY, (CH) brown and gray, moist, with sand and gravel (FILL)	SPT 1	28	2-3-6 (9)	2.25		21				
		(CH) dark brown and tan with SHALE fragments below 3'										
5		(CH) with gravel below 6'	SPT 2	83	4-4-6 (10)	2.5		18				
		(CH) with fine sand below 9'	SPT 3	100	4-4-5 (9)	2.5		25				
10		(CH) blueish gray and dark brown (POSSIBLE POND OR CREEK BED MATERIAL)	SPT 4	94	4-8-9 (17)	4.5+		15				
		(CH) blueish gray and dark brown (POSSIBLE POND OR CREEK BED MATERIAL)	SPT 5	94	4-4-6 (10)	2.75		25				
15												
20		SANDSTONE, moderately weathered to unweathered, blueish gray, wet	SPT 6	100	4-19-50/3"	1		37				

Bottom of borehole at 20.0 feet.

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CFS Engineers

CLIENT Oldham Investors, LLC

PROJECT NAME OLDHAM VILLAGE

PROJECT NUMBER 24-5632

PROJECT LOCATION Lee's Summit, MO

DATE STARTED 11/5/24

COMPLETED 11/5/24

GROUND ELEVATION 1039 ft

HOLE SIZE 4 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD Solid Flight Augers

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY CM

CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			UNCONFINED COMP (psf)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		3-inches of CONCRETE (GP) 15-inches of BASE ROCK										
		FAT CLAY, (CH) dark brown blueish gray, moist, and brown with gravel (FILL)	SPT 1	67	3-3-3 (6)	3.5		21				
5			SPT 2	94	3-3-4 (7)	2.75		27				
		(CH) dark brown below 6'	SPT 3	89	7-5-6 (11)	3		23				
10		FAT CLAY, (CH) grayish brown and blueish gray, moist, stiff, with trace of fine sand	SPT 4	89	3-5-6 (11)	3.25		23				
15			SPT 5	100	3-4-7 (11)	3.5		26				
20		LEAN CLAY, (CL) dark brown, moist, stiff, with organic odor	SPT 6	100	3-4-6 (10)	2.75		27				

Bottom of borehole at 20.0 feet.

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**SECTION 00700 – GENERAL CONDITIONS OF THE CONTRACT**

**PART 1 - GENERAL**

**1.1 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

- A.** Not bound in this Project Manual, but included as a part of the Contract Documents by reference:
  - 1.** THE AMERICAN INSTITUTE OF ARCHITECTS  
DOCUMENT NO. A201  
GENERAL CONDITIONS OF THE CONTRACT  
FOR CONSTRUCTION

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 00700**

## SECTION 01100 – SUMMARY

### PART 1 - GENERAL

#### 1.1 PROJECT IDENTIFICATION

- A. Project:
1. Owner: Kellan Restaurant Management, Inc., 1425 Swift Street, Suite 200, North Kansas City, MO 64116
  2. Project Location:  
  
**301 SW Oldham Parkway  
Lee's Summit, MO 64081**

#### 1.2 ARCHITECTURAL CONSULTANT IDENTIFICATION

- A. The Contract Documents issued for permit September 2025 and prepared by Shaw Hofstra + Associates.

#### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work consists of New Construction of approximately:
- 9,696** sq. ft. of Restaurant Space
  - 1,447** sq. ft. of Exterior Covered Patio
  - 1,209** sq. ft. of Delivery / Storage / Trash Enclosure
  - 6,843** sq. ft. of Exterior Recreational Courts Area
1. The Work includes but not limited to earthwork, landscaping, concrete, brick and wood stud walls, roofing membrane, wood trusses and TJI's, wood and metal doors and frames, hardware, glazing, interior finishes, plumbing, heating-ventilating-air-conditioning, electrical system, and lighting..
  2. **Owner will provide** the following: audio/visual equipment, security, exterior signage, logo etchings, (booths, tables, chairs and stools – installed by contractor), POS wire and Connections (contractor to provide conduit and pull strings), grease containment system tanks, CO2 canisters, and kitchen equipment (see note #4 below),
  3. **Owner will provide** the following through KRM National Account. Contractor will accept delivery and provide installation.



**B.**

- 1) Light Fixtures including dimmer, parking lot lights and poles
  - a) National Account: Villa Lighting, 314-633-0424
  - b) Other: To be approved by Owner.
- 2) Carpet (contractor to provide carpet adhesive)
  - a) National Account: Mohawk Group
- 3) Virginia Tile (contractor to provide grout per specifications and trim)
  - a) National Account: Virginia Tile, John Funk: 913-573-0578, [John.Funk@Virginiatile.com](mailto:John.Funk@Virginiatile.com)
- 4) Owner will provide and install the following. Contractor will coordinate work.
  - a) Urethane Poured Flooring System
  - b) Color: Dark Grey and Blue
  - b) National Account: To be selected
- 5) Owner will provide and contractor will install:
  - a) Sloan Model #AD-82.000.2, Station Basin and fixtures. One for Men's and one for Women's
  - b) National Account: Sloan, Kirk Gruben, Dallas, Texas 1-512-658-7459, [kirk.gruben@sloan.com](mailto:kirk.gruben@sloan.com) and Scott
- 6) Owner will provide and contractor will install:
  - a) Lennox RTUs
- 7) Owner will provide & contractor will install: Moss wall in entry
  - a) The Fat Plant Society, 4508 Genessee St, Kansas City, MO 64111, [thefatplantsociety@gmail.com](mailto:thefatplantsociety@gmail.com)
- 8) Owner's Vendor will provide & install Golf Simulator. Contractor will provide electrical connections.
  - a) National Account: HD Golf & HD Sportsuite, 51 Citation Dr., Vaughan, ON, Canada L4K 2Y8, Ryan Parnell 647-407-8856 [ryanp@hdgolf.com](mailto:ryanp@hdgolf.com)
- 9) ADA Accessible Counter National Account – Contractor to install
  - a) Grandberg USA [Robert@enemard!granberg.se](mailto:Robert@enemard!granberg.se)
- 10) Retractable Canopy – contractor to install
  - a) Shade FX
  - b) 855-509-5509 ext 215
- 11) Signage - contractor to coordinate
  - a) Apex Sign
  - b) Mitch Pense [mitch@apexsignkc.com](mailto:mitch@apexsignkc.com)
- 12) Audio Visual – Contractor to coordinate
  - a) Craft AV System, Inc.
  - b) Michael Jimenez [michael@craftavsystems.com](mailto:michael@craftavsystems.com)



- 13) Kitchen Equipment
  - a) TriMark
  - b) Gary Beatty Gary.beatty@trmarkusa.com
2. Owner, through kitchen equipment supplier (KES) will provide the following:
  - 1) All kitchen equipment to be provided supplied and installed by KES per equipment schedule on kitchen drawings,
  - a Kitchen hood – supplied by KES and installed by Mechanical contractor. All ducts supplied and installed by mechanical contractor.
  - b. All exhaust fans for kitchen are to be supplied by KES and to be installed by Mechanical contractor. Curbs supplied by KES and installed by roofing contractor.
  - c. 1 make up air unit – supplied by KES and installed my mech contractor. Curb supplied by KES and installed by roofing contractor.
  - d. 1 pre wire control – supplied by KES and installed by mech contractor. Mechanical contractor to complete all work above ceiling.
  - e. 1 dishwash pan leg duct – supplied by KES and installed by mech contractor
  - f. Ansul (fire suppression system) provided and installed by KES
  - g. Walk In Cooler and condensers – supplied and installed by KES – contractor to provide thru wall conduits for evaporator and condensate lines (see sheet A101)
  - h. Stainless steel panels, alum panels at kitchen hood and ss corner guards supplied and installed by KES. General contractor to coordinate.
3. **Contractor shall coordinate** the timing of the delivery of the kitchen equipment to the job site and provide an accessible route (hard surface - temporary gravel if required) from the street to the back door of the building.  
**Contractor will provide a fork lift to the kitchen equipment supplier to unload equipment from the truck.**
4. **Owner, through furniture supplier, will provide and deliver** to the back door of the new restaurant, the bases, table and booths. **The contractor will** take off the truck, set up, and install. The contractor will only install with Owner approved drawings of booths.
5. **General contractor (electrical sub-contractor) will provide and install** conduit and pull string as shown on electrical POS drawings. **Owner through vendor will install** POS cable and jacks. Contractor is to coordinate work.
6. **Plumber will provide exposed** beer conduits and accessories. Contractor to coordinate with Artic Concepts, Adrian Cruz [acruz@arcticconcepts.com](mailto:acruz@arcticconcepts.com)
7. Exterior wall signs and pylon sign – **provided and installed by Owner. Electrical sub-contractor will provide** electrical to wall signs and pylon sign. Sub-contractor to provide conduit to pylon sign for electrical. Contractor to coordinate with Owner's Sign Vendor.
8. **Audio/Visual will be provided and installed by Owner's vendor:** Michael Jimenez - [michael@craftavsystems.com](mailto:michael@craftavsystems.com)>[michael@craftavsystems.com](mailto:michael@craftavsystems.com) **Contractor to provide power for tvs** – Owner's vendor will provide uni-strut support over contractor supplied

parallam support. **Contractor to provide conduits** as noted on Sheet E501 to support audio/visual

9. **Plumber will provide and install** underslab soda lines – see sheet architectural drawings for routing.
10. **General contractor (electrical sub-contractor) will provide and install** conduit and pull string as shown on electrical POS drawings. **Owner through vendor will install** POS cable and jacks. Contractor is to coordinate work
11. **Owner will provide** “décor” items to be placed through-out the dining and bar area.

#### 1.4 DESIGN/BUILD WORK

1. Fire Sprinkler System
  - a. Contractor to provide compete system design in accordance with the NFPA-13 and to meet all governing codes and to submit design drawings and completed forms as required to obtain permit.
  - b. Provide security Knox box system to provide emergency access in the event of an emergency without excessive loss of time, life and or property. Verify with the city's fire marshal the type of Knox box system and locations (2 total) to install.
  - c. Fire sprinkler heads are to be clear of any obstructions. Coordinate with owner's large “décor” items hanging from structure above.
  - d. Fire sprinklers are required under all obstructions over 4'-0" wide, including vehicles hanging from ceilings.
2. Fire Alarm System
  - a. Contractor shall design, furnish and install a complete fire alarm system to meet governing codes and to submit design drawings and completed forms as required to obtain permit.
  - b. Noted fire alarm fixtures shown on electrical drawings are for basic purposes only and fire alarm contractor shall verify all fixtures required and locations to meet governing codes and permitted by city.
  - c. See Sheet E000, Item #17 under electrical Specifications for further information on Fire Alarm system.
3. Truss Submittal
  - a. The truss manufacturer shall provide and furnish pre-engineered wood truss drawings and calculations and shall be designed in accordance with the Plate's Institute natural design standard for metal plate connected wood truss construction. See sheet S1 item 15 (Timber and Wood Framing) for more information. Drawings are to be provided with an engineer's stamp for the state of Missouri.

#### 1.5 DEVELOPMENT REQUIREMENTS

- A. General Contractor is responsible for maintaining a clean site, including swept construction access roads, as well as trash collection (including that which blows off site onto adjacent properties).

- B. General Contractor is responsible for restoring all disturbed areas or damaged facilities to original condition. This includes areas disturbed by any utility construction on or off site.
- C. General Contractor shall contact the development and coordinate work. Contractor shall not cause any blocked roads to the shopping center.

## **1.6 CONTRACTS**

- A. Project will be constructed under a general construction contract.

## **1.7 BID INFORMATION**

- A. A Bid Form along with contract breakdown will be issued to contractor to complete for bidding.

## **1.8 USE OF PREMISES**

- A. General: Contractor shall coordinate use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Projects.

## **1.9 WORK UNDER OTHER CONTRACTS**

- A. Separate Contract: Owner will award a separate contract for performance of certain construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.
- B. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

## **1.10 SPECIFICATION FORMATS AND CONVENTIONS**

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

- a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01100**

## **SECTION 01140 - WORK RESTRICTIONS**

### **PART 1 - GENERAL**

#### **1.1 USE OF PREMISES**

- A. Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
  - 1. Limits: Confine constructions operations within construction site.
  - 2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to emergency vehicles at all times. Do not use these areas for parking and storage of materials.
  - 3. Contractors to use construction entrance as shown on civil drawings.
- B. Schedule deliveries to minimize use of driveways and entrances.

#### **1.2 OCCUPANCY REQUIREMENTS**

- A. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
  - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
  - 3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.
- B. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01140**

## **SECTION 01250 - CONTRACT MODIFICATION PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification Sections, apply to the section.

#### **1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements of handling and processing Contract modifications.
- B. Coordination: Related Sections include the following: Changes to the Contract may involve close coordination between this Section and Sections listed in subparagraphs below.
  - 1. Division 1 Section "Unit Prices" for administrative requirements for using unit prices.
  - 2. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

#### **1.3 MINOR CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

#### **1.4 PROPOSAL REQUESTS**

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 7 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - 5. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

## **1.5 CHANGE ORDER PROCEDURES**

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

## **1.6 CONSTRUCTION CHANGE DIRECTIVE**

- A. Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, only after Owner, Architect and Contractor has signed originals, for subsequent inclusion in a Change Order.
  - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  - 2. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION (Not Used)**

## **END OF SECTION 01250**

## **SECTION 01290 - PAYMENT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

#### **1.2 SCHEDULE OF VALUES**

- A. Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
  - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
  - 4. Format and Content: Use the Project Manual table of contents as a guide to establish line items for Schedule of Values. Provide at least one line item for each Specification Section.
  - 5. Identification: Include the following Project identification on the Schedule of Values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 6. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value.



- 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
7. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment. Provide several line items for principal subcontract amounts. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
8. Provide a separate line item for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
9. Provide separate line items for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
10. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other items that are not direct cost of work-in-place may be shown either as separate line items or distributed as general overhead expense.
11. Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

### **1.3 APPLICATIONS FOR PAYMENT**

- A. Applications for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
  2. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
  3. Payment Application Times: The date for each progress payment is the 15<sup>th</sup> day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days before the date for each progress payment.
  4. Payment Application Forms: Use AIA Document G702 and Continuation Sheets AIA Document G703 as form for Applications for Payment.
  5. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
    - a. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
    - b. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  6. Transmittal: Submit **3** signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required. Transmit each copy with a

- transmittal form listing attachments and recording appropriate information about application.
7. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
    - a. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
    - b. When an application shows completion of an item, submit final or full waivers.
    - c. Owner reserves the right to designate which entities involved in the Work must submit waivers.
    - d. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.
      - 1) Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
    - e. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
  8. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
    - a. List of subcontractors.
    - b. Schedule of Values.
    - c. Contractor's Construction Schedule (preliminary if not final).
    - d. Submittals Schedule (preliminary if not final).
    - e. List of Contractor's staff assignments.
    - f. Copies of building permits.
    - g. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
    - h. Certificates of insurance and insurance policies.
    - i. Performance and payment bonds.
  9. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
    - a. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
    - b. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
  10. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
    - a. Evidence of completion of Project closeout requirements.
    - b. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

- c. Updated final statement, accounting for final changes to the Contract Sum.
- d. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
- e. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
- f. AIA Document G707, "Consent of Surety to Final Payment."
- g. Evidence that claims have been settled.
- h. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01290**

## **SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General project coordination procedures.
  - 2. Conservation.
  - 3. Coordination Drawings
  - 4. Administrative and supervisory personnel.
  - 5. Project meetings.

#### **1.2 COORDINATION**

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - 4. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
    - a. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule.
  - 2. Preparation of the Schedule of Values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Pre-installation conferences.
  - 7. Project closeout activities.

- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

### **1.3 SUBMITTALS**

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
  - 1. Indicate relationship of components shown on separate Shop Drawings.
  - 2. Indicate required installation sequences.
  - 3. Refer to Division 15 Section "Basic Mechanical Materials and Methods" and Division 16 Section "Basic Electrical Materials and Methods" for specific Coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 10 days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and the phone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

### **1.4 ADMINISTRATIVE AND SUPERVISORY PERSONNEL**

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

### **1.5 PROJECT MEETINGS**

- A. Project Meetings, General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 7 (seven) days of the meeting.
- B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Architect, but no later than 7 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Critical work sequencing.
    - c. Designation of responsible personnel.
    - d. Procedures for processing field decisions and Change Orders.
    - e. Procedures for processing Applications for Payment.
    - f. Distribution of the Contract Documents.
    - g. Submittal procedures.
    - h. Preparation of Record Documents.
    - i. Use of the premises.
    - j. Responsibility for temporary facilities and controls.
    - k. Parking availability.
    - l. Office, work, and storage areas.
    - m. Equipment deliveries and priorities.
    - n. First aid.
    - o. Security.
    - p. Progress cleaning.
    - q. Working hours.
- C. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.

- 8) Temporary facilities and controls.
  - 9) Work hours.
  - 10) Hazards and risks.
  - 11) Progress cleaning.
  - 12) Quality and work standards.
  - 13) Change Orders.
  - 14) Documentation of information for payment requests.
3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01310**

## **SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION**

### **PART 1 - GENERAL**

#### **1.1 SUBMITTALS**

**A. Submit the following:**

1. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
  - a. Scheduled date for first submittal.
  - b. Specification Section number and title.
  - c. Submittal category (action or informational).
  - d. Name of subcontractor.
  - e. Description of the Work covered.
  - f. Scheduled date for Architect's final release or approval.
2. Contractor's Construction Schedule: Submit two printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.
3. Daily Construction Reports: Submit two copies at bi-weekly intervals.

**B. Field Condition Reports: Submit two copies at time of discovery of differing conditions.**

#### **1.2 COORDINATION**

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.**
1. Secure time commitments for performing critical elements of the Work from parties involved.
  2. Coordinate each construction activity with other activities and schedule them in proper sequence.

### **PART 2 - PRODUCTS**

#### **2.1 SUBMITTALS SCHEDULE**

- A. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.**



1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

## **2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule: Submit a Contractor's Construction Schedule within 10 days of date established for commencement of the Work.
1. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
  2. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
  3. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
  4. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
    - a. Phasing: Arrange list of activities on schedule by phase.
    - b. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
    - c. Work Restrictions: Show the effect on the schedule of limitations of continued occupancies, uninterruptible services, use of premises restrictions, and provisions for future construction.
    - d. Work Stages: Indicate important stages of construction for each major portion of the Work.
  5. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
  6. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

## **2.3 REPORTS**

- A. Daily Construction Reports: Prepare a daily construction report recording events at Project site, including list of subcontractors; high and low temperatures and general weather conditions; accidents; stoppages, delays, shortages, and losses; meter readings; orders and requests of authorities having jurisdiction; and equipment or system tests and startups.
- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

**PART 3 - EXECUTION**

**3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate Actual Completion percentage for each activity.
  4. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
    - a. Post copies in Project meeting rooms and temporary field offices.
    - b. When revisions are made, distribute updated schedules to the same parties and post in the same locations.

**END OF SECTION 01320**

## **SECTION 01330 - SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

#### **1.2 DEFINITIONS**

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

#### **1.3 SUBMITTAL PROCEDURES**

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- C. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Architect's receipt of submittal.
  - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Allow 15 days for processing each re-submittal.
- D. Identification: Place a permanent label or title block on each submittal for identification.
  - 1. Indicate name of firm or entity that prepared each submittal on label or title block.

2. Provide a space approximately **3 by 4 inches** on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Unique identifier, including revision number.
    - i. Number and title of appropriate Specification Section.
    - j. Drawing number and detail references, as appropriate.
    - k. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

## **PART 2 - PRODUCTS**

### **2.1 ACTION SUBMITTALS**

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Number of Copies: Submit four copies of each submittal, unless otherwise indicated. Architect will return two copies (Record set for Architect and Owner). Mark up and retain one returned copy as a Project Record Document.

- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Manufacturer's catalog cuts.
    - e. Wiring diagrams showing factory-installed wiring.
    - f. Printed performance curves.
    - g. Operational range diagrams.
    - h. Compliance with recognized trade association standards.
    - i. Compliance with recognized testing agency standards.
  
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
  - 1. Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Shopwork manufacturing instructions.
    - f. Templates and patterns.
    - g. Schedules.
    - h. Notation of coordination requirements.
    - i. Notation of dimensions established by field measurement.
  - 2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
  - 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1000 mm).
  
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project management and Coordination."
  
- E. Samples: Prepare physical units of materials or products, including the following:
  - 1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups.
  - 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
  - 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected.
  - 4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side.

5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
  6. Number of Samples for Initial Selection: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  7. Number of Samples for Verification: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
  8. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location.
- G. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."
- H. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- I. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."
- J. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."
- K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A.

## **2.2 INFORMATIONAL SUBMITTALS**

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
  2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- M. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- N. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

- O. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- P. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections.
- Q. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

### **PART 3 - EXECUTION**

#### **3.1 CONTRACTOR'S REVIEW**

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

#### **3.2 ARCHITECT'S ACTION**

- A. General: Architect will **not** review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect (and/or Engineer) will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

**END OF SECTION 01330**



## **SECTION 01400 - QUALITY REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Quality-control services do not include contract enforcement activities performed by Architect.

#### **1.2 DELEGATED DESIGN**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the 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.

#### **1.3 SUBMITTALS**

- A. Delegated-Design 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 the 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.
- B. Reports: Prepare and submit certified written reports that include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Ambient conditions at time of sample taking and testing and inspecting.
  - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 12. Name and signature of laboratory inspector.

13. Recommendations on retesting and reinspecting.

- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### **1.4 QUALITY ASSURANCE**

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

#### **1.5 QUALITY CONTROL**

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
1. Testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
  3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  5. Testing agency will retest and reinspect corrected work.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
  5. Do not perform any duties of Contractor.

- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field-curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION**

**3.1 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
- B. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION 01400**

## **SECTION 01420 – REFERENCES**

### **PART 1 - GENERAL**

#### **1.1 DEFINITIONS**

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved," when used in conjunction with Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
- D. "Indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations" include laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer" is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  - 2. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- J. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is

shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.

## **1.2 INDUSTRY STANDARDS**

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of the date of the Contract Documents.
- C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
  - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.
- D. Copies of Standards: Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.
- E. Abbreviations and Names: Abbreviations and acronyms are frequently used in the Specifications and other Contract Documents to represent the name of a trade association, standards-developing organization, authorities having jurisdiction, or other entity in the context of referencing a standard or publication. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of these entities. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION (Not Used)**

## **END OF SECTION 01420**

## **SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

#### **1.2 DEFINITIONS**

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

#### **1.3 USE CHARGES**

- A. General: Cost or use charges for temporary facilities and services (electrical, water) are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and personnel of authorities having jurisdiction.
- B. **Temporary utilities are to be provided until electric and water are changed over to FIVE FOUR's possession.**
- C. Included in temporary services: contractor to provide temporary electrical for Owner provided trailer facility which will be used in the last **(90 days)** of construction for purposes of hiring restaurant employees.

#### **1.4 QUALITY ASSURANCE**

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
  - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

#### **1.5 PROJECT CONDITIONS**

- A. Temporary Utilities: At the earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
  1. Keep temporary services and facilities clean and neat.
  2. Relocate temporary services and facilities as required by progress of the Work.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm) 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized steel bases for supporting posts.

### **2.2 EQUIPMENT**

- A. Field Offices: Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
  1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar non-absorbent material.
- D. Drinking-Water Fixtures: Drinking-water units, including paper cup supply.
  1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7.2 to 12.7 deg C).
- E. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.



- F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### **3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
  - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
  - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
  - 1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
  - 2. Connect temporary sewers to municipal system as directed by sewer department officials.
  - 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
  - 4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.
  - 1. Provide rubber hoses as necessary to serve Project site.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
  - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
    - a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
  - 3. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
    - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7.2 to 12.7 deg C).
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
  - 1. Maintain a minimum temperature of 50 deg F (10 deg C) in permanently enclosed portions of building for normal construction activities, and 65 deg F (18.3 deg C) for finishing activities and areas where finished Work has been installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
  - 1. Install electric power service underground, unless overhead service must be used.
  - 2. Install power distribution wiring overhead and rise vertically where least exposed to damage.
- H. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
  1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station.
  1. Provide additional telephone lines for the following:
    - a. In field office with more than two occupants, install a telephone for each additional occupant or pair of occupants.
    - b. Provide a dedicated telephone line for each facsimile machine and computer with modem in each field office.
  2. At each telephone, post a list of important telephone numbers, including police and fire departments, ambulance service, Contractor's home office, Architect's office, Engineers' offices, Owner's office, and principal subcontractors' field and home offices.
  3. Provide an answering machine, or voice-mail service on superintendent's telephone.
  4. Provide a portable cellular telephone for superintendent's use in making and receiving telephone calls when away from field office.

### **3.3 SUPPORT FACILITIES INSTALLATION**

- A. General: Comply with the following:
  1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
  2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
  3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
  4. Provide a reasonably level, graded, well-drained subgrade of satisfactory soil material, compacted to not less than 95 percent of maximum dry density in the top 6 inches (150 mm).
  5. Provide gravel paving course of subbase material not less than 3 inches (75 mm) thick; roller compacted to a level, smooth, dense surface.
  6. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate to support loads and to withstand exposure to traffic during construction period. Locate temporary roads and paved areas in same location as permanent roads and paved areas.

Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
  2. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 2 Section "Hot-Mix Asphalt Paving ."
- C. Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.
- D. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
  2. Prepare temporary signs to provide directional information to construction personnel and visitors.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements " for progress cleaning requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
- F. Common-Use Field Office: Provide an insulated, weathertight, heated and air-conditioned field office for use as a common facility by all personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings of 10 persons at Project site. Keep office clean and orderly.
1. Furnish and equip offices as follows:
    - a. Desk and four chairs, four-drawer file cabinet, a plan table, a plan rack, and bookcase.
    - b. Provide a room of not less than 240 sq. ft. (22.5 sq. m) for Project meetings. Furnish room with conference table, 12 folding chairs, and 4-foot- (1.2-m-) square tack board.
  2. Provide an electric heater with thermostat capable of maintaining a uniform indoor temperature of 68 deg F (20 deg C).
  3. Provide an air-conditioning unit capable of maintaining an indoor temperature of 72 deg F (23 deg C).
  4. Provide fluorescent light fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height. Provide 110- to 120-V duplex outlets spaced at not more than 12-foot (4-m) intervals, 1 per wall in each room.

### **3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- E. Site Enclosure Fence: Before construction operations begin, install enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
  - 1. Set fixed chain-link fence posts in compacted mixture of gravel and earth.
  - 2. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
  - 3. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- G. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Vertical Openings: Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood or similar materials.
  3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load bearing, wood-framed construction.
- I. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
    - a. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
  4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
  5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
  6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  7. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### **3.5 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
  2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may

have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

**END OF SECTION 01500**

## **SECTION 01600 - PRODUCT REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

#### **1.2 SUBMITTALS**

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use CSI Form 13.1A.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:



- a. Statement indicating why specified material or product cannot be provided.
  - b. Coordination information, including a list of changes or modifications needed to accommodate proposed substitution.
  - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
  - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 7 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
  - a. Form of Acceptance: Change Order.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

### **1.3 QUALITY ASSURANCE**

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

### **1.4 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
  1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Protect stored products from damage.

## **1.5 PROJECT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
  1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
  3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT OPTIONS**

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
  1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

**B. Product Selection Procedures: Procedures for product selection include the following:**

1. **Product:** Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
  - a. Substitutions may be considered, unless otherwise indicated.
2. **Manufacturer/Source:** Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
  - a. Substitutions may be considered, unless otherwise indicated.
3. **Products:** Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  - a. Substitutions may be considered, unless otherwise indicated.
4. **Manufacturers:** Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
  - a. Substitutions may be considered, unless otherwise indicated.
5. **Available Products:** Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Paragraph to obtain approval for use of an unnamed product.
6. **Available Manufacturers:** Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Paragraph to obtain approval for use of an unnamed product.
7. **Product Options:** Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Paragraph.
8. **Visual Matching Specification:** Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and

matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

- a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.
9. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
- a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
- C. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

## **2.2 PRODUCT SUBSTITUTIONS**

- A. Timing: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
- B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services.
  2. Requested substitution does not require extensive revisions to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. Substitution request is fully documented and properly submitted.
  5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  7. Requested substitution is compatible with other portions of the Work.
  8. Requested substitution has been coordinated with other portions of the Work.
  9. Requested substitution provides specified warranty.

## **2.3 COMPARABLE PRODUCTS**

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 01600**

## **SECTION 01700 - EXECUTION REQUIREMENTS**

### **PART 1 - GENERAL (Not Used)**

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

#### **3.2 PREPARATION**

- A. Existing Utility Information: Furnish information to local utility and/or Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

### **3.3 CONSTRUCTION LAYOUT**

- A. Verification: Before proceeding to lay out the Work, verify layout information shown of Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor and/or professional engineer to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels as needed to locate each element of Project.
  - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 3. Inform installers of lines and levels to which they must comply.
  - 4. Check the location, level and plumb, of every major element as the Work progresses.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

### **3.4 FIELD ENGINEERING**

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

### **3.5 INSTALLATION**

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
- D. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- E. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### **3.6 PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Contractor must always keep site clean where used by Public. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold materials for more than 7 days during normal weather or 3 days if the temperature is expected to rise above **80 deg F (27 deg C)**.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

### **3.7 STARTING AND ADJUSTING**



- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest. Owner is to be present during work.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties.
- D. Protection of Installed Construction: Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

### **3.8 CORRECTION OF THE WORK**

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

**END OF SECTION 01700**

## **SECTION 01770 - CLOSEOUT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, complete the following: (List items below that are incomplete in request)
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  2. Advise Owner of pending insurance changeover requirements.
  3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities.
  5. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
  6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  8. Complete startup testing of systems.
  9. Submit test/adjust/balance records.
  10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  11. Advise Owner of changeover in heat and other utilities.
  12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  13. Complete final cleaning requirements, including touchup painting.
  14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for Final Completion.

#### **1.2 FINAL COMPLETION**

- A. Preliminary Procedures: Before requesting final inspection to determine the date of Final Completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  - 2. Submit certified copy of Architect's Substantial Completion Inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

### **1.3 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

### **1.4 PROJECT RECORD DOCUMENTS**

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings. Submit electronic copy of construction drawing record set.
  - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  3. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

## **1.5 OPERATION AND MAINTENANCE MANUALS**

- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows: (Submit set to Architect for Owner).
1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
  2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

## **1.6 WARRANTIES**

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated. (Submit to Architect for Owner.)
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

## **PART 2 - PRODUCTS**

## **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

## **PART 3 - EXECUTION**

### **3.1 DEMONSTRATION AND TRAINING**

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Provide instructors experienced in operation and maintenance procedures.
  - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.

### **3.2 FINAL CLEANING**

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution regulations.
  - 1. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 2. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove construction equipment and surplus material from Project site.
    - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains.
    - f. Remove debris and surface dust from limited access spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces; shampoo if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken transparent materials. Polish mirrors and glass.
    - j. Remove labels that are not permanent.
    - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored.

- 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
  - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication and foreign substances.
  - m. Clean plumbing fixtures to a sanitary condition, free of stains.
  - n. Replace disposable air filters and clean permanent air filters.
  - o. Clean light fixtures, lamps, globes, and reflectors. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- B. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

**END OF SECTION 01770**

## **SECTION 02300 – EARTHWORK**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Geotechnical report included in project manual.

#### **1.2 SUMMARY**

- A. Site work shall be bid per recommendations of Geotechnical Exploration recommendations.
  - 1. Prepared by: CFS Engineers (Specification Section 00400 – Information Available To Bidders).
    - a. Contact: Jacob Engler, P.E.
      - a) 1100 W. Cambridge Circle, Suite 700
      - b) Kansas City, Kansas 66103
      - c) Phone: 913-627-9040
- B. Section 00400 – Information Available To Bidders.
- C. This Section includes the following:
  - 1. Preparing and grading sub-grades for slab-on-grade.
  - 2. Excavation and back-filling for buildings and structures.
  - 3. Drainage and moisture-control fill course for slabs-on-grades.
  - 4. Excavating and back-filling trenches within building lines.
  - 5. Subsurface drainage backfill for walls and trenches.
  - 6. Preparing and grading of retaining walls.
- D. Related Sections: The following Sections contain requirements that relate to this Section.
  - 1. Division 3 Section 03300 - Cast-in-Place Concrete for concrete encasings, cradles, and appurtenances for utility system.

#### **1.3 DEFINITIONS**

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse of disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- C. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.

- D. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.
- E. Structures: Buildings, footings, slabs, or other man-made stationary features constructed above or below ground surface.
- F. Utilities include on-site underground pipes

#### **1.4 QUALITY ASSURANCE**

- A. Codes and Standards: Perform earthwork complying requirements of authorities having jurisdiction.
- B. Testing and Inspection Service: General Contractor will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.

#### **1.5 PROJECT CONDITIONS**

- A. Existing Utilities: Retain an inspection service to verify existence of underground utilities (or lack thereof).
  - 1. Provide notice to the Architect and receive written notice of how to proceed in event of unforeseen underground utility.

### **PART 2 - PRODUCTS**

#### **2.1 SOIL MATERIALS**

- A. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- B. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
- C. Backfill and Fill: Satisfactory soil materials.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Engineered Fill: Subbase or base materials.
- F. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.



- G. Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Protect subgrades and foundation soils against freezing temperatures of frost. Provide protective insulating materials as necessary.
- B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### **3.2 DEWATERING**

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

### **3.3 EXCAVATION**

- A. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.
- B. Explosives: Do not use explosives.

### **3.4 STABILITY OF EXCAVATIONS**

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

### **3.5 EXCAVATION FOR STRUCTURES**

- A. See recommendations from Rone Engineering.

### **3.6 EXCAVATION FOR BUILDING SLAB-ON-GRADE**

- A. See recommendations from Rone Engineering.

### **3.7 APPROVAL OF SUBGRADE**

- A. Notify Architect when excavations have reached required subgrade.

- B. When Architect determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
  - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

### **3.8 UNAUTHORIZED EXCAVATION**

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect.

### **3.9 STORAGE OF SOIL MATERIALS**

- A. Stockpile excavated materials acceptable for backfill and fill soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### **3.10 BACKFILL**

- A. Backfill excavations promptly, but not before completing the following:
  - 1. Acceptance of construction below finish grade including, where applicable, foundation drains, damp-proofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for record documents.
  - 3. Testing, inspecting, and approval of underground utilities.
  - 4. Concrete formwork removal.
  - 5. Removal of trash and debris from excavation.
  - 6. Removal of temporary shoring and bracing, and sheeting.
  - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

### **3.11 MOISTURE CONTROL**

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2-percent of optimum moisture content.
  - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.

### **3.12 COMPACTION**

- A. Place backfill and fill materials in layers not more than 4-inches in loose depth, compact by hand operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations, Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557:
  - 1. Under structures, building slabs, steps, and pavements, compact the top 12-inches below subgrade and each layer of backfill or fill material at 95-percent maximum dry density.

### **3.13 DRAINAGE FILL**

- A. Under slabs-on-grade, place drainage fill course on prepared subgrade.
  - 1. Compact drainage fill to required cross sections and thickness.
  - 2. When compacted thickness of drainage fill is 6-inches or less, place materials in a single layer.
  - 3. When compacted thickness of drainage fill exceeds 6-inches thick place materials in equal layers, with no layer more than 6-inches thick nor less than 3-inches thick when compacted.

### **3.14 FIELD QUALITY CONTROL**

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

### **3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

**END OF SECTION 02300**

## **SECTION 02361 - TERMITE CONTROL**

### **1.1 GENERAL**

- A. Definitions: As follows:
  - 1. EPA: Environmental Protection Agency.
  - 2. PCO: Pest control operator.
- B. Submittals: Treatments and application instructions, including EPA-Registered Label, special warranties, and the following:
  - 1. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
    - a. Date and time of application.
    - b. Moisture content of soil before application.
    - c. Brand name and manufacturer of termiticide.
    - d. Quantity of undiluted termiticide used.
    - e. Dilutions, methods, volumes, and rates of application used.
    - f. Areas of application.
    - g. Water source for application.
- C. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- D. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.
  - 1. Meet all city and state codes and requirements.**
- E. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.
- F. General Warranty: Special warranty specified shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- G. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites for three years from date of Substantial Completion. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

### **1.2 PRODUCTS**

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

### **1.3 EXECUTION**

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
  - 1. Slabs-on-grade and basement slabs.
  - 2. Foundations.
  - 3. Crawlspace: Soil under and adjacent to foundations. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
  - 4. Masonry: Treat voids.
  - 5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

**END OF SECTION 02361**

**SECTION 02768 - DECORATIVE CEMENT CONCRETE PAVEMENT**

**PART 1 - GENERAL**

**1.1 SUMMARY**

A. Section Includes:

1. Integrally colored concrete pavement
2. Antiquing Release Color
3. STAMPED concrete pavement
4. Cure and Seal

**1.2 SUBMITTALS**

- A. Submit according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: For each product indicated.
- C. Mix Designs: For each type of integrally-colored concrete mix required and antiquing release color.
- D. Qualification Data: For Installer and manufacturer specified in Quality Assurance Article, including names and addresses of completed projects, architects, and owners.
- E. Material Test Reports: From testing agency indicating compliance of concrete materials, reinforcing materials, admixtures, and similar items with requirements.

**1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: Two year's experience with projects of similar scope and quality.
- B. Field Samples: Locate at site and obtain approval before start of final work. Field samples shall be minimum 4 by 4 feet full thickness.
  1. Demonstrate range of finishes and workmanship, including curing procedures.
  2. Approved field samples set quality standards for comparison with remaining work.
  3. Remove field samples when directed.
- C. Preinstallation Conference: Conduct conference at site to comply with requirements of Division 1 Section "Project Meetings."

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original packaging with labels intact.
- B. The store in clean, dry and protected location, according to manufacturer's requirements.

**PART 2 - PRODUCTS**

**2.1 FORMS**

- A. Comply with requirements of Division 3 Section “Cast-in-Place Concrete

**2.2 COLOR MATERIALS**

- A. Color material
  - 1. Product: Prism
  - 2. Colors: Deep Coal – Provide 3 bags of color for every yard of concrete
- B. Liquid Release Agent: Clear, evaporating formulation that facilitates release of stamp mats and texture rollers from colored concrete.
  - 1. Product: Butterfield antique release colors
  - 2. Color: Dark Charcoal

**2.3 IMPRINTIG TOOLS**

- A. Stencils: Moisture-resistant paper stencils, designed for use on plastic concrete.
  - 1. Manufacturer: Proline
  - 2. Pattern: Roman Slate
  - 3. Joint pattern to be expressed by a darker color

**2.4 ADMIXTURES**

- A. Do not use calcium chloride or admixtures containing calcium chloride.

**2.5 CURING AND SEALING MATERIALS**

- A. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 309, non-yellowing, VOC-compliant, clear liquid.
  - 1. Product: Elite Crete or Butterfield – Clear Guard Cure and Seal with non-slip additive
  - 2. Finish: Satin
- B. Slip-Resistive Additive: Finely graded aggregate or polymer additive designed to add to sealer for slip-resistant surface.

**2.6 INTEGRAL CONCRETE MIXES**

- A. Comply with Division 3 Section “Cast-in-Place Concrete: and as follows:
  - 1. Minimum Portland Cement Content: Five sacks of cement per cubic yard.
  - 2. Maximum Slump: 4 inches.
  - 3. Air Content: 6 percent plus or minus 1 percent.
- B. Add integral concrete colorant according to manufacturer's instructions.
- C. Maintain mix characteristics for all concrete required to have matching finish.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine subgrade and sub base for compliance with requirements.
- B. Do not proceed with decorative cement concrete pavement until unacceptable conditions are corrected.

### **3.2 FORMWORK**

- A. Comply with requirements of Division 2 Section "Cement Concrete Pavement".

### **3.3 CONCRETE PLACEMENT**

- A. Comply with requirements of Division 3 Section "Cast-in-Place Concrete.
- B. Do not add water once placing has begun. Do not retemper concrete that has started to set.

### **3.4 STAMPING**

- A. Cut stencils to slab width and lay on wet concrete. Overlap mortar joint on trailing edge of each section of stencil onto leading mortar joint of previous section.
- B. Slightly embed paper stencil into concrete by rolling with stencil roller.
- C. Trim stencils to fit slab and special patterns..
- D. Remove stencils when concrete has sufficiently cured to bear weight. Do not leave stencils in concrete overnight.
- E. Remove debris with mechanical blower before applying curing compound. If pigmented-powder release agent is applied, remove debris after interval recommended by manufacturer and according to manufacturer's instructions. Pressure wash surfaces according to manufacturer's instructions without damaging decorative concrete.

### **3.5 FINISHING**

- A. To obtain mottled look as owner's photograph, provide a wash off of the antiquing releasing agent to obtain proper look.

### **3.6 JOINTS**

- A. Comply with requirements of Division 2 Section "Cement Concrete Pavement".

### **3.7 CURING AND SEALING**

- A. Protect decorative cement concrete pavement from prematurely drying and excessive cold or hot temperatures.



- B. Cure decorative cement concrete pavement according to manufacturer's instructions.
- C. Curing and Sealing Compound: Apply uniformly in continuous operation by sprayer or short nap roller according to manufacturer's instructions. After initial application is dry and tack free, apply a second coat.
  - 1. Do not over apply or apply in a single heavy coat.
  - 2. Thoroughly mix slip-resistant additive in sealer according to manufacturer's instructions. Stir occasionally to maintain uniform distribution of additive.
  - 3. Verify adequacy of slip resistance before opening up surfaces to traffic.
- D. Do not cover concrete with plastic sheeting.

Delete optional text below for exterior concrete pavement or interior concrete floor that is not required.

### **3.8 PAVEMENT TOLERANCES**

- A. Comply with requirements of Division 2 Section "Cement Concrete Pavement".

### **3.9 REPAIRS AND PROTECTION**

Delete optional text below for exterior concrete pavement or interior concrete floor that is not required.

- A. Repair damaged decorative cement concrete pavement according to manufacturer's instructions.
- B. Clean spillage and soiling from adjacent construction according to manufacturer's instructions.
- C. Protect decorative cement concrete pavement from damage or deterioration until date of Substantial Completion.

**END OF SECTION 02768**

**SECTION 03300 - CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. SEE STRUCTURAL SHEET S1 FOR MORE DETAILED SPECIFICATIONS.**

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.

**1.3 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

**PART 2 - PRODUCTS**

**2.1 FORM-FACING MATERIALS**

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

## **2.2 STEEL REINFORCEMENT**

- A. See Sheet S1
- B. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. See sheet S1
- C. Normal-Weight Aggregates: See Sheet S1
- D. Water: ASTM C 94/C 94M and potable.
- E. Air-Entraining Admixture: See Sheet S1

## **2.3 VAPOR RETARDERS**

- A. Plastic Vapor Retarder: See Sheet S1

## **2.4 EXPANSION MATERIALS**

- 1. Semi-rigid closed-cell polypropylene Expansion joint filler
  - a. Manufacturer: Nomalex

## **2.5 CURING**

- A. Curing compound must meet ASTM C 309, Type 1-D (fugitive dye) or Type 2 (white pigmented). For surfaces that are floors that are to receive adhesive applications of resilient flooring, only styrene acrylate or chlorinated rubber compounds meeting Class B requirements can be used. Type 1-D curing compound shall have the reflective requirements of C 309 waived. AASHTO M 182 for burlap and cotton mat is cited. Curing water shall be fresh, clean, potable, and free of injurious amounts of oil, acid, salt, or alkali, except that non potable water may be used if it meets the requirements of USACE specification CRD-C 400.

Concrete shall be protected from premature drying, extremes in temperature, rapid temperature change, mechanical damage or effects of flowing water throughout the curing period. The curing period is 3 days for concrete containing Type III cement (ASTM C 150) and 7 days for other concrete.

Apart from the exceptions on compatibility with coatings (described above) moist curing shall be used on areas that are to receive hardeners, paint, or other applied coating. Concrete containing silica fume shall be cured by fog misting during finishing, followed immediately by continuous moist curing.

For moist curing, wooden forms are to be kept continuously wet. In hot weather, non-supporting steel forms shall be loosened and the formed surface kept wet. Burlap and mats shall be completely saturated before application to the concrete surface. When ponding is used, temperature of the water shall not be more than 10 °C cooler than the concrete.

On slabs, curing compound shall be applied as soon as bleed water disappears, with tops of joints sealed to prevent curing compound from seeping in and moisture being lost. Curing compound shall be applied in a two-coat continuous operation at a minimum pressure of 500 kPa with an application rate of not more than 10 m<sup>2</sup>/L for each coat, with the second coat applied perpendicular to the first. If it rains within 3 h, the entire application must be redone. Surfaces on which nonpigmented curing compound are used shall be shaded from direct sun for the first 3 days.

Except for plastic coated burlap, impervious sheeting alone shall not be used for curing. Such impervious sheeting shall only be used on horizontal or nearly horizontal surfaces. Additional guidance is given on details of use.

Moist curing inspection shall occur once per shift or not less than two times per day, including nonworkdays. Moisture condition is recorded. If an area is found to be dry, corrective action is taken and curing extended 1 day. When curing compound is used, the contractor verifies that it is properly mixed. At end of each operation, the contractor shall estimate the quantity of curing compound used and the surface area covered. When the calculated rate of application is below that specified (no tolerance given) or is not uniform, the entire surface must be sprayed again. Sheets are inspected once per shift and once per day on nonworkdays, noting conditions of sheets, laps, and joints. If deficiencies are found, they are repaired and curing extended by 1 day. Reports are completed in writing daily, and weekly summaries are prepared

## **2.6 RELATED MATERIALS**

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

## **2.7 CONCRETE MIXTURES**

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Proportion normal-weight concrete mixture as follows:
  - 1. See Sheet S1

## **2.8 FABRICATING REINFORCEMENT**

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## **2.9 CONCRETE MIXING**

- A. Ready-Mixed Concrete: See Sheet S1

**PART 3 - EXECUTION**

**3.1 FORMWORK**

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

**3.2 EMBEDDED ITEMS**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

**3.3 VAPOR RETARDERS**

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
  - 1. Lap joints **6 inches (150 mm)** and seal with manufacturer's recommended tape.

**3.4 STEEL REINFORCEMENT**

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

**3.5 JOINTS**

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

**3.6 CONCRETE PLACEMENT**

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Comply with ACI 306.1.
- D. Hot-Weather Placement: Comply with ACI 301.

**3.7 FINISHING FORMED SURFACES**

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

**3.8 FINISHING FLOORS AND SLABS**

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  - 1. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
- C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

**3.9 CONCRETE PROTECTING AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - 2. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

**3.10 CONCRETE SURFACE REPAIRS**

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

**3.11 FIELD QUALITY CONTROL**

- A. Testing and Inspecting: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
  - 1. Testing Services: Tests shall be performed according to ACI 301.

**END OF SECTION 03300**

**SECTION 04700 – MANUFACTURED MASONRY**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section includes: Manufactured stone veneer and stone trim, and application materials.

**1.2 SUBMITTALS**

- A. Shop drawings for Manufactured Masonry Trim Units in the form of setting drawings showing sized, profiles, locations, including anchorage, accessories, finish colors, patterns, and textures.

**1.3 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- B. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items to prevent corrosion and accumulation of dirt and oil.

**1.5 PROJECT CONDITIONS**

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24-inches down both sides and hold cover securely in place.



- B. Stain Prevention: Prevent mortar, and soil from staining the face of masonry to be left exposed. Immediately remove mortar, and soil that come in contact with masonry.
  - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surfaces.
  - 2. Protect sills, ledges and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as, similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or material mixed or coated with ice or frost. Do not build on frozen sub-grade or setting beads. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements.
  - 1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
    - a. 40 to 32 deg F (4 to 0 deg C): Heat mixing water on sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C).
    - b. 32 to 25 deg F (0 to -4 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperature between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry.
    - c. 25 to 20 deg F

## **1.6 WARRANTY**

- A. Special Warranty: Provide manufacturer's standard limited and ambient temperature in area of installation at minimum 40 degrees F (4 degrees C) prior to, during, and for 48 hours following installation.

## **1.7 MAINTENANCE**

- A. Extra Materials: Furnish extra manufactured stone material in a variety of shapes and sizes in quantity equal to three percent of the installed stone.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. MANUFACTURER:
    - a. **Coronado Stone Products**
      - 1) Dry stack typical
      - 2) Fully grouted for front and side planter.
      - 3) Fully grouted for interior walls
    - b. Series / Color: **Pro Ledge / Huron**
      - 1) Verify grout color with architect

## **2.2 RELATED MATERIALS**

- A. Weather Resistant Barrier: Tyvek wrap for Cultured Stone application.
- B. Metal Lath: 2.5 lb. galvanized expanded metal lath, 18 ga woven wire mesh, 3.4 lb. galvanized expanded rib lath.
- C. Fasteners Into wood studs: Minimum 0.120 inch shank diameter galvanized nails or staples of sufficient length to penetrate 1-3/8" minimum into the stud.
- D. Mortar: Premixed Type N or mortar mixed using components and proportions following manufactured masonry manufacturer's installation instructions. Comply with ASTM C 270. Mortar color: Iron oxide pigments

## **PART 3 - EXECUTION**

### **3.1 PREPARATION & INSTALLATION**

- A. Below are the 5 basic layers involved
  - original surface of wood, durock or cmu on building or planter.
  - 2 layers of water-resistant sheeting (Tyvek)
  - Expanded metal lath to give structural support to all layers
  - Scratch Coat surface (1/2-3/4" coat of mortar that is roughed up with a rake when it is semi-setup to allow better adhering with setting bed)
  - Setting bed- mortar applied to either the surface of the scratch coat or the back of the brick (either or both can be used)

Use either N or S type mortar and avoid O or M (more Portland cement and not too much aggregate determine type and denote strength of product)

Issue can result from either mortar mixed too dry, not enough mortar applied or temperature issues during install.

- Heat is defined at 90 degrees and 8 mph wind or 100 degrees no wind.
- Cold temps due to freezing can cause ice crystals and mortar not to cure correctly.

When working in heat conditions the temps can cause the mortar to dry and may need to have water sprayed on scratch coat surface and the back of the stone to rehydrate get a proper bond of the stone and the mortar. Most common issue typically come from the mortar being too dry or not enough mortar applied on the setting bed. Contractor should be able to see mortar oozing out of all edges of the stone and not be able to see much if any of the scratch coat or setting bed is too thin. Personal preference but installer can either spread the setting bed on the scratch coat or they can individually butter each stone and press it into place or a combination of both.

### **3.2 CLEANING**

- A. Clean manufactured masonry in accordance with manufacturer's installation instructions.

**3.3 PROTECTION**

- A. Protection finished work from rain during and for 48 hours following instructions.
- B. Protect finished work from damage during remainder of construction period.

**END OF SECTION 04700**

## **SECTION 04720 – ARCHITECTURAL CAST STONE**

### **Part 1 General**

#### **1.1. Section Includes**

- Scope - Cast Stone shown on architectural drawings and as described in this specification.
  - Manufacturer: Builder's Cast Stone
    - Trim details
    - Cast stone caps for planters
  - Type of Install:
    - Dry stack on exterior
    - Grouted on planters
    - Grouted on interior walls

#### **1.3. References**

- ASTM C 1364 - Standard Specification for Architectural Cast Stone.

#### **1.4. Definitions**

- Cast Stone - a refined architectural concrete building unit manufactured to simulate natural cut stone, used in Division 4 masonry applications.
  - Dry Cast – manufactured from zero slump concrete.
    - Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero-slump concrete against a rigid mold until it is densely compacted.
    - Machine casting method: Manufactured from earth moist, zero-slump concrete compacted by machinery using vibration and pressure against a mold until it becomes densely consolidated.

Wet Cast – manufactured from measurable slump concrete.

- Wet casting method: manufactured from measurable slump concrete and vibrated into a mold until it becomes densely consolidated.

Specifier Note: Selection of manufacturing method (wet cast, dry cast, machine made) and apparatus shall be made by the manufacturer and not by the purchaser.

#### **1.5. Submittal Procedures**

- Comply with Section 01 33 00 – Submittal Procedures.

- Samples: Submit pieces of the Cast Stone that are representative of the general range of finish and color proposed to be furnished for the project.
- Shop Drawings: Submit manufacturers shop drawings including profiles, cross-sections, reinforcement, exposed faces, arrangement of joints (optional for standard or semi-custom installations), anchoring methods, anchors (if required), annotation of stone types and their location.

## **Part 2 Products**

### **2.1. Architectural Cast Stone**

- Comply with ASTM C 1364
- Physical properties: Provide the following:
  - Compressive Strength - ASTM C 1194: 6,500 psi minimum for products at 28 days.
  - Absorption - ASTM C 1195: 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days.
  - Air Content – ASTM C 173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products.
  - Freeze-thaw – ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.
  - Linear Shrinkage – ASTM C 426: Shrinkage shall not exceed 0.065%.

### **2.2. Raw Materials**

- Portland cement – Type I or Type III, white and/or grey, ASTM C 150.
- Coarse aggregates - Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the VDT casting method.
- Fine aggregates - Manufactured or natural sands, ASTM C 33, except for gradation.
- Colors - Inorganic iron oxide pigments, ASTM C 979 except that carbon black pigments shall not be used.
- Admixtures- Comply with the following:
  - ASTM C 260 for air-entraining admixtures.  
ASTM C 494/C 495M Types A - G for water reducing, retarding, accelerating and high range admixtures.
  - Other admixtures: Integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.

- ASTM C 618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.
  - ASTM C 989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these features.
- Water – Potable
- Reinforcing bars:
  - ASTM A 615/A 615M: Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 in.
  - Welded Wire Fabric: ASTM A 185 where applicable for wet cast units.
- Fiber reinforcement (optional): ASTM C 1116
- All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

### **2.3. Color And Finish**

- Color: Builder's Cast Stone, Taupe coordinate with Sheet A201 and A202 – sample to be approved.
- Substitutions: See Specifications, Division 01600 – Product Requirements, Section 2.2 Product Substitutions – sample to be approved
- All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. and the density of such voids shall be less than 3 occurrences per any 1 in.□ and not obvious under direct daylight illumination at a 5 ft distance.
- Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 ft distance.
  - ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.
    - Total color difference – not greater than 6 units.
    - Total hue difference – not greater than 2 units.
- Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20-ft distance.
- The occurrence of crazing or efflorescence shall not constitute a cause for rejection.

- Remove cement film, if required, from exposed surfaces prior to packaging for shipment.

## **2.6. Manufacturing Tolerances**

- Cross section dimensions shall not deviate by more than  $\pm 1/8$  in. from approved dimensions.
- Length of units shall not deviate by more than length/ 360 or  $\pm 1/8$  in., whichever is greater, not to exceed  $\pm 1/4$  in.
  - Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.
- Warp, bow or twist of units shall not exceed length/ 360 or  $\pm 1/8$  in., whichever is greater.
- Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8 in., on unformed sides of unit, 3/8 in. maximum deviation.

## **2.8. Delivery, Storage and Handling**

- Mark production units with the identification marks as shown on the shop drawings.
- Package units and protect them from staining or damage during shipping and storage.
- Provide an itemized list of product to support the bill of lading.

## **3. Delivery, Storage and Handling**

### **3.1. Examination**

- Installing contractor shall check Cast Stone materials for fit and finish prior to installation. Unacceptable units shall not be set.

### **3.2. Setting Tolerances**

- Comply with Cast Stone Institute® Technical Manual.
- Set stones 1/8 in. or less, within the plane of adjacent units.
- Joints, plus - 1/16 in., minus - 1/8 in.

### **3.3. Jointing**

- Joint size:
  - At stone/brick joints 3/8 in.
  - At stone/stone joints in vertical position 1/4 in. (3/8 in. optional).
  - Stone/stone joints exposed on top 3/8 in.

- Joint materials:
  - Mortar, Type N, ASTM C 270.
  - Use a full bed of mortar at all bed joints.
  - Flush vertical joints full with mortar.
  - Leave all joints with exposed tops or under relieving angles open for sealant.
  - Leave head joints in copings and projecting components open for sealant.
- Location of joints:
  - As shown on shop drawings.
  - At control and expansion joints unless otherwise shown.

### **3.4. Setting**

- Drench units with clean water prior to setting.
- Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- Set units in full bed of mortar, unless otherwise detailed.
- Rake mortar joints 3/4 in. in for pointing.
- Remove excess mortar from unit faces immediately after setting.
- Tuck point unit joints to a slight concave profile.

### **3.5. Joint Protection**

- Comply with requirements of Section 07 90 00.
- Prime ends of units, insert properly sized backing rod and install required sealant.

### **3.6. Repair and Cleaning**

- Repair chips with touchup materials furnished by manufacturer.
- Saturate units to be cleaned prior to applying an approved masonry cleaner.
- Consult with manufacturer for appropriate cleaners

**END OF SECTION 04720**



**SECTION 04810 - UNIT MASONRY ASSEMBLIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Face Brick (Modular Brick)
  - 2. Concrete Masonry Units. (CMU)
  - 3. Joint Reinforcement, Ties and Anchors
  - 4. Split Face block
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 4 - Section 04720 Architectural Cast Stone.
  - 2. Division 7 - Section 07620 Sheet Metal Flashing for exposed sheet-metal flashing installed in masonry.
  - 3. Division 7 - Section 07920 Joint Sealants.
  - 4. Division 9 - Section 09260 Gypsum Board Assemblies for air-infiltration barrier.
- C. Products installed but not furnished under this Section include the following:
  - 1. Steel lintels for unit masonry specified in Division 5 - Section 05500 Metal Fabrications.
  - 2. Steel shelf angles for unit masonry specified in Division 5 - Section 05500 Metal Fabrications.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each different masonry unit, accessory, and other manufactured product specified.
- C. Shop drawings for precast concrete trim in the form of setting drawings showing sized, profiles, and locations of each unit required.
- D. Shop drawings for Calcium Silicate Masonry Trim Units in the form of setting drawings showing sized, profiles, and locations of each required.
- E. Samples for initial selection of the following:
  - 1. Unit masonry samples in small-scale form showing full range of colors and textures available for each different exposed masonry unit required.

2. Precast concrete trim samples not less than 12 inches (300-mm) in length showing the full range of colors and textures expected in the finished construction.
  3. Calcium Silicate Masonry Trim Units samples not less than 12 inches (300-mm) in length showing the full range of colors and textures expected in the finished construction.
- F. Shop drawings for reinforcement of CMU, drawn at 1/8" – 1'-0" min. scale showing control joints, all reinforcement, and bearing the review stamp of the contractor.
- G. Product data for each type of masonry unit and assembly specified.

#### **1.4 MOCK-UP OF WALL**

- A. Provide (3) three separate wall mock-ups, each showing brick, Stucco, and precast trim units. All wall mock-ups to include control joint construction through both brick and EIFS materials. Contact Architect for location of the mock-up and final color selections of materials.

#### **1.5 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- B. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items to prevent corrosion and accumulation of dirt and oil.

#### **1.7 PROJECT CONDITIONS**

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
1. Extend cover a minimum of 24-inches (600-mm) down both sides and hold cover securely in place.

- B. Stain Prevention: Prevent mortar, and soil from staining the face of masonry to be left exposed. Immediately remove mortar, and soil that come in contact with masonry.
  - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surfaces.
  - 2. Protect sills, ledges and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as, similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or material mixed or coated with ice or frost. Do not build on frozen sub-grade or setting beads. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements.
  - 1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
    - a. 40 to 32 deg F (4 to 0 deg C): Heat mixing water on sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C).
    - b. 32 to 25 deg F (0 to -4 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperature between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry.
    - c. 25 to 20 deg F

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements & manufacturers offerings. Products that may be incorporated in the Work include, but are not limited to the following:
  - 1. Brick:
    - a. Exterior Brick – coordinate with sheets A201 and A202
      - 1) Field Color – Basis of Design: Modular standard face brick – Yankee Hill  
Brick Color: Medium Iron spot, smooth,  
Mortar: Amerimix Light Maroon
    - b. Accent Color – coordinate with sheets A201 and A202
      - 1) Basis of Design: Modular standard face brick  
Accent Color: Cloud Ceramics, Ebony Iron Spot, smooth  
Mortar: Amerimix Dark Black
  - 2. Concrete Masonry Units
  - 3. Joint Reinforcement, Ties and Anchors:
    - a. Dur-O-Wal, Inc.
    - b. Heckman Building Products, Inc.
    - c. Hohmann & Barnard, Inc.
    - d. Masonry Reinforcing Corporation of America.
    - e. National Wire Products Industries.
    - f. Southern Construction Products.

## **2.2 BRICK**

- A. General: Provide shapes indicated and as follows for each form of brick required.
  - 1. Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces.
- B. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
  - 1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
  - 2. Provide special shapes for application where shapes produced by sawing would result in sawed surfaces being exposed to view.
- C. Face Brick: ASTM C 216 and as follows:
  - 1. Grade and unit Compressive Strength: Provide units with grade and minimum average net-area compressive strength indicated below:
    - a. Grade: SW
    - b. 3000 psi (20.7 MPa)
  - 2. Initial Rate of Absorption: Between 5 and 20 g/30 sq. in. (g/194 sq. cm) per minute when tested per ASTM C 67.
  - 3. Type: FBS.
  - 4. Size: Bricks manufactured to the following actual dimensions within tolerances specified in ASTM C 216:
    - a. Modular: 3-1/2 to 3-5/8 -inches (89 to 92-mm) thick by 2-1/4 inches (57-mm) high by 7-1/2 to 7-5/8 –inches (190 to 194-mm) long.
  - 5. Brick to match:
    - a. Manufacturer: See sheet A201
    - b. Color: See sheet A201 for two color selections
    - c. Texture: See Sheet A201 (smooth)

## **2.3 CONCRETE MASONRY UNITS**

- A. Concrete Masonry Units: ASTM C 90.
  - 1. Weight Classification: Light weight.
  - 2. Type: II, non-moisture-controlled units.
  - 3. Size (Width): Manufactured to the following dimensions:
    - a. 8-inches (203-mm) nominal; 7-5/8 – inches (194-mm) actual.
  - 4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
  - 5. Compressive strength – 3000 psi (f'm) @ 28 days.
- B. Split Face Concrete Masonry Units:
  - 1. Non-structural units: conform to ASCTM C129
  - 2. Provide split face texture on ALL exposed sides.
  - 3. Size (Width): Manufactured to the following dimensions:
    - a. 8-inches (203-mm) nominal; 7-5/8 – inches (194-mm) actual.
  - 4. Exposed Faces: Manufacturer's standard color and texture, see architectural for color.

## **2.4 MORTAR AND GROUT MATERIALS**

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Masonry Cement: ASTM C 91.
- C. Mortar Cement: U.B.C. Standard No. 21-14.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Portland Cement-Lime Mix: package blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
  - 1. For pigmented mortars, use colored portland cement-lime mix of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigment shall not exceed 10 percent of portland cement by weight for mineral oxides not 2 percent for carbon black.
- F. Aggregate for Mortar: ASTM C 144; except for joints less than ¼-inch (6.5-mm), use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- G. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
- H. Cold-Weather Admixture: Non-chloride, non-corrosive accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.
- I. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMU, containing integral water repellent by same manufacturer.
- J. Water: Potable.
- K. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Cold-Weather Admixture:
    - a. Accelguard 80; Euclid Chemical Co.
    - b. Morset; Grace: W.R. Grace & Co.
  - 2. Water-repellent Admixture:
    - a. Dry-Block Mortar Admixture; Grace: W.R. Grace & Co.

## **2.5 JOINT REINFORCEMENT**

- A. General: Provide joint reinforcement formed from the following:
  - 1. Galvanized carbon-steel wire, coating class as follows:
    - a. ASTM A 153, Class B-2.

- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3-m), with prefabricated corner and tee units, and complying with requirements indicated below:
  - 1. Wire Diameter for Side Rods: 0.1483-inch (3.8-mm).
  - 2. Wire Diameter for Cross Rods: 0.1483-inch (3.8-mm).
- C. For single-wythe masonry, provide type as follows with single pair of side rods:
  - 1. Ladder design with perpendicular cross rods spaced not more than 16-inches (407-mm) o.c.

## **2.6 TIES AND ANCHORS, GENERAL**

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.
- B. Wire: As follows:
  - 1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

## **2.7 ADJUSTABLE MASONRY-VENEER ANCHORS**

- A. General: Provide 2-piece assemblies allowing vertical or horizontal differential movement between wall and wall framing parallel to plane to wall but resisting tension and compression forces perpendicular to it, for attachment over sheathing to metal studs, and with the following structural performance characteristics:
  - 1. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in either tension or compression without deforming over, or developing play in excess of, 0.05-inch (1.3-mm).
- B. Screw-Attached, Masonry-veneer Anchors: Units consisting of a wire tie section and a metal anchor section complying with the following requirements:
  - 1. Wire Tie Shape: Triangular.
  - 2. Wire Tie Length: As required to extend 1-1/2 – inches (38-mm) into masonry wythe of veneer face.
  - 3. Anchor Section: Rib-stiffened, sheet-metal plate with screw holes top and bottom, 0.0747-inch (1.9-mm) thick by 2-3/4 – inches (70-mm) wide by 3-inches (75-mm) high; fabricated into tee shape with 2 projecting tabs, 3/4-inch (19-mm) wide by 1-inch (25-mm) long; with slotted holes for connection of vertical legs of triangular wire tie specially formed to fit anchor section.

## **2.8 EMBEDDED FLASHING MATERIALS**

- A. Sheet-Metal Flashing: Fabricate from the following metal complying with requirements specified in Division 7 Section “Flashing and Sheet Metal” and below:
  - 1. Stainless Steel: 0.0156-inch (0.4-mm) thick.
  - 2. Fabricate through-wall metal flashing embedded in masonry as follows:
    - a. With ribs formed in saw-tooth pattern at 3-inch (75-mm) intervals along length of flashing to provide a 3-way integral mortar bond and weep-hole drainage.

- B. Contractor's Option for Concealed Flashing: For flashing partly exposed to the exterior, use metal flashing specified above. For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:
  - 1. Rubberized-Asphalt Flashing: Manufacturer's standard composite flashing product consisting of a pliable and highly adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of 0.040-inch (1.0-mm).
  - 2. EPDM Flashing: Manufacturer's standard flashing product formed from a terpolymer of ethylene-propylene diene, complying with ASTM D 4637, 0.040-inch (1.0-mm) thick.
- C. Solder and Sealants for Sheet Metal Flashing: As specified in Division 7 section "Sheet Metal Flashing and Trim."
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by the flashing manufacturer for bonding flashing sheet to each other and to substrates.
- E. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Metal Flashing:
    - a. Cheney Flashing (Saw-tooth); Cheney Flashing Company, Inc.
    - b. Keystone 3-Way Interlocking Thruwall Flashing; Keystone Flashing Co.
  - 2. Rubberized-Asphalt Flashing:
    - a. Dur-O-Barrier: Dur-O-Wall, Inc.
    - b. Perm-A-Barrier Wall Flashing; W.R. Grace & Co., Construction Products Division.
  - 3. EPDM Flashing:
    - a. FlashGuard; Firestone Building Products.

## **2.9 MISCELLANEOUS MASONRY ACCESSORIES**

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:
  - 1. Neoprene.
  - 2. Urethane.
  - 3. Polyvinyl Chloride.
- B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Weep Tubes: Provide the following:
  - 1. Round Plastic Tubing: Medium-density polyethylene, 3/8-inch outside diameter by 4-inches long.
- D. Cavity Drainage Material: 3-inch-thick, reticulated, non-absorbent mesh, made from polyethylene strands and shaped to maintain drainage at weep holes without being clogged by mortar droppings.

1. Product: Subject to compliance with requirements, provide product equal to "Mortar Net" by Mortar Net USA, Ltd. 800-664-6638.

## **2.10 MASONRY CLEANER**

- A. Job-Mixed Detergent Solution: Solution of ½-cup (0.14-L) dry measure tetrasodium polyphosphate and ½-cup (0.14-L) dry measure laundry detergent dissolved in 1 gal. (4 L) of water.
- B. ProSoCo: Burnished Custom Masonry Cleaner.

## **2.11 MORTAR AND GROUT MIXES**

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerator, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
  1. Do not use calcium chloride in mortar or grout.
  2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions in order to ensure that mortar color is consistent.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for job-mixed mortar; and ASTM C 1142 for ready-mixed mortar, of types indicated below:
  1. Limit cementitious materials in mortar to portland cement and lime.
  2. For masonry below grade, in contact with earth, and where indicated, use type indicated below:
    - a. Type: S.
  3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; and for other applications where another type is not indicated, use type indicated below:
    - a. Type: N.

## **2.12 REINFORCING**

- A. Un-coated Steel Reinforcing Bars: ASTM A 617/A 617M, **Grade 60**.
- B. Masonry Joint Reinforcement: ASTM A 951; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine conditions for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.



- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

### **3.2 INSTALLATION, GENERAL**

- A. Thickness: Build veneer walls to the actual thickness of the masonry units, using units of thickness indicated.
- B. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.
- D. Wetting of Brick: Wet brick prior to laying if the initial rate of absorption exceeds 30 g/30 sq. in. (g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb the water so they are damp but not wet at the time of laying.

### **3.3 CONSTRUCTION TOLERANCES**

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arrises, do not exceed ¼-inch in 10-feet (6-mm in 3-m), nor 3/8-inch in 20-feet (12-mm in 12-m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed ¼-inch in 20-feet (6-mm in 6-m), nor ½-inch in 40-feet (12-mm in 12-m) or more. For vertical alignment of head joints, do not exceed plus or minus ¼-inch in 10-feet (6-mm in 3-m), nor ½-inch (12-mm) maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed ¼-inch in 20-feet (6-mm in 6-m), nor ½-inch in 40-feet (12-mm in 12-m) or more. For top surface of bearing walls, do not exceed 1/8-inch (3-mm) in 10-feet (3-m), nor 1/16-inch (1.5-mm) within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partition, do not exceed ½-inch in 20-feet (12-mm in 6-m), nor ¾-inch in 40-feet (19-mm in 12-m) or more.
- D. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8-inch (3-mm), with a maximum thickness limited to ½-inch (12-mm). Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8-inch (3-mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8-inch (3-mm). Do not vary head-joint thickness from adjacent head-joint thickness by more than 1/8-inch (3-mm). Do not vary from collar-joint thickness indicated by more than minus ¼-inch (6-mm) or plus 3/8-inch (10-mm).

### **3.4 LAYING MASONRY WALLS**

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thickness and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: In each course, rack back ½-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.

### **3.5 MORTAR BEDDING AND JOINTING**

- A. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
  - 1. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity.
- B. Set precast concrete units in full bed of mortar raking joints back and caulking. Set vertical joints slushed full. Fill dowel, anchor, and similar holes solid. Wet stone-joint surface thoroughly before setting; for stone surfaces that are soiled, clean bedding and exposed surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

### **3.6 CAVITIES**

- A. Keep cavities clean of mortar droppings and other materials during construction.

### **3.7 HORIZONTAL-JOINT REINFORCEMENT**

- A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8-inch (16-mm) on exterior side of walls, ½-inch (13-mm) elsewhere. Lap reinforcing a minimum of 6-inches (150-mm).
  - 1. Space reinforcement not more than 16-inches (406-mm) o.c.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by using prefabricated “L” and “T” sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### **3.8 ANCHORING MASONRY VENEERS**

- A. Anchor masonry veneers to metal studs with masonry-veneer anchors to comply with the following requirements:
  - 1. Fasten anchors through sheathing to metal studs with metal fasteners of type indicated.
  - 2. Embed tie section in masonry joints. Provide not less than 2-inch (50-mm) air space between back of masonry veneer and face of sheathing, unless noted otherwise.
  - 3. Locate anchor section relative to course where tie section is embedded to allow maximum vertical differential movement of tie up and down.
  - 4. Space anchors as indicated, but not more than 16-inches (406-mm) o.c. vertically and 18-inches (457-mm) o.c. horizontally. Install additional anchors within 12-inches (305-mm) of openings and at intervals around perimeter not exceeding 8-inches (203-mm).

### **3.9 CONTROL AND EXPANSION JOINTS**

- A. General: Install control and expansion joints in unit masonry where indicated on drawings. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement. **Do not install control/expansion joints at the jambs of doors/windows unless shown otherwise on architectural drawings.**
- B. Form expansion joints (indicated as control joints or expansion joints on drawings) in brick as follows:
  - 1. Build-in joint fillers where indicated.
  - 2. Form open joint of width indicated, but not less than ½-inch for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants." Maintain joint free and clear of mortar.
- C. All such joints shall be shown on shop drawings.

### **3.10 LINTELS**

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8-inches (200-mm) at each jamb, unless otherwise indicated.
- C. See lintel schedule in drawings.

### **3.11 FLASHING, WEEP HOLES, AND VENTS**

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive, sealant, before covering with mortar.
- C. Install flashing as follows:

1. At masonry-veneer walls, extend flashing from exterior face of veneer, through the veneer, up face of sheathing at least 8-inches (200-mm), and behind air-infiltration barrier.
  2. At lintels and shelf angles, extend flashing a minimum of 4-inches (100-mm) into masonry at each end. At heads and sills, extend flashing 4-inches (100-mm) at ends and turn up not less than 2-inches (50-mm) to form a pan.
  3. Interlock end joints of ribbed sheet-metal flashing by overlapping ribs not less than 1-1/2-inches (38-mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements of Division 7 Section "Joint Sealants" for application indicated.
  4. Extend sheet-metal flashing 1/2-inch (13-mm) beyond face of masonry at exterior and turn down to form a drip.
  5. Cut off flashing flush with face of wall after masonry wall construction is completed.
- D. Install weep vents (BY MORTAR NET) in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:
1. Form weep tubes with product specified by manufacturer
  2. Space weep vents at as recommended by manufacturer
  3. Place cavity drainage material (BYMORTAR NET) immediately above all flashing in cavities. Stretch the material lengthwise to fit the 2-inch cavity.

### **3.12 REINFORCED UNIT MASONRY INSTALLATION**

- A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
1. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602, including:
1. Securing masonry reinforcement in the cell before grouting.
  2. Between pours a 1-1/2" joint shall be formed by stopping grout short.
  3. Maximum height of grout pour shall not exceed 4'-8"
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

### **3.13 FIELD QUALITY CONTROL**

- A. The General Contractor will employ and pay a qualified independent testing agency perform the following testing for field quality control. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense. Refer to the testing laboratory services specification 01401.

- B. Testing Frequency: Tests and Evaluations listed in this Article shall be performed according to the building code. Refer to the testing laboratory services specification 01410 for more information.
- C. Mortar properties will be tested per property specification of ASTM C 270.
- D. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

### **3.14 REPAIRING, POINTING, AND CLEANING**

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and non-metallic

**END OF SECTION 04810**

## **SECTION 05500 - METAL FABRICATIONS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Miscellaneous steel framing and supports.
  - 2. Shelf angles.
  - 3. Loose bearing and leveling plates.
  - 4. Steel weld plates and angles.
  - 5. Miscellaneous steel trim.
  - 6. Metal ladders.
  - 7. Loose steel lintels.
  - 8. Trash Enclosure Gates and Post
  - 9. Support Plate for fire place
- B. See Structural Sheet S1 for more detailed specifications.

#### **1.2 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Prefabricated building columns.
- B. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  - 2. Products: Subject to compliance with requirements, provide one of the products specified.
  - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
  - 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

## **2.2 METALS**

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.
- B. Ferrous Metals:
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - 2. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
  - 3. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

## **2.3 FASTENERS**

- A. General: Type [304] [316] stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
- B. Cast-in-Place Anchors in Concrete: Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

## **2.4 MISCELLANEOUS MATERIALS**

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.
- B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat. Coordinate subparagraph and list below with Part 2 "Manufacturers" Article. Retain "Available" for nonproprietary and delete for semiproprietary specifications.
  - 1. Products:
    - a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
    - b. Carboline Company; Carbozinc 621.
    - c. ICI Devco Coatings; Catha-Coat 313.
    - d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
    - e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
    - f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
    - g. Tnemec Company, Inc.; Tneme-Zinc 90-97.
- C. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalvanizing welds in steel.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- E. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

## **2.5 FABRICATION**

- A. General: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
  2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.
  3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
  4. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
  5. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than **24 inches (600 mm)** o.c.
- B. Miscellaneous Framing and Supports: Provide steel framing and supports not specified in other Sections as needed to complete the Work. Fabricate units from steel shapes, plates, and bars of welded construction. Cut, drill, and tap units to receive hardware, hangers, and similar items.
1. Fabricate steel pipe columns for supporting wood frame construction with steel baseplates and top plates welded to pipe with fillet welds the same size as pipe wall thickness.
- C. Loose Steel Lintels: Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
1. Lintels in Exterior Walls: **Prime with zinc-rich primer**
- D. Shelf Angles: Fabricate shelf angles of sizes indicated and for attachment to framing. Fabricate with horizontally slotted holes to receive **3/4-inch (19-mm)** bolts, spaced not more than **6 inches (150 mm)** from ends and **24 inches (600 mm)** o.c.
1. Shelf Angles in Exterior Walls: **Prime with zinc-rich primer**
  2. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.
- E. Loose Bearing and Leveling Plates: Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts.
- F. Miscellaneous Steel Trim: Fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
1. Exterior Miscellaneous Steel Trim: **Prime with zinc-rich primer**
- G. Metal Ladders: Comply with ANSI A14.3, unless otherwise indicated.



1. Steel Ladder Construction: Flat bar siderails, with **3/4-inch- (19-mm-)** diameter steel bar rungs fitted in centerline of siderails, plug-welded, and ground smooth on outer rail faces.  
**Provide nonslip surfaces on top of each rung.**
- H. Trash Enclosure Gates and Post: Fabricate from **Schedule 40 steel pipe**
  1. Cap Post with **1/4-inch- (6-mm-)** thick steel plate.
  2. Gates and posts to be **POWDER COATED** to match Sherwin Williams Tricorn Black.

## **2.6 FINISHES**

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish metal fabrications after assembly.
- B. Steel and Iron Finishes:
  1. Hot-dip galvanize items as indicated to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.
  2. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below for environmental exposure conditions of installed metal fabrications:
    - a. Exteriors (SSPC Zone 1B) SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
    - b. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
  3. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.
- C. Trash Enclosure Gate and Post:
  1. **Powder Coat** to match Sherwin Williams Tricorn Black.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.
  1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.
  2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts and pack solidly with nonshrink, nonmetallic grout.
- C. Touch up surfaces and finishes after erection.
  1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.
  2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

**END OF SECTION 05500**

**SECTION 06100 - ROUGH CARPENTRY**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Wood framing
  - 2. Rooftop equipment bases and support curbs
  - 3. Wood grounds, nailers and blocking
  - 4. Wood furring
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 6 Section 'Interior Architectural Woodwork' for interior woodwork specially fabricated for this Project.

**1.3 DEFINITIONS**

- A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.
- B. Exposed Framing: Dimensional lumber not concealed by other construction and indicated to receive a stained or natural finish.

**1.4 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Section.
- B. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
  - 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
  - 2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
- C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.

- D. Warranty of chemical treatment manufacturer for each type of treatment.

## **1.5 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Keep the materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide air circulation within and around stacks and under temporary coverings.
  - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

## **PART 2 - PRODUCTS**

### **2.1 WOOD PRODUCTS, GENERAL**

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
  - 1. NELMA- Northeastern Lumber Manufacturers Association.
  - 2. NLGA-National Lumber Grades Authority (Canadian).
  - 3. SPIB-Southern Pine Inspection Bureau.
  - 4. WCLIB-West Coast Lumber Inspection Bureau.
  - 5. WWPA-Western Wood Products Association.
- C. Grade Stamps: Provide with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 1. Provide dressed lumber, S4S, unless otherwise indicated.
  - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

### **2.2 FIRE-RETARDANT-TREATED MATERIALS**

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber

Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Research or Evaluation Reports: Provide fire-retardant-treated wood acceptable to authorities having jurisdiction and for which a current model code research or evaluation report exists that evidences compliance of fire-retardant-treated wood for application indicated.
- B. Interior Type A: For interior locations, use chemical formulation that produces treated lumber or plywood with the following properties under conditions present after installation:
  1. Bending strength, stiffness, and fastener-holding capacities are not reduced below value published by manufacturer of chemical formulation under elevated temperature and humidity conditions simulating installed conditions when tested by a qualified independent testing agency.
  2. No form of degradation occurs due to acid hydrolysis or other causes related to treatment.
  3. Contact with treated wood does not promote corrosion of metal fasteners.
- C. Exterior Type: Use for exterior locations and where indicated.
- D. Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.
- E. All interior rough carpentry shall be fire-retardant-treated unless otherwise indicated to be wood-preservative-treated. Exterior rough carpentry shall be fire-retardant-treated instead of wood-preservative-treated where required by authorities having jurisdiction.

## **2.3 MISCELLANEOUS LUMBER**

- A. General: Provide lumber for support or attachment of other construction, including bucks, nailers, blocking, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shape shown.
- C. Moisture Content: 19 percent maximum for lumber items are not specified to receive wood preservative treatment.
- D. Grade: For dimensional lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For NLGA, or WWP; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWP of any species.

## **2.4 FASTENERS**

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  1. Where miscellaneous carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.

- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6).

## **2.5 METAL FRAMING ANCHORS**

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated on drawings and as follows:
  - 1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.
  - 2. Allowable Design Loads: provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

## **2.6 MISCELLANEOUS MATERIALS**

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32-inch (0.8-mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by both adhesive and panel manufacturers.

# **PART 3 - EXECUTION**

## **3.1 INSTALLATION, GENERAL**

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- D. Apply field treatment complying with AWP M4 to cut surfaces of preservative-treated lumber and plywood.

- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. CABO NER-272 for power-driven fasteners.
  - 2. Published requirements of metal framing anchor manufacturer.
  - 3. "Recommended Nailing Schedule" of referenced framing standard and with AFPA's "National Design Specifications for Wood Construction."
- F. Use common wire nails, unless otherwise indicated. Use finishing nails for exposed finish work. Select fasteners of size that will not full penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dipped galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in areas of high relative humidity.
- H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

### **3.2 WOOD NAILERS AND BLOCKING**

- A. Install wood, nailers, and blocking where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

### **3.3 WOOD FRAMING, GENERAL**

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Install framing members of size and at spacing indicated.
- D. Do not splice structural members between supports.

### **3.4 WALL AND PARTITION FRAMING**

- A. General: arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor plates to supporting construction, unless otherwise indicated.
  - 1. Provide size and spacing as indicated on drawings.

- B. Construct corners and intersections with 3 or more studs. Provide miscellaneous blocking and framing as shown and as required to support facing materials, fixtures, specialty items, and trim.
- C. Frame opening with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.
  - 1. For non-load-bearing partition, provide double-jamb studs with headers not less than 4-inch nominal (89-mm actual) depth for openings 36-inches (900-mm) and less in width, and not less than 6-inch nominal (140-mm actual) depth for wider openings.
  - 2. For load-bearing walls, provide double-jamb studs for openings 72-inches (1800-mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth shown or, if not shown, as recommended by AFPA's 'Manual for Wood Frame Construction.'
- D. Provide bracing in exterior walls, at both walls of each external corner, full-story height, unless otherwise indicated.
- E. Provide bracing in walls, at locations, indicated, full-story height, unless otherwise indicated. Provide one of the following:
  - 1. Plywood panels, not less than 48 by 96-inches (1219 by 2438-mm) applied vertically.
  - 2. Performance-rated structural-use panels, not less than 48 by 96-inches (1219 by 2438-mm) applied vertically.
  - 3. Particleboard sheathing panels, not less than 48 by 96-inches (1219 by 2438-mm) applied vertically.

**END OF SECTION 06100**



## **SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary conditions and Division 1 specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes interior woodwork including for the following applications:
  - a. Standing and running trim.
  - b. Door jambs and trim
  - c. Plastic Laminate
  - d. Solid-surfacing-material countertops.
  - e. Natural Quartz Finish
  - f. Granite
  - g. Wood board wainscot and partial height walls
  - h. Custom ceiling solid wood linear grill
  - i. Custom ceiling open wood grid ceiling
- B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips, unless concealed within other construction before woodwork installation.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
  - a. See Division 6 Section "Rough Carpentry" for framing, burring, blocking and other carpentry work concealed in the wall.
  - b. See Division 8 Section "Stile and Rail Wood Doors" for doors specified by reference to architectural woodwork standards.

#### **1.3 SUBMITTALS**

- A. Product data for each type of product and process specified and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - a. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified in other Sections.
  - b. Show veneer leaves with dimensions, grain direction, exposed face, and an identification number indicated for each leaf. Identification number shall indicate the flitch and the sequence within the flitch for each leaf.

- C. Samples for initial selection of the following in the form of manufacturer's color charts consisting of actual units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated:
  - a. Lumber and panel products for transparent finish, for each species and cut, finished on one side and one edge.
- D. Product certificates signed by woodwork fabricator certifying that products comply with specified requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.
- B. Installer qualifications: Arrange for interior architectural woodwork installation by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.
- C. Quality Standard: Except as otherwise indicated, comply with the following standard:
  - a. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grades of interior architectural woodwork, construction, finishes, and other requirements.
    - a. Provide AWI Certification labels or Certificates of Compliance indicating that woodwork meets requirements of grades specified.
- D. Pre-installation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage and deterioration.
- B. Do not deliver woodwork until painting and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environment conditions meet requirements specified in "Project Conditions."

#### **1.6 PROJECT CONDITIONS**

- A. Environmental Limitations: Obtain and comply with woodwork fabricator's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - a. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.
  - b. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site and coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

## **1.7 COORDINATION**

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork with requirement of the referenced product standards that apply to product characteristics indicated:
  - a. Hardboard: AHA A135.4.
  - b. Particleboard: ANSI A208.1, Grade M-2.
  - c. Softwood Plywood: PS 1.
  - d. Hardwood Plywood and Face Veneers: HPVA HP-1.
- B. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as indicated, or if not indicated, as required by woodwork quality standard.
  - a. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
    - a. Formica Corporation.
    - b. Laminart.
    - c. Nevamar Corporation.
    - d. Wilsonart Corporation.
- C. Adhesive for Bonding Plastic Laminate: Urea-formaldehyde.
- D. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with the material and performance requirements of ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - a. DuPont Polymers; Corian.

- E. Natural Quartz Surface
  - a. See finish schedule
- F. Interior finish standing and running trim including wall boards, cap trim, door jambs
  - a. Grade: Custom
  - b. Wood Species and Cut: Red Oak, quarter sawn, book matched, vertical grain direction, - sanded to accept transparent stain (2 stain colors) eased edges as note in drawings. provide samples for approval
- G. Granite (exterior patio communal table)
  - a. 3 cm., Level 2 Polish Finish
  - b. Color: as noted on drawings
- H. Custom Solid Wood Linear Grill
  - a. Provided by Wood Trends Wood Grill Ceiling – Contact: Gordon Hutchinson, ghutchinson@soundseal.com
  - b. 2 x 6 Red Oak, Quarter Sawn, custom lengths
  - c. Finish and transparent stain (color TBD by architect) on all 4 sides and polyurethane (satin).
  - d. Shop finish to be completed in shop prior to delivery to field
  - e. Provide shop drawings and finished sample for approval

## **2.2 FABRICATION, GENERAL**

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
  - a. Interior Woodwork Grade: Premium complying with the referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- C. Transparent finish for interior trim. Custom stain to match professional sample - finish: Swedish finish acid cure urethane – satin finish range
- D. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated on drawings.
- E. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- F. Shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

**2.3 INTERIOR RUNNING TRIM FOR TRANSPARENT FINISH (include wood boards on wainscot and partial height walls)**

- A. Quality Standard: Comply with AWI Section 300.
  - a. Grade: Premium.
- B. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- C. Wood Species: **BEECH, Quarter Sawn, provide sample with stain and finish for approval prior to installation**
- D. Finish: transparent stain – to be determined by architect.
- E. Finish acid cure urethane, Swedish finish, semi-gloss. Manufacturer: Absco Swedish Finish for Pros

**2.4 COUNTERTOPS**

- A. Quality Standard:
  - a. Grade: Custom.
- B. Type of Top:
  - a. Natural Quartz Finish
  - b. Solid Surface Material
- C. Edge Treatment: as shown on drawings
- D. Core Materials: medex

**2.5 SOLID SURFACING MATERIAL COUNTERTOPS**

- A. Quality Standard: Comply with applicable WIC section indicated below:
  - a. WIC Section 17D, "Decorative Synthetic Marble Countertops and Sinks."
  - b. Grade: Premium.
- B. Fabrication: Fabricate tops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with solid surfacing material manufacturer's recommendations for adhesives, sealers, fabrication and finishing.
- C. Natural Quartz Material thickness: as shown on drawings.
  - a. Color, Patterns, and Finishes:
    - a. Manufacturer: Cambria; See Finish schedule
    - b. Color: See finish schedule Sheet A902

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

### **3.2 INSTALLATION**

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B. Install woodwork level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches for plumb and level (including tops).
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces and repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation, unless otherwise indicated, (at Wooden Tile locations). Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
  - a. Install standing and running trim with no more than 1/8-inch in 96-inch (3-mm in 2400-mm) variation from a straight line.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Caulk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
  - a. Install countertops with no more than 1/8-inch in 96-inch (3-mm in 2400-mm) sag, bow, or other variation from a straight line.
  - b. Secure backsplashes to tops with concealed metal bracket at 16-inches (400-mm) o.c.
- G. Complete the finishing work specified in this Section to the extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed. Apply specified finish coat, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in the shop.
- H. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

### **3.3 ADJUSTING AND CLEANING**

- A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

**3.4 PROTECTION**

- A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Completion.

**END OF SECTION 06402**

**SECTION 07130 - WATERPROOFING**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Self-adhered below grade sheet membrane waterproofing and accessory products to be located in planter at front of building

**1.2 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original unopened containers of packaging clearly labeled with manufacturer's name, brand name, instruction for use and all identifying numbers.
- B. Store all materials upright, on pallets, in protected and well-ventilated areas. Only materials to be used the same day shall be removed from this location. Special care shall be required at temperatures below 40 degree F (4 degree C). Keep all materials away from open flame or welding sparks.
- C. Pails of materials shall be carefully stored and adequately protected in accordance with the manufacturer's recommendations.

**1.3 SITE PROTECTION**

- A. During waterproofing work, exposed surfaces of finished surfaces shall be protected with tarps to prevent damage. Contractor shall assume full responsibility for any damage.
- B. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials and products used.
- C. The Contractor shall provide for adequate protection of the installed membrane preventing damage that might arise from work performed by the other trades.
- D. Apply drainage/ protection board/ insulation as soon as possible after membrane installation.
- E. Do not allow waste products, including but not limited to petroleum, grease, oil, solvents, vegetable or mineral oil, animal fat, to come in contact with the waterproofing membrane. Contaminated membrane shall be cut out and replaced in accordance with the Approved Details.

**1.4 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original unopened containers of packaging clearly labeled with manufacturer's name, brand name, instruction for use and all identifying numbers.
- B. Store all materials in protected and well-ventilated areas. Only materials to be used the same day shall be removed from this location. Special care shall be required at temperatures below 40 degree F (4.5 degree C). Keep all materials away from open flame or welding sparks.



- C. Pails of materials shall be carefully stored and adequately protected in accordance with the manufacturer's recommendations.
- D. Store all adhesives at temperatures between 60 degree F (15.5 degree C) and 80 degree F (26.6 degree C).

## **1.6 WARRANTY**

- A. Sheet Membrane Waterproofing: Upon completion of work, the contractor shall supply the Owner with a single-source warranty issued by the manufacturer of the waterproofing assembly.
- B. Warranty for Adhered membrane Waterproofing: The product manufacturer shall issue a written and signed document in the name of the Owner, certifying the product shall meet all the physical characteristics published by the manufacturer, for the stated period of years, starting from the date of completion of installation of membranes. No letter amending the manufacturer's standard warranty shall be accepted and the warranty certificate shall reflect these requirements.
  - 1. Warranty Period: 5 years.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable Manufacturer: SOPREMA, Inc., which is located at: 310 Quadral Dr. ; Wadsworth, OH 44281; Toll Free Tel: 800-356-3521; Tel: 330-334-0066; Email: [requestinfo \(bbotdorf@soprema.us\)](mailto:requestinfo@bbotdorf@soprema.us); Web: [www.soprema.us](http://www.soprema.us)
- B. Or Equal

### **2.2 SELF-ADHERED SHEET MEMBRANE BELOW GRADE WATERPROOFING**

- A. Furnish and install a complete vertical and/or horizontal waterproofing assembly including a self-adhered sheet waterproofing membrane with a drainage / protection course. To ensure total system compatibility all products shall be purchased from a single-source manufacturer.
- B. Sheet Membrane Waterproofing:
  - 1. Product: Colphene 3000 Summer Grade / Winter Grade manufactured by Soprema.
  - 2. A self-adhered, cold applied waterproofing membrane composed of SBS modified bitumen and a polyethylene woven complex top sheet. The membrane shall have a total thickness of 60 mils (1.5 mm). Provide rubberized asphalt membrane covered with a release sheet which is removed during installation. No special adhesive or heat shall be required to form laps.
  - 3. Thickness: 60 mils (1.5 mm).
  - 4. Tensile Strength, MD/XD (lbf/sq inch) ASTM D412: 1624 / 1900.
  - 5. Tensile Strength, Film (lbf/sq inch) ASTM D882: 19500.
  - 6. Elongation of Rubberized Asphalt ( percent) ASTM D412: > 1000.
  - 7. Flexibility at Cold Temperature (degree F) ASTM D1970: -31 degree F (-35 degree C).
  - 8. Puncture Resistance (lb) ASTM E154: 168 (76 kg).
  - 9. Lap Adhesion (lbf/in) ASTM D1876: 11.4 (2000 N/m).
  - 10. Water Absorption ( percent) ASTM D570: 0.1 maximum.
  - 11. Peel Resistance (lbf/in) ASTM D903: 20.
  - 12. Water Vapor Permeance (ng/Pa-s-m2) ASTM E96 (Procedure B): 0.49 (0.0086 perm).
  - 13. Crack Cycling at -32 degree C, 100 Cycles ASTM D1970: Unaffected.
  - 14. Resistance to Hydrostatic Head ASTM D751: 231 ft (70 m) minimum.

- C. Primer:
  - 1. Surface Primer: A solvent based primer used specifically for self-adhered membranes. Primer is composed of a blend of natural resins and solvent/synthetic rubber; shall be spray or roller applied.
    - a. Product: ELASTOCOL 600c by SOPREMA.
  - 2. Surface Primer: A polymer, emulsion based primer used specifically for self-adhered membranes. Primer shall be spray or roller applied. For use when temperatures are above 41 degree F (5 degree C). Keep from freezing.
    - a. Product: ELASTOCOL STICK H20 by SOPREMA.

### **2.3 ACCESSORIES**

- A. Waterproofing Liquid Membrane: Shall be a fluid applied, single-component, bitumen/polyurethane resin used for flashings and specific penetrations.
  - 1. Product: Alsan Flashing.
- B. Multipurpose, one part urethane sealant, edge sealant and caulking compound.
  - 1. Product: Sopramastic SM-1 by Soprema, Inc.
- C. Termination Bar: Extruded aluminum, 1 inch wide by .098 inch (25 mm by 2.5 mm) thick with sealant edge and fastener holes at maximum 12 inches (305 mm) centers.
  - 1. Product: As approved by Soprema, Inc.

## **PART 3 EXECUTION**

### **3.1 SURFACE INSPECTION**

- A. Do not begin installation until substrates have been properly prepared.
- B. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are completed.
- C. Concrete Inspection:
  - 1. All horizontal concrete surfaces shall be finished with a wood float or wood trowel. Very smooth surfaces (e.g., surfaces finished with a steel trowel) shall be scarified or chemically etched prior to installation of the waterproofing membrane to ensure proper bonding.
  - 2. All vertical concrete surfaces shall be free of voids, honeycombs and any sharp protrusions.
  - 3. Verify that concrete has cured and aged for minimum time period recommended by membrane manufacturer.
  - 4. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D-4263.
  - 5. Determinations of bond strength and moisture content are the responsibility of the contractor and shall be performed periodically by the contractor throughout the course of work.
  - 6. Do not install materials in conditions of inclement weather.
- D. Concrete Inspection:
  - 1. Strength/Density: Minimum 2,500 psi (17,235 kPa) Compressive Strength. Minimum 115 pcf (1842 kg/m3) Density.
  - 2. Form Release Agents: Petroleum based products. Distillates are not to be used.

### **3.2 SURFACE PREPARATION**

- A. Surfaces shall be structurally sound and free of voids, spalled areas, looser aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.
- B. Cast-In-Place Concrete Substrates:
  - 1. Do not proceed with installation until concrete has properly cured and dried (minimum 7 days for normal structural concrete and minimum 14 days for lightweight structural concrete). Horizontal slabs should be sloped for positive drainage.
  - 2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
  - 3. Repair void/holes over 0.5 inch (13 mm) in length and 0.25 inch (6 mm) deep and finish flush with surrounding surface.
  - 4. Remove scaling to sound, unaffected concrete and repair exposed area with approved materials and methods which are acceptable to manufacturer of sheet membrane waterproofing.
  - 5. Grind irregular construction joints to suitable flush surface.
- C. Masonry Substrates: Apply waterproofing over suitable concrete block and brick with smooth trowel-cut mortar joints or parge coat.
- D. Related Materials: Treat joints and install flashing as recommended by waterproofing membrane manufacturer.

### **3.3 ADHERED MEMBRANE WATERPROOFING INSTALLATION**

- A. Comply with membrane manufacturer's literature and approved details for installation, including but not limited to the following:
  - 1. Apply primer by spray or roller at a rate recommended by the membrane manufacturer. Recoat areas not waterproofed if contaminated by dust. Allow primer to dry per membrane manufacturer's recommendations.
  - 2. Joints shall have been properly grouted, sealed and have received the appropriate water stop as required. Materials shall be fully cured and functioning as the primary joint seal, prepared to receive the waterproofing membrane. These joints, control joints, and any crack over 1/16 inch (1.6 mm) wide shall be void free and stripped in with a 9 inches (229 mm) wide strip of Colphene 3000 membrane.
  - 3. Tee joints that occur during installation of the membrane shall be coated 6 inches (152 mm) in all directions with a bed of troweled Colphene Liquid Membrane, and as necessary to assure all lap edges in the tee-joint shall remain sealed. An additional layer of Colphene 3000 membrane shall be required to be embedded in the Colphene Liquid Membrane and extend past the joint 6 inches (152 mm) in all directions.
  - 4. After cleaning, removal of all loose materials and proper surface preparation, all cuts, tears, abrasions, poor seam adhesion, and slit blemishes, fishmouths, wrinkles, and all other imperfections shall be repaired with Colphene 3000 membrane extending 6 inches (152 mm) in all directions from the point of repair. The edges of this patch shall receive a trowel application of Colphene Liquid Membrane, Sopramastic SM-1, SBS Mastic, SBS Elastic Cement, or Alsan Flashing.
- B. Horizontal Installation:
  - 1. Shingle membrane, starting at the low point so the laps shall properly shed water. Side-laps shall be 3 inches (76 mm), end-laps shall be 6 inches (152 mm) and staggered a minimum 12 inches (304 mm) from adjacent seams. Roll in place using a weighted roller, as required. Ensure that all laps are firmly adhered and that there are no voids or fish mouths.
  - 2. All drains are to be seated flush with the deck, immobilized and grouted as required to

eliminate voids. At all drain locations, one reinforcing ply of Colphene 3000 membrane is to be centered over the drain, extending a minimum of 12 inches (305 mm) past the drain bowl in all directions, onto the substrate. Apply a continuous bead of Colphene Liquid Membrane at the perimeter edges of this ply. Cut out the drain opening to allow the reinforcing ply to extend past the clamping ring. Center a ply of field membrane creating a dual ply at drain locations, also cutting the field ply to extend past the clamping ring. Apply Colphene Liquid Membrane into the drain bowl sealing the edges of both plies of Colphene 3000, and extended back 4 inches (102 mm) onto the horizontal surface where the clamping ring shall seat. After cure of the Colphene Liquid Membrane, set and seat the clamping ring engaging both plies as the ring is secured.

3. All angle changes (vertical wall to horizontal deck substrate; and inside corners, wall to wall) shall receive a bead of Colphene Liquid Membrane applied to extend 3 inches (76 mm) onto the vertical wall and 3 inches (76 mm) onto the horizontal deck. Install a 12 inches (305 mm) width of Colphene 3000 as a reinforcement membrane centered 6 inches (152 mm) up the wall and 6 inches (152 mm) onto the deck (wall to wall is to be centered 6 inches (152 mm) onto one wall and 6 inches (152 mm) onto the opposing wall). Apply pressure to insure membrane is fully adhered and sealed tightly. Outside corners shall receive a 12 inches (152 mm) width of Colphene 3000 as reinforcement, wrapping the corner 6 inches (152 mm) in each direction (Colphene Liquid Membrane is not required). Corners shall be tightly seated and sealed from the finished side with Colphene Liquid Membrane as required. As the field membrane is installed, ensure all reinforcement membrane is covered, providing a full two ply finished assembly. All perimeter wall terminations are required, and shall meet local building code requirements and Soprema Approved Details.
4. Install the Colphene 3000 membrane in shingle fashion, starting at the low point so the laps shall properly shed water. Side-laps shall be 3 inches (76 mm) end-laps shall be 6 inches (152 mm) and staggered a minimum 12 inches (305 mm) from adjacent seams. Roll in place using a 75 lb (34 kg) minimum weighted roller. Ensure that all laps are firmly and smoothly adhered without voids, wrinkles, or fishmouths.
5. All penetrations are to be firmly anchored from the underside, immobilized and grouted flush to eliminate voids.
6. Install Colphene 3000 to within 1/2 inch (13 mm) of the penetration. Apply a continuous bead of Colphene Liquid Membrane at the base of the penetration extended onto the horizontal deck 3 inches (76 mm) and up the penetration to the height of the finish elevation.
7. Install Colphene 3000 to within 1/2 inch (13 mm) of the penetration and apply Alsan H-80 Primer if needed. Apply Alsan Flashing base coat extended onto the deck 4 inches (102 mm) and up the penetration to the height of the finish elevation, Embed 6 inches (152 mm) wide reinforcing strip of Alsan Fleece, extended 3 inches (76 mm) onto the deck and 3 inches (76 mm) vertically up the penetration. Apply Alsan Flashing top coat extended 4 inches (102 mm) onto the horizontal deck and vertically to the height of the finished elevation.

**C. Vertical Installation:**

1. Apply membrane as to promote positive drainage, starting at the lowest point with the higher membrane overlapping the lower membrane a minimum 6 inches (152 mm). Roll in place using firm pressure with a hand roller. Ensure that all laps are firmly adhered and that there are no voids or fish mouths.
2. Terminations: Membrane shall be terminated in accordance with Soprema Approved Details. Seal membrane terminations and T-joints with troweled bead of Sopramastic or other approved sealant.
3. Footer and all angle changes, (vertical wall to horizontal deck substrate; and inside corners, wall to wall) shall receive a bead of Colphene Liquid Membrane applied to extend 3 inches (76 mm) onto the vertical wall and 3 inches (76 mm) onto the horizontal deck. Install a 12 inches (305 mm) width of Colphene 3000 as a

reinforcement membrane centered 6 inches (152 mm) up the wall and 6 inches (152 mm) onto the footer/deck (wall to wall is to be centered 6 inches (152 mm) onto one wall and 6 inches (152 mm) onto the opposing wall). Apply pressure to insure membrane is fully adhered and sealed tightly. Outside corners shall receive a 12 inches (305 mm) width of Colphene 3000 as reinforcement, wrapping the corner 6 inches (152 mm) in each direction (Colphene Liquid Membrane is not required). Corners shall be tightly seated and sealed from the finished side with Colphene Liquid Membrane as required. As the field membrane is installed, ensure all reinforcement membrane is covered, providing a full two ply finished assembly. All perimeter wall terminations are required and shall meet local building code requirements and Soprema Approved Details.

4. Install Colphene 3000 membrane with 3 inches (76 mm) minimum side laps, 6 inches (152 mm) minimum end laps, in maximum 8 feet (2.5 m) lengths. Roll in place using firm pressure with a hand roller. Ensure that all laps are firmly and smoothly adhered and that there are no voids or fishmouths. Trowel a bead of Colphene Liquid Membrane, Sopramastic SM-1, SBS Mastic, or SBS Elastic Cement to all horizontal and all vertical terminations at the end of each day, and to laps that occur within 12 inches (305 mm) of a corner.
5. All penetrations are to be firmly anchored from the interior, immobilized and grouted flush to eliminate voids. Install Colphene 3000 to within 1/2 inch (13 mm) of the penetration. Apply a continuous bead of Colphene Liquid Membrane at the base of the penetration extended onto the vertical wall 3 inches (76 mm) and onto the penetration 12 inches (305 mm) minimum.
6. Install Colphene 3000 to within 1/2 inch (13 mm) of the penetration and apply Alsan H-80 Primer if needed. Apply Alsan Flashing base coat extended onto the wall 4 inches (102 mm) and a minimum of 12 inches (305 mm) onto the penetration. Embed 6 inches (152 mm) wide reinforcing strip of Alsan Fleece, extended 3 inches (76 mm) onto the wall and 3 inches (76 mm) out onto the penetration. Apply Alsan Flashing top coat extended 4 inches (102 mm) onto the wall and onto the penetration 12 inches (305 mm) minimum.
7. Terminations: Membrane shall be terminated in accordance with Soprema Approved Details. Colphene 3000 membrane shall be terminated at or above grade by firmly seating and sealing top edge of the sheet, and applying a bead of Sopramastic SM-1 at the top edge of the sheet. The extruded aluminum termination bar shall be fastened with appropriate, approved fasteners on not less than 12 inches (305 mm) centers. The termination bar shall provide constant, adequate, even pressure to hold the membrane in place. Add additional fasteners as conditions (and assembly) require. Sopramastic SM-1 shall be applied in the sealant ledge of the termination bar.

### **3.4 PROTECTION AND CLEANING**

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by membrane manufacturer of affected construction.

**END OF SECTION 07130**

## **SECTION 07190 - WATER REPELLENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

#### **1.2 SUMMARY**

- A. This Section includes clear water-repellent coatings for the following vertical and nontraffic horizontal surfaces:
  - 1. Brick masonry.
  - 2. Cast stone trim
  - 3. Concrete unit masonry (unpainted and unglazed).

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's specifications, installation instructions, and general recommendations for water repellents. Include data substantiating that materials are recommended by manufacturer for applications indicated and comply with requirements.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer (applicator) who employs only persons trained and approved by manufacturer to apply manufacturer's products.

#### **1.5 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace water-repellent coatings that fail in materials and workmanship within five years from date of Substantial Completion. Warranty does not include deterioration or failure of coating due to unusual weather phenomena, failure of prepared and treated substrate, new substrate cracks in excess of **1/16 inch (1.5 mm)** wide, fire, vandalism, or abuse by maintenance equipment.

### **PART 2 - PRODUCTS**

#### **2.1 WATER –BASED ACRYLIC SEALER**

- A. Provide manufacturer's standard "water-clear" emulsion-type breathing coating of acrylic resins (based on methyl methacrylate) in water recommended by manufacturer for application to

exterior masonry surfaces as a water-repellent coating; averaging 15-percent to 22-percent solids content.

- B. Available manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include , but are not limited to, the following:
  - a. ProSoCo, Inc.

## **2.2 GRAFFITI CONTROL AND WATER REPELLANT**

- A. Graffiti Control and Water Repellant for horizontal conditions, clear-drying, water based silicone emulsion for weatherproofing porous masonry materials and protecting them from graffiti attack.
- B. Location of installation - at horizontal conditions at the following:
  - a. Cast Stone on planter at front of building
  - b. Cast Stone Trim

## **EXECUTION**

### **2.3 APPLICATION**

- A. Preparation: Clean substrate of substances that might interfere with penetration or performance of water repellents. Test for moisture content, according to water repellent manufacturer's written instructions, to ensure surface is sufficiently dry.
  - 1. Formed Concrete: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of water repellents.
  - 2. Clay Brick Masonry: Clean per ASTM D 5703.
- B. Weather and Substrate Conditions: Do not proceed with application of water repellent under any of the following conditions, except with written instruction of manufacturer:
  - 1. Ambient temperature is less than 40 deg F (4.4 deg C).
  - 2. Concrete surfaces and mortar have cured for less than 28 days.
  - 3. Rain or temperatures below 40 deg F (4.4 deg C) are predicted within 24 hours.
  - 4. Application is earlier than 24 hours after surfaces have been wet.
  - 5. Substrate is frozen or surface temperature is less than 40 deg F (4.4 deg C).
  - 6. Windy condition exists that may cause water repellent to be blown onto vegetation or surfaces not intended to be coated.
- C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is possibility of water repellent being deposited on surfaces. Cover live plants and grass.
- D. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those used in the Work.
- E. Test Application: Before performing water-repellent work, including bulk purchase and delivery of products, prepare small application in an unobtrusive location and in a manner approved by Architect to demonstrate final effect (visual, physical, and chemical) of planned application. Proceed with work only after Architect approves test application or as otherwise directed.
1. Revisions of planned application, if any, as requested by Architect, will be by Change Order if they constitute departure from requirements of the Contract Documents at time of contracting.
- F. Apply heavy-saturation spray coating of water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with manufacturer's written instructions for using airless spraying procedure, unless otherwise indicated.
- G. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturer's written cleaning instructions.
- H. After application is complete, remove protective coverings from adjacent surfaces and other protected areas.

## **2.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Provide services of a factory-authorized technical service representative to inspect and approve substrate before application and to instruct applicator on product and application method to be used.

**END OF SECTION 07190**



## **SECTION 07210 - BUILDING INSULATION**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Insulation under slabs-on-grade.
  - 2. Foundation wall insulation (supporting backfill).
  - 3. Cavity wall insulation
  - 4. Unfaced batt insulation (locate in back of house above ceiling where exposed)

#### **1.2 QUALITY ASSURANCE**

- A. Single-source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.
- B. Fire-Test Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspection agency.
  - 1. Surface-Burning Characteristics: ASTM E 84.
  - 2. Fire-resistance Ratings: ASTM E 119.
  - 3. Combustion Characteristics: ASTM E 136.

#### **1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERES**

- A. Manufacturers: Subject to compliance with requirements, provide insulation products by one of the following:
  - 1. Polyisocyanurate Board Insulation:
    - a. Amoco Foam Products Company.
    - b. DiversiFoam Products.
    - c. Dow Chemical Co.
    - d. UC Industries, Inc.; Owens-Corning Co.

- e. Equal to above
- 2. Glass-Fiber Insulation:
  - a. CertainTeed Corporation.
  - b. Georgia-Pacific
  - c. Owen-Corning Fiberglas Corporation.
  - d. Schuller International, Inc.
  - e. Equal to above

## **2.2 INSULATING MATERIALS**

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
  - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thickness, widths and lengths.
- B. Poly Board Insulation: 2 inch Rigid, cellular polystyrene thermal insulation formed from polystyrene base resin by an extrusion process using hydrochlorofluorocarbons as blowing agent to comply with ASTM C 578 for type and with other requirements indicated below:
  - 1. Type IV, 1.60 lb/cu. ft. (26 kg/cu. m) minimum density, unless otherwise indicated.
  - 2. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indices of 75 and 450, respectively.
  - 3. Recycled Content: Not less than 50 percent blend of post-consumer and recovered polystyrene resins.
  - 4. Used as foundation perimeter insulation. **R-10**
- C. Mineral-fiber Blanket insulation consisting of fibers manufactured from glass.
  - 1. Faced mineral-fiber blanket insulation: ASTM C665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E136. (Used in walls) **R-20**
  - 2. Faced Mineral-Fiber Blanket Insulation: ASTM C 665, Type III, Class A; Category 1, faced with foil-scrim-kraft, foil-scrim, or foil-scrim-polyethylene vapor-retarder membrane on one face. (Used in above ceiling under roof) **R-38**
- D. Under slab insulation at coolers
  - 1. XSP Polystyrene

## **2.3 AUXILIARY INSULATING MATERIALS**

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Protection Board: Premolded, semirigid asphalt/fiber composition board, 1/4 inch (6 mm) thick, formed under heat and pressure, of standard sizes.

## **2.4 INSULATION FASTENERS**

- A. Adhesively Attached, Spindle-Type Anchors with Washers: Plate-formed from perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square, welded to projecting steel spindle with a diameter of 0.105 inch (2.67 mm) and length capable of holding insulation of thickness indicated securely in position with 1-1/2-inch- (38-mm-) square or diameter self-locking washers complying with the following:
  - 1. Washers formed from 0.016-inch- (0.41-mm-) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than in place.
  - 2. Where anchors are located in ceiling plenums provide capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap.
- B. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain 1-inch (25-mm) air space between face of insulation and substrate to which anchor is attached.
- C. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other condition affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

### **3.3 INSTALLATION**

- A. General: Install insulation to comply with insulation manufacturer's written instructions applicable to products and application indicated. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- B. Install perimeter insulation on vertical surfaces by setting units in adhesive.
  - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.
  - 2. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection board set in adhesive.

- C. Protect top surface of perimeter underslab insulation from damage during concrete work by applying protection board.
- D. Installation of General Building Insulation: Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
  - 1. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant.
  - 2. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
    - a. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
  - 3. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
    - a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
    - b. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm) support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
  - 5. For wood-framed construction, install mineral-fiber blankets according to ASTM C 1320 and as follows:
    - a. With faced blankets having stapling flanges, secure insulation by inset, stapling flanges to sides of framing members.
    - b. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place.
  - 6. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
    - a. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions.
    - b. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
    - c. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
    - d. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

7. Retain insulation in place by metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated between insulation and glass.

**END OF SECTION 07210**

**SECTION 07241 OUTSULATION® LCMD SYSTEMS™ 1-5**

**PART I GENERAL**

**1.01 SUMMARY**

- A. This document is to be used in preparing specifications for projects utilizing the Dryvit Light Commercial MD Systems. For complete product description and usage refer to:
1. Dryvit Outsulation LCMD Systems 1-5 Data Sheet, [DS838](#)
  2. Dryvit Outsulation LCMD Systems 1-5 Application Instructions, [DS172](#)
  3. Dryvit Outsulation LCMD Systems 1-5 Installation Details, [DS170](#)
- B. Related Sections
1. Unit Masonry – Section 04810
  2. Concrete – Sections 03300
  3. Wood Framing – Section 06100
  4. Sealant – Section 07920
  5. Water Resistive and Air Barriers – Section 07271

**1.02 REFERENCES**

- A. Section Includes
1. ASTM B 117 (Federal Test Standard 141A Method 6061) Standard Practice for Operating Salt Spray (Fog) Apparatus
  2. ASTM C 150 Standard Specification for Portland Cement
  3. ASTM C 297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
  4. ASTM C 1063 Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
  5. ASTM C 1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
  6. ASTM C 1396 (formerly C 79) Standard Specification for Gypsum Board
  7. ASTM D 968 (Federal Test Standard 141A Method 6191) Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
  8. ASTM D 1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
  9. ASTM D 2247 (Federal Test Standard 141A Method 6201) Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
  10. ASTM D 2898 Standard Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
  11. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
  12. ASTM D 4060 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
  13. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
  14. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
  15. ASTM E 330 Test Method for Structural Performance of Exterior Windows, Doors and Curtain Walls by Uniform Static Air Pressure Difference
  16. ASTM E 331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference
  17. ASTM E 2098 Test Method for Determining the Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to Sodium Hydroxide Solution
  18. ASTM E 2134 Test Method for Evaluating the Tensile-Adhesion Performance of Exterior Insulation and Finish Systems (EIFS)
  19. ASTM E 2273 Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies
  20. ASTM E 2430 Standard Specification for Expanded Polystyrene (EPS) Thermal

- Insulation Boards for use in Exterior Insulation and Finish Systems (EIFS)
21. ASTM E 2485 (formerly EIMA Std. 101.01) Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water-Resistive Barrier Coatings
  22. ASTM E 2486 (formerly EIMA Std. 101.86) Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
  23. ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems
  24. ASTM G 155 (Federal Test Standard 141A Method 6151) Standard Practice for Operating-Xenon Arc Light Apparatus, for Exposure of Nonmetallic Materials
  25. Mil Std E5272 Environmental Testing
  26. Mil Std 810B Environmental Test Methods
  27. NFPA 268 Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
  28. NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non Load-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus

### **1.03 DEFINITIONS**

- A. Base Coat: Material used to encapsulate one or more layers of reinforcing mesh fully embedded that is applied to the outside surface of the EPS.
- B. Building Expansion Joint: A joint through the entire building structure designed to accommodate structural movement.
- C. Contractor: The contractor that installs the Outsulation LCMD Systems 1-5 to the substrate.
- D. Dryvit: Dryvit, the manufacturer of the Outsulation LCMD Systems 1-5, a Rhode Island corporation.
- E. Expansion Joint: A structural discontinuity in the Outsulation LCMD Systems 1-5.
- F. Finish: An acrylic-based coating, available in a variety of textures and colors that is applied over the base coat.
- G. Insulation Board: Expanded Polystyrene (EPS) insulation board, which is affixed to the substrate and creates a layer of continuous insulation.
- H. Mechanical Fasteners: A combination of polypropylene washers and corrosion resistant fasteners used to secure the insulation board to the substrate.
- I. Reinforcing Mesh: Glass fiber mesh(es) used to reinforce the base coat and to provide impact resistance.
- J. Sheathing: A substrate in sheet form.
- K. Substrate: The material to which the Outsulation LCMD Systems 1-5 is affixed.
- L. Substrate System: The total wall assembly including the attached substrate to which the water-resistive barrier is affixed.

### **1.04 SYSTEM DESCRIPTION**

- A. General: The Dryvit Outsulation LCMD Systems 1-5 is an Exterior Insulation and Finish System (EIFS) Class PB, designed for use on noncombustible or combustible type construction. Outsulation LCMD Systems 1-5 is installed over a code approved water-resistive barrier (sheet type) and consists of a drainage medium and drainage accessory, expanded polystyrene insulation board, adhesive or mechanical attachment method, base coat, reinforcing mesh(es) and finish.
- B. Acceptable system configuration options include:

<b>System Configuration</b>	<b>Water-Resistive Barrier</b>	<b>Drainage Medium</b>	<b>EPS Minimum Thickness</b>	<b>Attachment</b>	<b>Base Coat</b>
1	Sheet membrane	Drainage Mat	1 in (25 mm)	Mechanical Fasteners	Genesis® or Genesis® DM
2	Tyvek® StuccoWrap	N/A	1 in (25 mm)	Mechanical Fasteners	Genesis or Genesis DM

3	Sheet membrane	Grooved Insulation Board	1 1/2 in (38 mm)	Mechanical Fasteners	Genesis or Genesis DM
4	Sheet membrane	Expanded Metal Lath	1 in (25 mm)	Adhesive	All
5	Sheet membrane	Ultra Lath	1 in (25 mm)	Adhesive	All

**C. Design Requirements:**

1. Acceptable substrates for the Outsulation LCMD System shall be:
  - a. APA Exterior or Exposure 1 Rated Plywood, Grade C-D or better, nominal 1/2 in (12.7 mm), minimum, installed with the C face out.
2. Deflection of substrate systems shall not exceed 1/240 times the span.
3. The substrate shall be flat within 1/4 in (6.4 mm) in a 4 ft (1.2 m) radius.
4. The slope of inclined surfaces shall not be less than 6:12. The length of inclined surfaces shall not exceed 12 in (305 mm).
5. Expansion joints:
  - a. Design and location of expansion joints in the Outsulation LCMD Systems 1-5 is the responsibility of the project designer and shall be noted on the project drawings. As a minimum, expansion joints shall be placed at the following locations:
    - 1) Where expansion joints occur in the substrate system
    - 2) Where building expansion joints occur
    - 3) At floor lines in wood frame construction
    - 4) At floor lines of non-wood framed buildings where significant movement is expected
    - 5) Where the Outsulation LCMD Systems 1-5 abuts dissimilar materials
    - 6) Where the substrate type changes
    - 7) Where prefabricated panels abut one another
    - 8) In continuous elevations at intervals not exceeding 75 ft (23 m)
    - 9) Where significant structural movement occurs such as changes in roofline, building shape or structural system
6. Terminations
  - a. Prior to applying the Dryvit Outsulation LCMD Systems 1-5, wall openings shall be treated with Flashing Tape. Refer to Dryvit Outsulation LCMD Systems 1-5 Installation Details, [DS170](#).
  - b. The Outsulation LCMD Systems 1-5 shall be held back from adjoining materials around openings and penetrations such as windows, doors and mechanical equipment a minimum of 3/4 in (19 mm) for sealant application. See Dryvit's Outsulation LCMD Systems 1-5 Installation Details, [DS170](#).
  - c. The systems shall be terminated a minimum of 8 in (203 mm) above finished grade.
  - d. Sealants
    - 1) Shall be manufactured and supplied by others
    - 2) Shall be compatible with the Outsulation LCMD Systems 1-5 materials. Refer to current Dryvit publication [DS153](#), for a listing of sealants tested by sealant manufacturer for compatibility.
    - 3) The sealant backer rod shall be closed cell.
7. Flashing: Shall be provided at all roof-wall intersections, windows, doors, chimneys, decks, balconies, and other areas as necessary to prevent water from entering behind the Outsulation LCMD Systems 1-5.
8. Site Coated EPS Shapes and Starter Boards: Shall be coated on site utilizing the same materials (EPS, base material mixture, reinforcing mesh, and finish) as specified for the project.
9. Machine Coated EPS Shapes and Starter Boards: Shall be produced by Tremco CPG. The term of the warranty may be extended for an additional 2 years with the use of Tremco-produced Machine Coated Starter Boards.



**D. Performance Requirements**

1. The Outsulation LCMD Systems 1-5 shall have been tested as follows:

**a. Durability**

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Abrasion Resistance</b>	ASTM D 968	No deleterious effects after 528 quarts (500 liters)	No deleterious effects after 1056 quarts (1000 liters)
<b>Accelerated Weathering</b>	ASTM G 155 Cycle 1*	No deleterious effects after 2000 hours	No deleterious effects after 5000 hours
	ASTM G 154 Cycle 1* (QUV)		No deleterious effects after 5000 hours
<b>Freeze-Thaw</b>	ASTM E 2485 Method A*	No deleterious effects after 60 cycles	Passed - No deleterious effects after 90 cycles
	ASTM C 67 modified	No deleterious effects after 60 cycles	Passed - No deleterious effects after 60 cycles
	ASTM E 2485 Method B*	No deleterious effects after 10 cycles	Passed - No deleterious effects after 10 cycles
<b>Mildew Resistance</b>	ASTM D 3273	No growth during 28 day exposure period	No growth during 60 day exposure period
<b>Water Resistance</b>	ASTM D 2247*	No deleterious effects after 14 days exposure	No deleterious effects after 42 days exposure
<b>Taber Abrasion</b>	ASTM D 4060	N/A	Passed 1000 cycles
<b>Salt Spray Resistance</b>	ASTM B 117*	No deleterious effects after 300 hours exposure	No deleterious effects after 1000 hours exposure
<b>Water Penetration</b>	ASTM E 331*	No water penetration beyond the inner-most plane of the wall after 15 minutes at 2.86 psf (137 Pa)	Passed
<b>Water Vapor Transmission</b>	ASTM E 96 Procedure B*	Vapor permeable	EPS 5 perm-inch Base Coat <sup>1</sup> 40 Perms Finish <sup>2</sup> 40 Perms
<b>Drainage Efficiency</b>	ASTM E 2273	Minimum Drainage Efficiency of 90%	Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.  
1. Base Coat perm value based on Dryvit Genesis  
2. Finish perm value based on Dryvit Quarzputz

**b. Structural**

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Tensile Bond</b>	ASTM C 297/E 2134*	Minimum 15 psi (104 kPa) – insulation failure	Minimum 19.1 psi (132 kPa)
<b>Transverse Wind Load</b>	ASTM E 330*	Withstand positive and negative wind loads as specified by the building code	Systems 4 & 5: Minimum 90 psf (4.3 kPa) <sup>1</sup> 16 inch o.c. framing, 1/2 in sheathing screw attached at 8 inch (203 mm) o.c.

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.  
1. Adhesive attachment; mechanical fastener attachment results are based on fastener patterns, refer to Dryvit Application Bulletin 00-04.

**c. Impact Resistance: In accordance with ASTM E 2486\* (formerly EIMA Standard 101.86).**

Reinforcing Mesh <sup>1/</sup> oz/yd <sup>2</sup> (Weight g/m <sup>2</sup> )	Minimum Tensile Strengths	EIMA Impact Classification	EIMA Impact Range in-lbs (Joules)		Impact Test Results in-lbs (Joules)	
Standard - 4.3 (146)	150 lbs/in (27 g/cm)	Standard	25-49	(3-6)	36	(4)
Standard Plus - 6 (203)	200 lbs/in (36 g/cm)	Medium	50-89	(6-10)	56	(6)
Intermediate - 12 (407)	300 lbs/in (54 g/cm)	High	90-150	(10-17)	108	(12)
Panzer <sup>®</sup> 15 <sup>2</sup> - 15 (509)	400 lbs/in (71 g/cm)	Ultra High	>150	(>17)	162	(18)
Panzer 20 <sup>2</sup> - 20.5 (695)	550 lbs/in (98 g/cm)	Ultra High	>150	(>17)	352	(40)

<b>Detail Mesh<sup>®</sup> Short Rolls - 4.3 (146)</b>	<b>150 lbs/in (27 g/cm)</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>
<b>Corner Mesh<sup>™</sup> - 7.2 (244)</b>	<b>274 lbs/in (49 g/cm)</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.

1. It shall be colored blue for product identification bearing the Dryvit logo.
2. Shall be used in conjunction with Standard Mesh (recommended for areas exposed to high traffic).

d. Fire performance

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Fire Resistance</b>	ASTM E 119	No effect on the fire resistance of a rated wall assembly	Passed 1 hour
<b>Ignitability</b>	NFPA 268*	No ignition at 12.5 kw/m <sup>2</sup> at 20 minutes	Passed
<b>Intermediate Multi-Story Fire Test</b>	NFPA 285* (UBC 26-9)	<ol style="list-style-type: none"> <li>1. Resist flame propagation over the exterior surface</li> <li>2. Resist vertical spread of flame within combustible core/component of panel from one story to the next</li> <li>3. Resist vertical spread of flame over the interior surface from one story to the next</li> <li>4. Resist lateral spread of flame from the compartment of fire origin to adjacent spaces</li> </ol>	Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.

2. The Outsulation LCMD Systems 1-5 components shall be tested for:

a. Fire

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Surface Burning Characteristics</b>	ASTM E 84*	All components shall have a: Flame Spread ≤ 25 Smoke Developed ≤ 450	Passed

\* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.

b. Durability

TEST	TEST METHOD	CRITERIA	RESULTS
<b>Reinforcing Mesh Alkali Resistance of Reinforcing Mesh</b>	ASTM E 2098*	120 pli (> 21dN/cm) retained tensile strength after exposure	Passed
<b>EPS (Physical Properties) Density</b>	ASTM C 303, D 1622	0.95-1.25 lb/ft <sup>3</sup> (15.2-20.0 kg/m <sup>3</sup> )	Passed
<b>Thermal Resistance</b>	ASTM C 177, C 518	4.0 @ 40 °F (4.4 °C) 3.6 @ 75 °F (23.9 °C)	Passed Passed
<b>Water Absorption</b>	ASTM C 272	2.5 % max. by volume	Passed
<b>Oxygen Index</b>	ASTM D 2863	24% min. by volume	Passed
<b>Compressive Strength</b>	ASTM D 1621 Proc. A	10 psi (69 kPa) min	Passed
<b>Flexural Strength</b>	ASTM C 203	25 psi (172 kPa) min.	Passed

<b>Flame Spread</b>	ASTME 84*	25 max.	Passed
<b>Smoke Developed</b>	ASTM E 84*	450 max.	Passed
* ASTM E 2568 Standard Specification for PB Exterior Insulation and Finish Systems.			

### **1.05 SUBMITTALS**

- A. Product Data: The contractor shall submit to the owner/architect the manufacturer's product data sheets describing the products, which will be used on this project.
- B. Shop Drawings for Panelized Construction: The panel fabricator shall prepare and submit to the owner/architect complete drawings showing: wall layout, connections, details, expansion joints, and installation sequence.
- C. Samples: The contractor shall submit to the owner/architect two (2) samples of the Outsulation LCMD Systems 1-5 for each finish, texture and color to be used on the project. The same tools and techniques proposed for the actual installation shall be used. Samples shall be of sufficient size to accurately represent each color and texture being utilized on the project.
- D. Test Reports: When requested, the contractor shall submit to the owner/architect copies of selected test reports verifying the performance of the Outsulation LCMD Systems 1-5.
- E. Environmental Product Declaration: When requested, the contractor shall submit to the owner/architect copies of the Environmental Product Declaration (EPD) describing the estimated environmental impacts of the Outsulation LCMD System.

### **1.06 QUALITY ASSURANCE**

#### **A. Qualifications**

- 1. System Manufacturer: Shall be Dryvit. All materials shall be manufactured or sold by Dryvit and shall be purchased from Dryvit or its authorized distributors.
  - a. Materials shall be manufactured at a facility covered by a current ISO 9001:2015 and ISO 14001:2015 certification. Certification of the facility shall be done by a registrar accredited by the American National Standards Institute, Registrar Accreditation Board (ANSI-RAB).
- 2. Contractor: Shall be knowledgeable in the proper installation of the Dryvit Outsulation LCMD Systems 1-5 and shall be experienced and competent in the installation of Exterior Insulation and Finish Systems. Additionally, the contractor shall possess a current Trained Contractor Certificate\* issued by Dryvit for Moisture Drainage Systems.
- 3. Insulation Board Manufacturer: Shall be listed by Dryvit, shall be capable of producing the Expanded Polystyrene (EPS) in accordance with the current Dryvit Specification for Insulation Board, [DS131](#), and shall subscribe to the Dryvit Third Party Certification and Quality Assurance Program.
- 4. Panel Fabricator: Shall be a contractor experienced and competent in the fabrication of architectural wall panels and shall possess a current Trained Contractor Certificate\* issued by Dryvit for Moisture Drainage Systems.
- 5. Panel Erector: Shall be experienced and competent in the installation of architectural wall panel systems and shall be:
  - a. The panel fabricator or
  - b. An erector approved by the panel fabricator or
  - c. An erector under the direct supervision of the panel fabricator
- 6. Machine Coated EPS Shapes and Starter Boards: Shall be produced by Tremco CPG. The term of the warranty may be extended for an additional 2 years with the use of Tremco-produced Machine Coated Starter Boards.

#### **B. Regulatory Requirements:**

- 1. The EPS shall be separated from the interior of the building by a minimum 15-minute thermal barrier.

2. The use and maximum thickness of EPS shall be in accordance with the applicable building code(s).
- C. Certification
  1. The Outsulation LCMD Systems 1-5 shall be recognized for the intended use by the applicable building code(s).
- D. Mock-Up
  1. The contractor shall, before the project commences, provide the owner/architect with a mock-up for approval.
  2. The mock-up shall be of suitable size as required to accurately represent the products being installed, as well as each color and texture to be utilized on the project.
  3. The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual applications. The finish used shall be from the same batch that is being used on the project.
  4. The approved mock-up shall be available and maintained at the jobsite.
  5. For panelized construction, the mock-up shall be available and maintained at the panel fabrication location.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. All Dryvit materials shall be delivered to the job site in the original, unopened packages with labels intact.
- B. Upon arrival, materials shall be inspected for physical damage, freezing or overheating. Questionable materials shall not be used.
  1. Materials shall be stored at the job site, and at all times, in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be as follows:
    - a. DPR, PMR™, HDP™, Weatherlastic® and E™ Finishes, Color Prime™, Primus®, Genesis® and NCB™: 40 °F (4 °C).
    - b. For other products, refer to specific product data sheets.
  2. Maximum storage temperature shall not exceed 100 °F (38 °C). NOTE: Minimize exposure of materials to temperatures over 90 °F (32 °C). Finishes exposed to temperatures over 110 °F (43 °C) for even short periods may exhibit skinning, increased viscosity and should be inspected prior to use.
- C. Protect all products from inclement weather and direct sunlight.

#### **1.08 PROJECT CONDITIONS**

- A. Environmental Requirements
  1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.
  2. At the time of Dryvit product application, the air and wall surface temperatures shall be from 40 °F (4 °C) minimum to 100 °F (38 °C) maximum for the following products:
    - a. DPR, PMR, HDP, Weatherlastic and E Finishes, Color Prime, Primus, Genesis and NCB.
  3. For other products, refer to specific product data sheets. These temperatures shall be maintained with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for Weatherlastic Finishes, Ameristone, and TerraNeo) thereafter, or until the products are completely dry. Refer to published product data sheets for more specific information.
- B. Existing Conditions: The contractor shall have access to electric power, clean water and a clean work area at the location where the Dryvit materials are to be applied.

#### **1.09 SEQUENCING AND SCHEDULING**

- A. Installation of the Outsulation LCMD Systems 1-5 shall be coordinated with other construction trades.
- B. Sufficient manpower and equipment shall be employed to ensure a continuous operation, free of cold joints, scaffold lines, texture variations, etc.

**1.10 WARRANTY**

- A. Dryvit shall provide a written limited materials warranty against defective material upon written request. Dryvit shall make no other warranties, expressed or implied. Dryvit does not warrant workmanship. Full details are available from Dryvit
- B. The applicator shall warrant workmanship separately. Dryvit shall not be responsible for workmanship associated with installation of the Outsulation LCMD Systems 1-5.

**1.11 DESIGN RESPONSIBILITY**

- A. It is the responsibility of both the specifier and the purchaser to determine if a product is suitable for their intended use. The designer selected by the purchaser shall be responsible for all decisions pertaining to design, detail, structural capability, attachment details, shop drawings and the like. Dryvit has prepared guidelines in the form of specifications, installation details, and product data sheets to facilitate the design process only. Dryvit is not liable for any errors or omissions in design, detail, structural capability, attachment details, shop drawings, or the like, whether based upon the information prepared by Dryvit or otherwise, or for any changes which purchasers, specifiers, designers, or their appointed representatives may make to Dryvit's published comments.

**1.12 MAINTENANCE**

- A. Maintenance and repair shall follow the procedures noted in the Dryvit Outsulation LCMD Systems 1-5 Application Instructions, [DS172](#).
- B. All Dryvit products are designed to require minimal maintenance. However, as with all building products, depending on location, some cleaning may be required. See Dryvit publication [DS152](#) on Cleaning and Recoating.
- C. Sealants and Flashings shall be inspected on a regular basis and repairs made as necessary.

**PART II PRODUCTS**

**2.01 MANUFACTURER**

- A. All components of the Outsulation LCMD Systems 1-5 shall be supplied or obtained from Dryvit or its authorized distributors. Substitutions or additions of materials other than specified will void the warranty.

**2.02 MATERIALS**

- A. Portland Cement: Shall be Type I, gray in color, fresh and free of lumps.
- B. Water: Shall be clean and free of foreign matter.

**2.03 COMPONENTS**

- A. Air/Water-Resistive Barrier Components:
  - 1. Sheet Type Membranes (by others)
    - a. Code approved water-resistive barrier such as but not limited to Dupont Tyvek StuccoWrap, Tyvek Home Wrap or Commercial Wrap, #15 Felt, Grade D Paper.
- B. Flashing Materials: Used to protect substrate edges at terminations.
- C. TREMPRO CHEM X PRO™: A moisture cure, urethane-based adhesive used to adhere the Dryvit Drainage Strip™ and Drainage Track
- D. Accessories
  - 1. Drainage Track: UV treated PVC perforated "J" channel with weep holes, complying with ASTM D 1784 and ASTM C 1063. [DS170](#). Shall be one of the following:

- 1) Starter Trac STDE - with drip edge by Plastic Components, Inc.
- E. Drainage Medium:
  1. Tyvek Commercial Wrap – D (by others) or equal: A spunbonded high density polyethylene that is textured to provide vertical drainage channels.
- F. Insulation Board: Expanded Polystyrene meeting the Dryvit Specification for Insulation Board, [DS131](#), and the following requirements:
  1. In the absence of specific wind load requirements, the thickness of the insulation board shall be minimum 1 in (25 mm).
  2. The insulation board shall be manufactured by a board supplier listed by Dryvit
- G. Machine Coated EPS Shapes and Starter Boards: Shall be supplied by a manufacturer that subscribes to the Dryvit third party certification and quality assurance program.
- H. Mechanical fasteners consist of a 2 in (51 mm) diameter polypropylene washer with key openings for base coat penetration and recessed chamber, used in conjunction with a corrosion resistant fastener.
  1. Washer
    - 1) Shall be Wind-lock Wind-Devil or Wind-Devil 2™, or ITW Buildex Grid-Mate™ PB and Grid-Master washer.
  2. Screws
    - 1) Wood Based Substrates and Light Gauge Metal (20 - 26 ga)
      - 1) Shall be minimum No. 6 bugle head corrosion resistant screws.
      - 2) The screws shall be of sufficient length to penetrate wood substrates a minimum of 3/4 in (19 mm) and metal framing a minimum of 3/8 in (9.5 mm).
    - 2) Steel Framing (12 - 20 ga)
      - 1) Shall be minimum No. 6 bugle head corrosion resistant screws, drill point
      - 2) The screws shall be of sufficient length to penetrate the steel framing a minimum of 3/8 in (9.5 mm).
  3. Brick, Block and Concrete
    - 1) Anchors shall be a minimum 3/16 in (4.8 mm) diameter and corrosion resistant.
    - 2) Anchors shall be of sufficient length to penetrate the substrate a minimum of 1 in (25 mm).
    - 3) Pullout values shall be substantiated for the particular substrate and fastener used.
- I. Adhesives: Used to adhere the EPS to Expanded Metal Lath or Ultra Lath.
  1. Cementitious: A liquid polymer-based material, which is field mixed with Portland cement.
    - 1) Shall be Primus or Genesis
  2. Ready mixed: A dry blend cementitious, copolymer-based product, field mixed with water
    - 1) Shall be Primus DM, Genesis DM, Genesis DMS, Rapidry DM 35-50 or Rapidry DM 50-75.
- J. Base Coat: Shall be compatible with the EPS insulation board and reinforcing mesh(es).

NOTE: When installing the system with mechanical fasteners the base coat shall be either Genesis or Genesis DM.

  1. Cementitious: A liquid polymer-based material, which is field mixed with Portland cement.
    - 1) Shall be Primus or Genesis
  2. Non-cementitious: A factory-mixed, fully formulated, water-based product.
    - 1) Shall be NCB  
  3. Ready mixed: A dry blend cementitious, copolymer-based product, field mixed with water.
    - 1) Shall be Primus DM, Genesis DM, Genesis DMS, Rapidry DM 35-50 or Rapidry 50-75
- K. Reinforcing Mesh: A balanced, open weave, glass fiber fabric treated for compatibility with other system materials.
  1. Shall be Standard, Detail and Corner Mesh.
- L. Finish: Shall be the type, color and texture as selected by the architect/owner and shall be one or more of the following:
  1. Standard DPR (Dirt Pickup Resistance): Water-based, acrylic finish with integral color and texture and formulated with DPR chemistry:
    - 1) Sandpebble® Fine DPR: Fine pebble texture



2. Coatings, Primers and Sealers:
  - 1) Demandit® Advantage™

### **PART III EXECUTION**

#### **3.01 EXAMINATION**

- A. Prior to installation of the Outsulation LCMD Systems 1-5, the contractor shall verify that the substrate:
  1. Is of a type listed in Section 1.04.C.1
  2. Is flat within 1/4 in (6.4 mm) in a 4 ft (1.2 m) radius.
  3. Is sound, dry, connections are tight, have no surface voids, projections, or other conditions that may interfere with the Outsulation LCMD Systems 1-5 installation or performance.
- B. Prior to the installation of the Outsulation LCMD Systems 1-5, the architect or general contractor shall ensure that all needed flashings and other waterproofing details have been completed, if such completion is required prior to the Outsulation LCMD Systems 1-5 application. Additionally, the contractor shall ensure that:
  1. Metal roof flashing has been installed in accordance with the manufacturer's requirements, Asphalt Roofing Manufacturers Association (ARMA) Standards and Dryvit Outsulation LCMD Systems 1-5 Installation Details, [DS170](#), or as otherwise necessary to maintain a watertight envelope.
  2. Openings are flashed in accordance with the Outsulation LCMD Systems 1-5 Installation Details, [DS170](#), or as otherwise necessary to prevent water penetration.
  3. Chimneys, balconies and decks have been properly flashed.
  4. Windows, doors, etc. are installed and flashed per manufacturer's requirements and the Outsulation LCMD Systems 1-5 Installation Details, [DS170](#).
  5. Sheet type membrane water-resistive barriers have been installed in a weatherboard fashion in accordance with building code and manufacturer's requirements.
- C. Prior to the installation of the Outsulation LCMD Systems 1-5, the contractor shall notify the general contractor and/or architect and/or owner of all discrepancies.

#### **3.02 PREPARATION**

- A. The Outsulation LCMD Systems 1-5 materials shall be protected by permanent or temporary means from inclement weather and other sources of damage prior to, during, and following application until completely dry.
- B. Protect adjoining work and property during Outsulation LCMD Systems 1-5 installation.

#### **3.03 INSTALLATION**

- A. The systems shall be installed in accordance with the Dryvit Outsulation LCMD Systems 1-5 Application Instructions, [DS172](#).
- B. The overall minimum base coat thickness shall be sufficient to fully embed the mesh. The recommended method is to apply the base coat in two (2) passes.
- C. Sealant shall not be applied directly to textured finishes or base coat surfaces. Dryvit Outsulation LCMD Systems 1-5 surfaces in contact with sealant shall be coated with Demandit Smooth or Color Prime.
- D. High impact meshes shall be installed as specified at ground level, high traffic areas, and other areas exposed to or susceptible to impact damage.
- E. The installation of Pre-Coated EPS Shapes and Starter Boards shall be in accordance with Dryvit Publication [DS854](#).

#### **3.04 FIELD QUALITY CONTROL**

- A. The contractor shall be responsible for the proper application of the Outsulation LCMD Systems 1-5 materials.

- B. Dryvit assumes no responsibility for on-site inspections or application of its products.
- C. If required, the contractor shall certify in writing the quality of work performed relative to the substrate system, details, installation procedures, workmanship and the specific products used.
- D. If required, the EPS supplier shall certify in writing that the EPS meets Dryvit's specifications.
- E. If required, the sealant contractor shall certify in writing that the sealant application is in accordance with the sealant manufacturer's and Dryvit's recommendations.

**3.05 CLEANING**

- A. All excess Outsulation LCMD Systems 1-5 materials shall be removed from the job site by the contractor in accordance with contract provisions and as required by applicable law.
- B. All surrounding areas, where the Dryvit Outsulation LCMD Systems 1-5 has been applied, shall be left free of debris and foreign substances resulting from the contractor's work.

**3.06 PROTECTION**

- A. Outsulation LCMD Systems 1-5 shall be protected from inclement weather and other sources of damage until dry and permanent protection in the form of flashings, sealants, etc. are installed.

**END OF SECTION 07241**



**SECTION 07260 – UNDER-SLAB VAPOR RETARDER**

**PART 1 – GENERAL**

**1.1 SUMMARY**

**A. Products Supplied Under This Section**

1. Vapor Retarder, Seam Tape & Accessories manufactured for installation under concrete slabs.
2. Only 100% high-grade virgin polyolefin resins – No Recycled Polyethylene.
3. Only products which have minimum thickness of 15 mils for plastic membrane.
4. Only products manufactured in the USA and marketed and sold by a true manufacturer- No private label / No imported products / No outsourced products.
5. Only products from manufacturer with local field Technical Representatives.
6. Only products from ISO 9001 Certified Manufacturers.
7. Only products from manufacturer that will provide NO CHARGE on-site review of installations prior to placement of concrete.
8. Only products and accessories which are stocked, supplied and readily available as needed in project locale.
9. Only products which are manufactured for the following uses in protecting against – moisture, radon gas, methane gas and sulphates.
10. Only products which have WVPR of 0.024 (WVTR of 0.007) or less – Products with WVPR higher than 0.024 will NOT be accepted.
11. Only products by manufacturer that will provide current independent third (3<sup>rd</sup>) party testing results; third (3<sup>rd</sup>) party testing to be provided by the manufacturer; and not the marketing, private label or outsourcing party. The ACTUAL manufacturer name and address must be identified when submitted. Must provide a “Certificate of Origin” when requested.
12. Only products by a manufacturer providing current Letters of Certification.
13. Contact Jeff Daniels [jeff.daniels@prodigy.net](mailto:jeff.daniels@prodigy.net) or phone (636) 299-3218 for under-slab vapor retarder product details and installation information –or Inteplast Group [info@barrierbac.com](mailto:info@barrierbac.com), P: 877-535-0555
14. Contact [info@barrierbac.com](mailto:info@barrierbac.com) for specific information on how Barrier-Bac contributes to project LEED rating, and/or ASTM E-2129 (Standard Practice for Data Collection for Sustainability Assessment of Building Products)

**B. Related Sections**

1. Section 03300 Cast-In-Place Concrete.

**1.2 REFERENCES**

**A. American Society for Testing and Materials (ASTM)**

1. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
2. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
3. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
4. ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
5. ASTM D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.

**B. American Concrete Institute (ACI)**

1. ACI 302.1R-04 Vapor Barrier Component (plastic membrane) is not less than 10 mils thick.

**1.3 SUBMITTALS**

- A. Quality Control / Assurance
1. Submit CURRENT Laboratory test results showing compliance with ASTM & ACI Standards.
  2. Submit CURRENT Third Party test results.
  3. Submit Manufacturers Product Samples & Literature.
  4. Manufacturer's installation instructions for placement, seaming and pipe boot installation.
  5. Products that DO NOT MEET ALL criteria in section 1.1A – 1 through 14 will not be accepted.

**PART 2 – PRODUCTS**

**2.1 MATERIALS**

- A. Vapor Retarder
1. Must be 100% high-grade virgin resin High Density Polyethylene (HDPE) vapor retarder film. Film thickness alone must be minimum 15 mils – reinforcing scrims, backing cannot be basis for minimum mil thickness.
    - a. Water Vapor Permeance ASTM E 96 0.024 perms (US)
    - b. Water Vapor Barrier ASTM E 1745 Exceeds Class A (Plastics)
    - c. Tensile Strength ASTM D 882 63 lbs / in
    - d. Puncture Resistance ASTM D 1709 2750 grams
    - e. Peel Adhesion to Concrete ASTM D 903 4 lbs / in
    - f. Life Expectancy ASTM E 154 Indefinite
    - g. Chemical Resistance ASTM E 154 Unaffected
  2. Vapor Retarder Products
    - a. Barrier-Bac VB-350 by Inteplast Group - 800-452-2117 - [www.barrierbac.com](http://www.barrierbac.com)
    - b. Underslab 2 by Polyguard Products - 800-541-4994 - [www.polyguardproducts.com](http://www.polyguardproducts.com)
    - c. Premoulded Membrane by W.R. Meadows - 800-342-5976 - [www.wrmeadows.com](http://www.wrmeadows.com)
    - d. Zero-Perm by Alumiseal - 800-235-2313 - [www.alumiseal.com](http://www.alumiseal.com)
    - e. Florprufe 120 by Grace Construction Products - [www.na.graceconstruction.com](http://www.na.graceconstruction.com)
    - f. Other products submitted must meet ALL criteria in section 1.1A – 1 through 14.
    - g. Products that do not have local manufacturer field representative will not be accepted.

If greater concrete peel adhesion (more than 4 lbs / in) is required by architect/engineer such as, post tension concrete; fiber reinforced concrete applications; shifting/expansive soil conditions; when critical finish is needed (such as colored, stained or polished concrete applications); or when being utilized in Brownfield Development Projects – the Barrier-Bac VBC-350 (Composite) Membrane may be more suitable.

- h. Barrier-Bac VBC-350 by Inteplast Group – 877-535-0555 – [www.barrierbac.com](http://www.barrierbac.com)

**2.2 ACCESSORIES**

- A. Seam Options
1. Seam Tape must have the following qualities:
    - a. Water Vapor Permeance ASTM E 96 0.3 Perms
    - b. Tensile Strength ASTM D 882 22 lbs/ in. minimum

2. Seam Tape
  - a. Barrier-Bac Seam Tape by Inteplast - 877-535-0555 - [www.barrierbac.com](http://www.barrierbac.com)
3. Seam Welding
  - a. Seams may be heat welded if desired
  - b. Contact Inteplast at 877-535-0555 for heat welding assistance
- B. Pipe Boots
  1. Construct pipe boots from vapor retarder membrane & seam tape per manufacturer details.
- C. Multiple Penetrations (Options Based on Specific Jobsite Conditions)
  2. Construct pipe boots from vapor barrier material & seam tape per manufacturer details.
  3. Seal penetrations with seam tape per manufacturer details.
  4. Seal penetrations with liquid detail sealant (1-part or 2-part pourable self-leveling)
  5. Seal penetrations with bentonite clay granular.

### **PART 3 – EXECUTION**

#### **3.1 PREPARATION**

- A. Ensure that subsoil is approved by architect or geotechnical firm
  1. Level and tamp or roll aggregate, sand or tamped earth base

#### **3.2 INSTALLATION**

- A. Install Vapor Retarder:
  1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643-98
    - a. Unroll Vapor Retarder w/ the longest dimension parallel with the direction of the pour.
    - b. Lap Vapor Retarder over footings and seal to foundation walls.
    - c. Overlap joints 6 inches and seal with manufacturer's tape.
    - d. Seal all penetrations (including pipes) per manufacturer's instructions.
    - e. No penetration of the Vapor Retarder is allowed except for reinforcing steel and permanent utilities.
    - f. Repair damaged areas by cutting patches of Vapor Retarder, overlapping damaged area 6 inches and taping all four sides with tape.
    - g. Vapor Retarder installation to be inspected by field representative prior to concrete placement at no charge to owner, architect, engineer or contractor.
    - h. Architect to be notified when installation of Vapor Retarder is started to schedule field inspection.

**END OF SECTION 07260**

**SECTION 07271 WATER RESISTIVE and AIR BARRIER ASSEMBLIES**

**PART 1. GENERAL**

**1.1 Summary**

1. The section specifies TYPAR® DrainableWrap™ Commercial applied as a drainable water-resistive barrier and air barrier assembly on exterior walls
2. Install drainable water-resistive barrier on exterior side of wall sheathing as outlined in Installation Guide.

**1.2 References**

- a. ASTM E2773-18 "Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies."
- b. ASTM E96-95 "Standard Test Method for Water Vapor Transmission of Materials."
- c. AATCC-127 "Hydrostatic Head Test."
- d. ASTM D5733-9 Trapezoidal Test
- e. ASTM D5034, "Standard Test Method for Breaking Strength and Elongation of Textile Fabrics"
- f. ASTM D779 Dry Indicator Method, Water Penetration Resistance
- g. ASTM C765 "Standard Test Method for Low-Temperature Flexibility of Preformed Tape Sealants"
- h. ASTM E1677, "Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls"
- i. ASTM E2178, "Standard Test Method for Air Permeance of Building Materials"
- j. NFPA 285, "Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components"
- k. ASTM E84, "Standard Test Method for Surface Burning Characteristics of Building Materials"
- l. ASTM E2357, "Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies" must use TYPAR® Double-Sided Tape to tape WRB seams

**1.3 Submittals**

- a. Product Data. Submit manufacturer's product data and installation instructions.
- b. Samples. Submit 12" (300mm) square sample for approval.

**1.4 Quality Assurance**

- a. Submit copies of test results showing performance characteristics equaling or exceeding those specified.

**PART 2. PRODUCTS**

**2.1 Manufacturer**

- a. Berry Global, Inc., 70 Old Hickory Blvd, Old Hickory, TN 37138; +1 615-847-7000; [www.TYPAR.com](http://www.TYPAR.com)

**2.2 Water-Resistant Barrier**

- a. Spunbonded polypropylene weather membrane with a microporous coating and layer of integrated polypropylene fibers, nonwoven, nonperforated
- b. Performance Characteristics
  1. Drainage Efficiency: 96.7%, when tested in accordance with ASTM E2773
  2. Ultraviolet Exposure: Up to 12 months prior to exterior cladding coverage
  3. Accelerated Aging Cycling: No signs of failure at 21 days per AC38
  4. Air Penetration Resistance (Gurley Hill Porosity) [TAPPI T 460] [sec/100cc] >4800

5. Type I Air Barrier Material when tested in accordance with ASTM E1677
6. Type II Water-Resistive Barrier when tested in accordance with ASTM E2556
7. Water Vapor Transmission: 9-15 perms as tested by ASTM E96-90, Method A
8. Water Resistance Test: Exceeds one hour per ASTM D779
9. Basis Weight: 3.7 oz/yd<sup>2</sup> ASTM D5261
10. Air-Ins (Air Leakage Test) <.02L/S·M<sup>2</sup> @ 75 PA
11. Breaking Strength (Grab Tensile): 93 MD/95 CD lbs/in, when tested in accordance with ASTM D5034
12. Trapezoidal Test of 60/67 LBs when tested in accordance with ASTM D5733-9
13. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84 Flame Spread: Pass. Smoke Spread: Pass NFPA 285: Pass

c. Manufacturer's Warranty:

1. Limited product and limited system warranty available depending on the application, see the TYPAR® Weather Protection System Limited Warranty located at [www.TYPAR.com/downloads](http://www.TYPAR.com/downloads) for warranty details.

**2.3 Manufacturer's Accessory Products - Sealing Tape/Fasteners**

a. Tapes(s):

1. TYPAR® Construction Tape
  - i. Description:
    - a. Face Material Composition: Polyethylene Barrier
    - b. Face Color: Gray
    - c. Adhesive Composition: Acrylic
    - d. Thickness: 3.6mil
    - e. Dimensions: 1-7/8" x 165,' 3" x 165'
  - ii. Performance Characteristics:
    - a. Temperature Resistance: 0°F (-18°C) – Min. application temperature; 230°F (110°C) – Max application temperature.
    - b. Peel Adhesion PSTC-1.\*
    - c. Tensile Strength PSTC-31.\*
  - iii. Accessories:
    - a. Primer: Use 3M™ Super 77,™ Polyken® spray adhesive or equal
    - b. Flashing Tape: TYPAR® All-Temperature Flashing, TYPAR® Flexible Flashing, and TYPAR® Butyl Flashing.
    - c. Fastener: Fastener is dependent on substrate construction
    - d. Sealant: Must comply with ASTM C920 elastomeric polymer sealant
2. TYPAR® Double-Sided Seaming Tape
  - i. Description:
    - a. Face Material Composition: Paper Liner
    - b. Face Color: White paper liner, clear carrier film
    - c. Adhesive Composition: Acrylic
    - d. Thickness: 10.3 mils
    - e. Dimensions: 1.5" x 180'

- f. Must use TYPAR® Double-Sided Seaming Tape to tape WRB seams for ASTM 2357 certification & for ABAA certification compliance
    - ii. Performance Characteristics:
      - a. Temperature Resistance: 15°F (-9°C) – Min. application temperature; 200°F (92°C) – Max. application temperature.
      - b. Peel Adhesion PSTC-1.\*
      - c. Tensile Strength PSTC-31.\*
    - \*Pressure-Sensitive Tape Council.
    - iii. Accessories:
      - a. Primer: Polyken spray adhesive or equal
      - b. Flashing Tape: TYPAR® All-Temperature Flashing, TYPAR® Flexible Flashing, and TYPAR® Butyl Flashing
      - c. Fastener: Fastener is dependent on substrate construction
      - d. Sealant: Must comply with ASTM C920 elastomeric polymer sealant
- b. Flashing:
  - 1. TYPAR All-Temperature Flashing.
    - i. Description:
      - a. Face Material Composition: Polyethylene Barrier
      - b. Face Color: Gray
      - c. Adhesive Composition: Block Copolymer
      - d. Thickness: 16mil
      - e. Release Liner: Polyfilm
      - f. Dimensions: 4" x 75'; 6" x 75'; 9" x 75'; 12" x 75.'
    - ii. Performance Characteristics:
      - a. Low Temp Pliability ASTM C765 PASS.
      - b. Nail Sealability ASTM D1970 PASS.
      - c. Tensile Strength ASTM D5034-95 PASS.
      - d. Peel Adhesion ASTM D3330-04 PASS.
    - iii. Accessories:
      - a. Primer: Use 3M™ Super 77,™ Polyken spray adhesive or equal
      - b. Seam Tape: TYPAR® Construction Tape
      - c. Fastener: Fastener is dependent on substrate construction
      - d. Sealant: Must comply with ASTM C920 elastomeric polymer sealant
  - 2. TYPAR Butyl Flashing
    - i. Description:
      - a. Face Material Composition: Polyethylene Barrier
      - b. Face Color: Gray
      - c. Adhesive Composition: Butyl Rubber Adhesive
      - d. Thickness: 18.5mil
      - e. Release Liner: Kraft Paper
      - f. Dimensions: 4" x 75'; 6" x 75'; 9" x 75'; 12" x 75.'
    - ii. Performance Characteristics:
      - a. Low Temp Pliability ASTM C765 PASS.
      - b. Nail Sealability ASTM D1970 PASS.

- c. Tensile Strength ASTM D5034-95 PASS.
- iii. Accessories:
  - a. Primer: Use 3M™ Super 77,™ Polyken spray adhesive, or equal
  - b. Seam Tape: TYPAR Construction Tape
  - c. Fastener: Fastener is dependent on substrate construction
  - d. Sealant: Must comply with ASTM C920 elastomeric polymer sealant
- c. Recommended Sealants Against TYPAR Logo-Side Coating:
  - 1. Elastomeric polymer-based, butyl rubber, rubber-based, meeting ASTM C920 evaluation
- d. Recommended Fasteners for Wood, Insulated Sheathing Board, Exterior Gypsum:
  - 1. Plastic cap nails. 2. Plastic cap staples
- e. Recommended Fasteners for Steel Frame Construction:
  - 1. Rust-resistant screws with washers
- f. Recommended Fastening to Masonry:
  - 1. Sealant: Polyurethane-based, meeting ASTM C920 evaluation
  - 2. Mechanical: Masonry fastener with washer

### **PART 3. EXECUTION**

#### **3.1 Installation**

- A. TYPAR® DrainableWrap™ Commercial  
Install in accordance with manufacturer's instruction over exterior sheathing or open studs. Seal joints and penetrations through water-resistive barrier with specified tape and fasteners prior to installation of finish material. Air infiltration barrier shall be airtight and free from holes, tears, and punctures. All window and door penetrations are to be flashed and sealed per ASTM 2112, AAMA guidelines and manufacturer instructions. Cover with exterior cladding within 12 months of installation.
- B. TYPAR Double-Sided Seaming Tape
  - 1. Follow the TYPAR flashing installation procedures. Must use TYPAR Double-Sided Seaming Tape to tape WRB seams for ASTM 2357 certification & for ABAA certification compliance.
- C. TYPAR All-Temperature Flashing
  - 1. Follow the TYPAR flashing installation procedures.
- D. TYPAR Butyl Flashing
  - 1. Follow the TYPAR flashing installation procedures.

#### **3.2. Examination**

- A. TYPAR® DrainableWrap™ Commercial
  - 1. Verify substrate and surface conditions are in accordance with the flashing manufacturer's recommendation.
- B. TYPAR Double-Sided Seaming Tape
  - 1. Verify substrate and surface conditions are in accordance with the flashing

manufacturer's recommendation.

**C. TYPAR Butyl Flashing or TYPAR All-Temperature Flashing**

1. Verify substrate and surface conditions are in accordance with the flashing manufacturer's recommendation. NOTE: Flashing manufacturer recommends weather barrier be installed prior to the installation of the windows.

**3.2. Protection**

**A. TYPAR Butyl Flashing**

1. Protect installed self-adhesive and flashing tapes from damage during construction.

**B. TYPAR Construction Tape**

1. Protect installed flashing from damage during construction.

**END OF SECTION 07271**



**SECTION 07424 – COMPOSITE WALL PANELS**

• **PART 1 GENERAL**

• **1.1 SUMMARY**

1. Section Includes:

1. Composite wall panel wet joint, pressure-equalized rainscreen system, no insulation.
2. Accessories including sub girts, aluminum panel splines, aluminum panel bases, head flashings, clips, shims, fasteners, and aluminum trim prefinished to match aluminum wall panels.

**1.2 REFERENCES**

2. Reference Standards: Current edition at date of Bid.

3. ASTM International:

1. ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
2. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
3. ASTM D 294 - Method of Tumbler Test for Coke.
4. ASTM D 659 - Method of Evaluating Degree of Chalking of Exterior Paints.
5. ASTM D 882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
6. ASTM D 968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
7. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
8. ASTM D 2247 - Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
9. ASTM D 3352 - Standard Test Method for Strontium Ion in Brackish Water, Seawater, and Brines.
10. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

11. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
12. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
13. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

### **1.3 ADMINISTRATIVE REQUIREMENTS**

4. Coordination:
  1. Application of weather resistive barrier over exterior sheathing substrate specified.
  2. Sub- girt system as required to seal and make a continuous air barrier.
5. Preconstruction Meetings:
  1. Attendance: Contractor, Applicator, Owner, Architect, and those specifically requested to attend.
    1. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    2. Review methods and procedures related to aluminum composite panel installation, including manufacturer's written instructions.
    3. Examine support conditions for compliance with requirements, including alignment between and attachment to the structural members.
    4. Review flashings, special details, wall penetrations, openings, and condition of other construction that will affect aluminum wall panels.
    5. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
    6. Review temporary protection requirements for aluminum composite wall panel assembly during and after installation.
    7. Review wall panel observation and repair procedures after aluminum wall panel installation.

2. Meeting Time: Minimum 3 weeks prior to commencement of work covered by this Section and any related work affecting work covered by this Section.
3. Meeting Location: Project Site.

#### **1.4 DESIGN REQUIREMENTS**

6. Components: Designed and manufactured to withstand dead and live loads caused by positive and negative wind pressure acting normally to plane of composite wall panels in accordance with International Building Code, Chapter 16.
7. Wall Panel Deflection:  $L/180$ .
8. Perimeter Framing Deflection:  $L/180$ .
9. Thermal Movement: Design system to accommodate vertical and horizontal thermal movement of components without causing distortion, excessive stress on fasteners, or oil canning when subjected to recurring temperature variations.
10. Drainage: Design for positive drainage of water leakage and condensation to exterior of wall panel system.
11. Tolerance of Substructure: Design system to accommodate up to  $\frac{1}{4}$  inch in 10 feet variation out of plane.
12. Seismic Design: Conform to International Building Code for the Seismic Category appropriate for location of system installation.

#### **1.5 PERFORMANCE REQUIREMENTS**

13. Provide the following testing documentation: Testing documentation must be current and meet or exceed specified design and performance requirements, and must be documented and certified by an independent testing agency acceptable to Architect and applicable building code jurisdiction.
14. Preload at +12.5 pounds per square foot.
15. Air Infiltration in accordance with ASTM E 283 (at 1.57 pounds per square foot): 0.117 cubic feet per minute per square foot.
16. Water Penetration in accordance with ASTM E 331 (at 6.24 pounds per square foot): Approximately 0.3 square feet.
17. Static Pressure Air Infiltration (at 6.24 pounds per square foot): Less than 0.01 cubic feet per minute per square foot.
18. Static Pressure Water Resistance (at 15 pounds per square foot): No uncontrolled leakage.
19. Uniform Load Deflection:
  1. At +25.0 pounds per square foot design load: No damage.

2. At -25.0 pounds per square foot design load: No damage.

## **1.6 SUBMITTALS**

20. Product Test Reports: Indicate compliance of products with requirements from qualified, independent testing agency.

21. Shop Drawings:

1. Provide detail drawings prepared by manufacturer or manufacturer's authorized agent showing openings and penetrations.
2. Include details of each condition of installation and attachment.
3. Provide details at a minimum scale of 1 ½ inch per foot of all required trim needed for complete installation.
4. Provide shop drawings reflecting deviations from manufacturer's standard details and details differing from Contract Documents.
5. Include components, metal panel profile(s), dimensions, joinery dimensions, configurations, and reason for deviation.

22. Product Data:

1. Manufacturer's technical data, installation instructions, standard detail drawings specific to this project, and accessories showing conformance with specified requirements.
2. Fasteners including clips, fastener types, and locations.
3. Treatment at edges, terminations, and flashings.
4. Indicate provisions for thermal expansion and contraction.

23. Product Samples: 2 inch x 3 inch showing specified finish for each specified wall.

24. Manufacturer's Instructions: Indicate installation requirements, rough-in dimensions, special procedures, and conditions requiring special attention.

25. Sample Warranty: Meet or exceed provisions specified by this Section.

## **1.7 QUALITY ASSURANCE**

26. Manufacturer Qualifications:

1. Minimum of 10 years' experience in fabricating and supplying metal wall panel systems.
2. Responsible for technical design support as required for system conforming to panel manufacturer's warranty provisions.

3. Provide review and approval of shop drawings differing from panel manufacturer's standard details prior to installation and conduct interim inspections during construction.

**27. Installer Qualifications:**

1. Able to document a minimum 7 years' experience installing commercial metal wall panel systems.
2. Trained and authorized by metal wall panel manufacturer prior to Bid Date.
3. Employ job-site foreman, with minimum of 3 years' experience supervising installation of metal wall panel work of this Section, dedicated to Work of this Contract.
4. Foreman: Continuously on site for duration of work of this Section for this Project.

**28. Single Source Responsibility:**

1. Provide system and components for this Section under responsibility of a single metal wall panel manufacturer.
2. Perform metal panel and related flashing and sheet metal work by or under supervision of single installer.

**1.8 WARRANTY**

29. Manufacturer Coating Performance Warranty: 20-year warranty against fading, color change, chalking, peeling, cracking, or delaminating of the coating system.
30. Contractor: 5-year labor warranty for panel installation, including, flashings, sealants, fasteners, and accessories to remain watertight and weatherproof.

**1.9 DELIVERY, STORAGE, AND HANDLING**

31. Deliver components, sheets, aluminum wall panels, and other manufactured items to prevent damage or deformity.
32. Package aluminum wall panels for protection during transportation and handling.
33. Unload, store, and erect aluminum wall panels in a manner to prevent bending, warping, twisting, and surface damage.
34. Store aluminum wall panels vertically, covered with suitable weather tight and ventilated covering.
35. Store aluminum wall panels to ensure dryness, with positive slope for drainage of water.
36. Do not store aluminum wall panels in contact with other materials that may cause staining, denting, or other surface damage.

37. Do not allow storage space to exceed 120 degrees Fahrenheit.

- **PART 2 PRODUCTS**

- **2.1 SYSTEMS**

1. Composite Wall Panels: Install concealed clips and/or fasteners over substrate system.

- 2.2 MANUFACTURERS**

2. Subject to compliance with requirements, provide products manufactured by NorthClad Rainscreen Solutions, 11831 Beverly Park Road, Building C, Everett, Washington 98204, telephone 425-740-3702, website: [www.northclad.com](http://www.northclad.com).

1. NorthClad ACM:

1. Panel Skin Material: Select one, subject to compliance with requirements: Alpolic, Alcotex, Reynobond, or approved equal.

2. Panel Material Thickness: 4 millimeters.

3. Or Owner Approved Equal

- 2.3 COMPOSITE PANEL MATERIALS**

3. Composition:

1. Aluminum composite material comprised of a thermoplastic core sandwiched between two aluminum sheets formed in a continuous process with no applied glues or adhesives.

4. Tolerances:

1. Panel bow not to exceed  $L/175$  of panel overall dimension in width or length.
  2. Panel dimensions allow for field adjustment and thermal movement.
  3. Panel lines will be sharp, smooth, and free from warps or buckles.

5. Condition: Panel surfaces will be free of scratches and marks caused during fabrication.

6. Uniformity:

1. Manufacture entire project from single color coil paint run to ensure color uniformity.
  2. If metallic color is used, panel grain must be maintained.
  3. Under no circumstances are panel blank sizes to be rotated even if the result is increased waste.

7. Vapor Management: Fabricate panels for control of condensation and ventilation of the rainscreen cavity.
8. Custom Fabrications: Include fabrications, whether specifically indicated or not, to complete watertight and finished system.
9. Expansion/Contraction: Engineer panels to permit required expansion and contraction using concealed anchors.
10. Strippable Protective Film: Factory applied for protection of weather face finish and removed upon completion of the panel installation. Failure to remove the film may lead to over-exposure and damage to the panel.

## **2.4 FASTENERS**

11. Supply Fasteners and clips tested to meet provisions of this section, as approved by fastener manufacturer and engineer of record.
12. Concealed Sheet Metal Fasteners: Panhead, self-drilling, self-tapping, non-corrosive fasteners, and as instructed by manufacturer and engineer of record.
13. Fastener Lengths: Penetrate into cold formed metal framing and subgirts, and other metal framing systems per fastener manufacturer's recommendations.

## **2.5 SYSTEM COMPONENTS**

14. Subgirts:
  1. Provide G90 galvanized steel of gauge and spacing required for metal wall panel system structural requirements and as recommended by the panel manufacturer and engineer of record in accordance with approved shop drawings.
  2. To avoid galvanic reaction, separate dissimilar materials.

## **2.6 FLASHINGS**

15. Metal Flashing, Fascias, and Trim:
  1. 0.032 inch minimum thickness.
  2. Material, color, and finish to match wall panels.
16. Panel and Flashing Closures: Waterproof, semi-rigid, polyethylene closed cell foam, or solid rubber in size and shape to snugly fit panel configuration.
17. Cutting and Fitting:
  1. Make all cuts neat, square, and true.
  2. Saw-cut or rout panels, de-burr edges, and clean filings from adjacent surfaces.

## **2.7 SEALANTS**

18. Multicomponent Nonsag Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:
  1. Products Available products include the following
    1. A. Dymeric 511, Tremo
    2. Vulkem 922 Mameco International
    3. Dynatrol II; Pecora Corporatiion
    4. Sikaflex – 2 c NS: Sika Corporation
  2. Types and Grade: M (multicomponent) and NS (nonsag).
  3. Class: 25
  4. Additional Movement Capability: 50 percent movement in extension and 50% in compression for a total of 100 percent movement.
  5. Use Related to Exposure: NT (nontraffic)
  6. Color: to match existing panel

## **2.8 FINISH**

19. Panel Finishes:
  1. Utilize coating with a fluoropolymer coating with 70% Kynar® 500 resins.
  2. Color: Dark Bronze to match dark bronze anodized storefront system
20. Pencil Hardness – ASTM D3352-74: Use an Eagle Turquoise HB-H pencil as a minimum.
21. Impact Adhesion – ASTM D294-84: No cracking or loss of adhesion in coating.
22. Cure Test – NCCA 11-18: Withstand 50+ double rubs of MEK.
23. Humidity Resistance ASTM D2247-85: No blisters after 3,000 hours of 100% humidity at 95 degrees Fahrenheit.
24. Weatherometer Test – ASTM D882-86/G23-88: No cracking, peeling, blistering, or loss of adhesion after 2,000 hours in coating.
25. Abrasion Resistance – ASTM D968-81: Resist 65+/-15 liters/mil minimum of falling sand on coating.
26. Color: Select from the full range of manufacturers' standard colors.

## **• • PART 3 EXECUTION**

### **○ 3.1 EXAMINATION**

1. Verify installation conditions satisfactory to receive work of this Section before beginning.



2. Verify substrate installation complete, flat, and true to plane.

### **3.2 PREPARATION**

3. Field Measurements: Verify prior to fabrication of metal panels and flashings.
4. Electrolytic Protection: Treat contacting surfaces of dissimilar metal of different galvanic range with non-absorptive tape, gaskets, or as instructed by manufacturer.
5. Protect surrounding areas and surfaces to preclude damage during work of this Section.
6. Lay out work before beginning installation as necessary for true, plumb, and aligned panel installations. Verify locations of joints and panel lengths.

### **3.3 INSTALLATION**

7. Conform to manufacturer's instructions and provisions of Contract Documents.
8. Install to allow thermal movement of metal panels.

### **3.4 SUBGIRTS AND FASTENERS**

9. Space, locate, align, and fasten subgirt hat channel framing over gypsum sheathing after application of air barrier.
10. Install fasteners in lengths and locations required in order to penetrate hat channels and structural metal wall framing in accordance with fastener manufacturers' instructions.
11. Torque screws as necessary for a snug fit. Do not over-torque; prevent 'oil canning' of panels.

### **3.5 METAL WALL PANELS**

12. Lock panels in place to engage interlocking seams.
13. Do not stretch or compress interlocks.
14. Secure panels in place with panels aligned and without warp or deflection.
15. Make cutting and fitting neat, square, and true. Where required saw cut, de-burr edges, and clean filings from adjacent surfaces. No torch cutting permitted.

### **3.6 PANEL GIRTS AND FASTENERS**

16. Space, locate, and align for even distribution of exposed fasteners, as instructed by manufacturer and engineer of record.
17. Install fasteners in lengths and locations required to penetrate per fastener manufacturers' instructions.

18. Torque screws as necessary for snug fit. Do not over-torque; prevent damage to panels.

### **3.7 FLASHINGS**

19. Install flashings as part of manufactured system as necessary to seal and close ends and to restrict water penetration behind wall panels.
20. Thermal Movement: Install flashing systems to allow unrestricted thermal movement of metal panels over attachment clips.
21. Penetrations: Make cutouts and edge clearances of sufficient size and shape to allow unrestrained thermal movement and to prevent contact of metal panels with penetrations.
22. Metal Flashing: Make overlaps minimum 4 inches/
23. Cutting and Fitting: Make neat, square, and true. Saw-cut panels or rout, de-burr edges, and clean filings from adjacent surfaces.

### **3.8 FIELD QUALITY CONTROL**

24. Manufacturer's Field Services:
  1. Water test weather resistive barrier prior to installation of cladding.

### **3.9 ADJUSTING**

25. Correct identified defects and irregularities.
26. Replace damaged, soiled, or discolored work.

### **3.10 CLEANING**

27. Leave installation clean and free from residue and debris from work of this Section.

### **3.11 PROTECTION**

28. Take measures to protect metal panel installations from construction activities for duration of Project. Do not permit activities that may result in gouging, scratching, or denting metal panels and flashing.

**END OF SECTION 07424**

## **SECTION 07545 – TPO ROOFING**

### **PART 1 GENERAL**

#### **1.01 DESCRIPTION**

- A. The project consists of installing Carlisle SynTec's Sure-Weld (TPO) Adhered Roofing System as outlined below:

Apply the Sure-Weld Adhered Roofing System in conjunction with polyiso rigid insulation board over the new plywood roof deck.

#### **1.02 EXTENT OF WORK**

- A. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of the Sure-Weld reinforced TPO (Thermoplastic Polyolefin) Adhered Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
- B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
- C. The roofing contractor shall confirm all given information and advise the building owner, prior to bid, of any conflicts that will affect their cost proposal.
- D. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturer must submit for pre-qualification in writing fourteen (14) days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

#### **1.03 SUBMITTALS**

- A. Prior to starting work, the roofing contractor must submit the following:
1. Shop drawings showing layout, details of construction and identification of materials.
  2. A sample of the manufacturer's Membrane System Warranty.
  3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
  4. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal 15 mil or thicker.
  5. Certification of the manufacturer's warranty reserve.
- B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

#### **1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the

- manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- B. Comply with the manufacturer's written instructions for proper material storage.
    - 1. Store Sure-Weld membrane in the original undisturbed plastic wrap in a cool, shaded area. Sure-Weld membrane that has been exposed to the elements for approximately 7 days must be prepared with Carlisle Weathered Membrane Cleaner prior to hot air welding.
    - 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
    - 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
  - C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.
  - D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

## **1.05 WORK SEQUENCE**

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- B. Do not disrupt activities in occupied spaces.

## **1.06 USE OF THE PREMISES**

- A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:
  - 1. Areas permitted for personnel parking.
  - 2. Access to the site.
  - 3. Areas permitted for storage of materials and debris.
  - 4. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.
- B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

## **1.07 EXISTING CONDITIONS**

If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

## **1.08 SAFETY**

The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. **Safety shall be the responsibility of the**

**roofing contractor.** All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

### **1.09 WORKMANSHIP**

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

### **1.10 QUALITY ASSURANCE**

- A. The Sure-Weld Membrane Roofing System must achieve a UL Class C.
- B. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to American Society of Civil Engineers (ASCE 7) / International Building Code (IBC) 2021.
- C. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made by others are not acceptable.
- D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
- F. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- G. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.
- H. The Sure-Weld TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance. When tested in accordance with ASTM C1549, the Sure-Weld White material has an initial solar reflectance of 0.79 and a 3-year aged reflectance of 0.70. The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of 0.90 and a 3-year aged emittance of 0.86 were achieved.
- I. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

### **1.11 JOB CONDITIONS, CAUTIONS AND WARNINGS**

Refer to Carlisle's Sure-Weld Roofing System specification for General Job Site Considerations.

- A. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.
- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- C. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- D. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weather tight at the end of the work day.
- I. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

## **1.12 WARRANTY**

- A. Provide manufacturer's 20 year. Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 90 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- B. Pro-rated System Warranties shall not be accepted.
- C. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

## **1.13 QUALITY ASSURANCE**

- A. The Sure-Weld Membrane Roofing System must achieve a UL Class C.
- B. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to  
  
ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies"  
International Building Code (IBC 2021)  
DORA (Directory of Roof Assemblies)
- C. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made

- by others are not acceptable.
- D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
  - E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
  - F. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
  - G. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.
  - H. The Sure-Weld TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance. When tested in accordance with ASTM C1549, the Sure-Weld White material has an initial solar reflectance of 0.79 and a 3-year aged reflectance of 0.70. The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of 0.90 and a 3-year aged emittance of 0.86 were achieved.
  - I. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. All components of the specified roofing system shall be products of Carlisle SynTec or accepted by Carlisle SynTec as compatible.
- B. All products (including insulation, fasteners, fastening plates, prefabricated accessories and edgings) must be **manufactured and/or supplied** by the roofing system manufacturer and covered by the warranty.

### **2.02 MEMBRANE**

Furnish Sure-Weld SAT 60-mil thick white, reinforced TPO (Thermoplastic Polyolefin) membrane as needed to complete the roofing system. Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal 15 mil thick or greater. Membrane sheets in rolls 10' wide by 100' long.

### **2.03 INSULATION/UNDERLAYMENT**

- A. When applicable, insulation shall be installed in multiple layers. The first and second layers of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.

- B. Insulation shall be polyisocyanurate Rigid brand as supplied by Carlisle SynTec. Minimum R-value required is R30. Provide tapered polyisocyanurate at locations where indicated on plans.
  - 1. **Carlisle Insulbase Polyisocyanurate** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289-06, Type II, Class 1, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.

## 2.04 FASTENING COMPONENTS

### A. Fasteners, Plates and Bars

- 1. **InsulFast Fasteners:** A threaded #12 fastener with #3 phillips drive used for insulation attachment into steel or wood decks.
- 2. **Insulation Fastening Plates:** a nominal 3 inch diameter plastic or metal plate used for insulation attachment.
- 3. **Sure-Weld Pressure-Sensitive RUSS™** (Reinforced Universal Securement Strip): a 6" wide, nominal 45-mil thick reinforced TPO membrane with 3" wide Pressure Sensitive Tape laminated along one edge. The 6" wide Pressure-Sensitive RUSS is used horizontally at the base of walls, curbs, etc., in conjunction with 2" diameter Seam Fastening Plates below the TPO deck membrane for additional membrane securement.

## 2.05 ADHESIVES, CLEANERS AND SEALANTS

- A. **Sure-Weld Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding Sure-Weld membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).
- A. **CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer:** a low-VOC, methylene chloride-free adhesive that can be used for a variety of applications including: bonding Sure-Weld membrane to various surfaces, enhancing the bond between Carlisle's VapAir Seal 725TR and various substrates, priming unexposed asphalt prior to applying Flexible FAST Adhesive and for adhering Sure-Weld/Sure-Flex FleeceBACK and Sure-Weld TPO membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per #40 cylinder and 4,000-5,000 sq. ft. per #85 cylinder as a primer, in a single-sided application and 750 sq. ft. per #40 cylinder and 1,500 sq. ft. per #85 cylinder as an adhesive for vertical walls, in a double-sided application.
- B. **Cut-Edge Sealant:** A white or clear colored sealant used to seal cut edges of reinforced Sure-Weld membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8" diameter bead is applied.
- C. **Water Cut-Off Mastic:** Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).
- D. **Universal Single-Ply Sealant:** A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.
- E. **Thermoplastic One-Part Pourable Sealer:** A one-part, moisture curing, elastomeric polyether sealant used to fill TPO Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 2 TPO Molded Pourable Sealant Pockets.
- F. **Weathered Membrane Cleaner:** Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).



## **2.06 METAL EDGING AND MEMBRANE TERMINATIONS**

- A. **General:** All metal edging s shall be tested and meet ANSI/SPRI ES-1 standards and comply with International Building Code.

## **2.07 WALKWAYS**

Protective surfacing for roof traffic shall be Sure-Weld TPO Walkway Rolls installed per manufacturer's requirements or concrete pavers loose laid over an approved slip sheet (pavers not recommended for slopes greater than 2" in 12").

# **PART 3 EXECUTION**

## **3.01 GENERAL**

- A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, job site considerations and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

## **3.02 INSULATION PLACEMENT AND ATTACHMENT**

- A. Install insulation or membrane underlayment over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints horizontally and vertically if multiple layers are provided.
- B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive Carlisle Flexible FAST Adhesive or OlyBond 500 BA adhesive in accordance with the manufacturer's specifications.

## **3.03 MEMBRANE PLACEMENT AND ATTACHMENT**

- A. Position Sure-Weld membrane over the acceptable substrate. Fold membrane sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
  - 1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
  - 2. Fold back the unbonded half of the sheet and repeat the bonding procedures.
- C. Position adjoining sheets to allow a minimum overlap of 2 inches to provide a minimum 1-1/2" hot air weld.
- D. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

## **3.04 FLASHING**

- A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of prefabricated accessories

is not feasible.

- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

### **3.05 WALKWAYS**

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.
- B. Hot air weld walkway material to the membrane or install concrete pavers, loose laid over an approved protection sheet in accordance with the manufacturer's specifications.

### **3.06 DAILY SEAL**

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

### **3.07 CLEAN UP**

- A. Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

**END OF SECTION 07545**

**SECTION 07620 - SHEET METAL FLASHING AND TRIM**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes sheet metal flashing and trim in the following categories:
  - 1. Exposed trim.
  - 2. Copings.
  - 3. Metal flashing
  - 4. Scupper-through fascia with conductor head.
  - 5. Reglets and counter-flashing.
  - 6. Gutters
  - 7. Downspouts
  - 8. Color: dark bronze

**1.3 PERFORMANCE REQUIREMENTS**

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

**1.4 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.
- C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.
- D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.
- E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

**1.6 PROJECT CONDITIONS**

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation, Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

**PART 2 - PRODUCTS**

**2.1 METALS**

- A. Coil-Coated Galvanized Steel Sheet: Zinc-coated, commercial-quality steel sheet conforming to ASTM A 755, G 90 (ASTM A 755M, Z 275) coating designation, coil coated with high-performance fluoropolymer coating as specified in "Coil-Coated Galvanized Steel Sheet Finish" Article; not less than 0.0336-inch (0.85-mm) thick, unless otherwise indicated.

**2.2 CONCEALED THROUGH-WALL SHEET METAL FLASHING**

- A. Fabricate through-wall metal flashings embedded in masonry a follows:
  - 1. With ribs formed in dovetail pattern at 3-inch (75-mm) intervals along length of flashing to provide a 3-way integral mortar bond and weep-hole drainage.

**2.3 REGLETS AND COUNTERFLASHING**

- A. General: Of type, metal and profile indicated, compatible with flashing. Form to securely interlock with counter-flashing.
- B. Surface-Mounted Type: With slotted holes for fastening to substrate, neoprene or other suitable weatherproofing washers, and channel for sealant at top edge.
- C. Concrete Type: With temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
- D. Masonry Type: With offset top flange for embedment in masonry mortar joint.
- E. Flexible Flashing Retainer: With resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counter-flashing or where Drawings show reglet without metal counter-flashing.
- F. Counter-flashing Wind-Restraint Clips: For installation before counter-flashing to prevent wind uplift of counter-flashing's lower edge.

- G. Counter-flashing: Fabricated from same metal as reglets and compatible with reglet system installed.

## **2.4 MISCELLANEOUS MATERIALS AND ACCESSORIES**

- A. Solder: ASTM B 32, Grade Sn50, used with rosin flux.
- B. Fasteners: Same metal as sheet metal flashing or other non-corrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- C. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.
- D. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.
- E. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants".
- F. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- G. Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.
- H. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15 -mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.
- I. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; non-corrosive; size and thickness required for performance.

## **2.5 FABRICATION, GENERAL**

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
- C. Seams: Fabricate non-moving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- D. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance one installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

- E. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24-inches (610-mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1-inch (25-mm) deep, filled with mastic sealant (concealed within joints).
- F. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- G. Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, non-corrosive metal recommended by sheet metal manufacturer.
  - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

## **2.6 SHEET METAL FABRICATIONS**

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- B. Exposed Trim: Fabricate from the following material:
  - 1. Coil-Coated Galvanized Steel: 0.0276-inch (0.7-mm) thick.
- C. Copings and Cap Flashing: Fabricate from the following material:
  - 1. Coil-Coated Galvanized Steel: 0.0396-inch (1.0-mm) thick.

## **2.7 COIL-COATED GALVANIZED STEEL SHEET FINISH**

- A. High-Performance Organic Coating Finish: Apply the following system by coil-coating process on galvanized steel sheet as recommended by coating manufacturers and applicator.
  - 1. Fluoropolymer, 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
    - a. Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.
    - b. Resin Manufacturers: Subject to compliance with requirement, provide fluoropolymer coating systems containing resins produced by one of the following manufacturers:
      - 1) Elf Atochem North America, Inc. (Kynar 500).

2. Coil-Coated Steel Sheet Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - a. Atas Aluminum Corporation.
  - b. Copper Sales, inc.
  - c. MM System Corporation.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant concealed within joints.
- D. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tem edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pre-temmed surface would show in finished Work.
  1. Do not solder the following metals.
    - a. Coil-coated galvanized steel sheet.
  2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

- E. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
  - 1. Use joint adhesive for non-moving joints specified not to be soldered.
- F. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. Trim edges to be seamed, form seams, and solder.
- G. Separations: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

**3.3 CLEANING AND PROTECTION**

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
- B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

**END OF SECTION 07620**



## **SECTION 07720 - ROOF ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Roof hatches.

### **PART 2 - PRODUCTS**

#### **2.1 ROOF HATCHES**

- A. Roof Hatches: 'Bilco' Steel Roof Hatch 36" x 36". (Type E-50-TB).
  - 1. Hardware: All hardware shall be zinc plated and chromate sealed. Steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
  - 2. Ladder-Up Post: (LU-1) Steel post to lock in place on full extension. Provide release mechanism to return post to closed position. Color: Yellow powder coat.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof accessories to fit substrates and to result in watertight performance.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Underlayment: Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
  - 2. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.
- D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
- E. Seal joints with **elastomeric** sealant as required by manufacturer of roof accessories.

**END OF SECTION 07720**

## **SECTION 07920 - JOINT SEALANTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This section includes sealants for the following applications, including those specified by reference to this Section:
  - 1. Exterior joints in the following vertical surfaces and nontraffic surfaces:
    - a. Control and expansion joints in cast-in-place concrete.
    - b. Control and expansion joints in unit masonry.
    - c. Joints between different materials listed above.
    - d. Perimeter joints between materials listed above and frames of doors and windows.
    - e. Other joints as indicated.
  - 2. Exterior joints in the following horizontal traffic surfaces:
    - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    - b. Joints between different materials listed above.
    - c. Other joints as indicated.
  - 3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Tile control and expansion joints.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
    - e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - f. Other joints as indicated.
    - g. PROVIDE CLEAR SEALANT
  - 4. Interior joints in the following horizontal traffic surfaces:
    - a. Control and expansion joints in cast-in-place concrete slabs.
    - b. Control and expansion joints in tile flooring.
    - c. Other joints as indicated.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. Provide joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

**1.4 SUBMITTALS**

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant thorough one source form a single manufacturer.
- C. Pre-construction Compatibility and Adhesion Testing: Receive from joint sealant manufacturers, data assuring compatibility with and adhesion to materials that will contract or affect joint sealants.

**1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot-life, curing time, and mixing instructions, for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminates, or other causes.

**1.7 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
  - 2. When joint substrates are wet.
- B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

**1.8 WARRANTY**

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in

addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: One year from date of Substantial Completion.
- C. Special Manufacturer's Warranty: Written warranty, signed by manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: One year from date of Substantial Completion.
- D. Special warranties specified in this Article exclude deterioration or failure of joint sealants from the following:
  - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
  - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCTS AND MANUFACTURERS**

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed herein.

### **2.2 MATERIALS, GENERAL**

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### **2.3 JOINT SEALANTS**

- A. Thiokol Sealant (nonsag).
  - 1. Polysulfide rubber, two-component, Fed Spec TT-S-00227E, Type II, Class A; Pecora "GC-5 Synthacalk" or acceptable equal.
- B. Urethane Sealant (nonsag).
  - 1. Gun grade.

- C. Multi-Component
  - 1. Two-or three-component, modified polyurethane, Fed Spec TT-S-00227E, Type II, Class A; Pecora "Dynatrol II," Sonneborn "Sonolastic NP-II," or Tremco "Dymeric."
- D. Single Component
  - 1. Fed Spec TT-S-00230C, Type II, Class A; Pecora, "Dynatrol I," Sonneborn "Sonolastic NP-I," or Tremco "Dymonic."
- E. Urethane Sealant
  - 1. Two-component, Fed Spec TT-S-00227E, Type I, Class A; Pecora "NR-200 Urexpan" or Tremco "THC-900."
- F. Acrylic Sealant
  - 1. Nonsag, solvent release type, Fed Spec TT-S-00230: Pecora "Unicrylic 60 Plus" or Tremco "Mono."
- G. Silicone Sealant
  - 1. Dow Corning "786 Mildew Resistant Silicone Sealant" or General Electric "Silicone 1700 Sanitary Sealant."

## **2.4 JOINT-SEALANT BACKING**

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, of type, size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Locations to be caulked or sealed:
  - 1. With Thiokol (nonsag) or Urethane Sealant (nonsag).
    - a. Entire perimeter of frames for exterior metal doors, both sides.
    - b. Entire perimeter of windows, both sides.
    - c. Control joints in masonry and EIFS walls.
    - d. Perimeter of door and window units, both sides.
    - e. Watertight joints in sheet metal work, unless otherwise indicated.
    - f. Joints between masonry and cast-in-place concrete.
    - g. Any other locations where caulking is indicated on the drawings, specified in other sections, ore required for weatherproofing.
  - 2. With Urethane Sealant (self-leveling).
    - a. Horizontal Joints in concrete walks.
  - 3. With Acrylic Sealant.
    - a. Entire perimeter of frames for interior metal doors and windows, both sides.
    - b. Other interior locations where caulking is indicated on the drawings or specified in other sections.
  - 4. With silicone Sealant.
    - a. Around floor sinks.

## **2.5 MISCELLANEOUS MATERIALS**

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from pre-construction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
    - a. Metal.
    - b. Glass.
    - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on pre-construction joint-sealant-substrate test or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that other wise would be permanently stained or damaged by such contact or by

cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.3 INSTALLATION OF JOINT SEALANTS**

- A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
    - a. Entire perimeter of frames for interior metal doors and windows, both sides.
- D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
  - 4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
  - 5. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
    - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- F. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
  - 1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
  - 2. Apply a bead of silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's printed schedule and covering a bonded area of not less than a 3/8-inch (10-mm). Hold edge of sealant bead inside of masking tape by 1/4-inch (6-mm).

3. Within 10-minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of horizontal joints before installing vertical joints. Lap vertical joints over horizontal joints. At end of joints, cut silicone extrusion with a razor knife.

### **3.4 FIELD QUALITY CONTROL**

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates.

### **3.5 CLEANING**

- A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### **3.6 PROTECTION**

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deterioration joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

**END OF SECTION 07920**



**SECTION 08113 - HOLLOW METAL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Standard hollow metal doors and frames.

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required.
- E. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Amweld Building Products, LLC.
  - 2. Benchmark; a division of Therma-Tru Corporation.
  - 3. Ceco Door Products; an Assa Abloy Group company.
  - 4. Curries Company; an Assa Abloy Group company.
  - 5. Deansteel Manufacturing Company, Inc.
  - 6. Firedoor Corporation.
  - 7. Fleming Door Products Ltd.; an Assa Abloy Group company.
  - 8. Habersham Metal Products Company.
  - 9. Kewanee Corporation (The).
  - 10. Mesker Door Inc.
  - 11. Pioneer Industries, Inc.
  - 12. Security Metal Products Corp.
  - 13. Steelcraft; an Ingersoll-Rand company.
  - 14. Windsor Republic Doors.

## **2.2 MATERIALS**

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS, Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF120) metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
  - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I.
- H. Glazing: Division 08 Section "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

## **2.3 STANDARD HOLLOW METAL DOORS**

- A. General: Comply with ANSI/SDI A250.8.
  - 1. Design: Flush panel
  - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core.
    - a. Thermal-Rated (Insulated) Doors: U value not less than (.61) when tested according to ASTM C 1363.
  - 3. Vertical Edges for Single-Acting Doors: Manufacturer's standard.
  - 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- (1.0-mm-) thick, end closures or channels of same material as face sheets.
  - 5. Tolerances: SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Comply with ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
  - 1. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).
- C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Level 1 and Physical Performance Level C (Standard Duty), Model 1 (Full Flush).
  - a. Width: 1-3/4 inches (44.5 mm).
- D. Hardware Reinforcement: ANSI/SDI A250.6.

## **2.4 STANDARD HOLLOW METAL FRAMES**

- A. General: Comply with ANSI/SDI A250.8.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
  1. Fabricate frames with mitered or coped corners.
  2. Fabricate frames as welded.
  3. Frames for Level 3 Steel Doors: 0.053-inch- (1.3-mm-) thick steel sheet.
  - 4.
- C. Interior Frames: Fabricated from cold-rolled steel sheet.
  1. Fabricate frames with mitered or coped corners.
  2. Fabricate frames as knocked down unless otherwise indicated.
  3. Fabricate knocked-down, drywall slip-on frames for in-place gypsum board partitions.
  4. Frames for Level 1 Steel Doors: 0.042-inch- (1.0-mm-) thick steel sheet.
- D. Hardware Reinforcement: ANSI/SDI A250.6.

## **2.5 FRAME ANCHORS**

- A. Jamb Anchors:
  1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
  2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
  3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

## **2.6 HOLLOW METAL PANELS**

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

## **2.7 STOPS AND MOLDINGS**

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch (0.8 mm) thick, same material as door face sheet.

- B. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch (0.8 mm) thick, same material as frames.
- C. Terminated Stops: Where indicated, terminate stops 6 inches (152 mm) above finish floor with a 45 degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.

## **2.8 FABRICATION**

- A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- B. Hollow Metal Doors:
  - 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors. Seal joints in top edges of doors against water penetration.
  - 2. Glazed Lites: Factory cut openings in doors.
  - 3. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow Metal Frames: Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 3. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
    - b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
  - 4. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers.
    - a. Single-Door Frames: Three door silencers.
    - b. Double-Door Frames: Two door silencers.
- D. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
  - 1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.
  3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
  4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 electrical Sections.
- E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
  2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  3. Provide loose stops and moldings on inside of hollow metal work.
  4. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

## **2.9 STEEL FINISHES**

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
1. Shop Primer: ANSI/SDI A250.10.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Hollow Metal Frames: Comply with ANSI/SDI A250.11.
1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-protection-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - c. Install frames with removable glazing stops located on secure side of opening.
    - d. Install door silencers in frames before grouting.
    - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
  5. Concrete Walls: Solidly fill space between frames and concrete with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
  6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  7. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
  9. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus **1/16 inch (1.6 mm)**, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus **1/16 inch (1.6 mm)**, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus **1/16 inch (1.6 mm)**, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus **1/16 inch (1.6 mm)**, measured at jambs at floor.
- B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
- C. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.

### **3.2 ADJUSTING AND CLEANING**

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

**END OF SECTION 08113**

## **SECTION 08212 - STILE AND RAIL WOOD DOORS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes interior stile and rail wood doors.
- B. See Division 6 Section "Interior Architectural Woodwork" for wood door frames.

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of door indicated.
- B. Shop Drawings: Indicate location, size, and hand of each door; construction details for stiles, rails, panels, and moldings, (sticking); mortises, holes and cutouts; elevation of each kind of door; construction details not covered in Product Data; and other pertinent data.
- C. Samples: Corner section, 12-inches by 12-inches showing edges, faces, joinery and material qualities of typical stile, rail, molding and panel for each for each door type and finish required.

#### **1.3 QUALITY ASSURANCE**

- A. Quality Standard for Doors of Stock Design and Construction: Comply with WDMA I.S.6, "Industry Standard for Wood Stile and Rail Doors."
- B. Quality Standard for Doors of Special Design and Construction: Comply with AWI's "Architectural Woodwork Quality Standards."
- C. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless those of Category I are expressly indicated and permitted.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

#### **2.2 MATERIALS**



- A. Assemble exterior doors and sidelites, including components, with wet-use adhesives.

## **2.3 STILE AND RAIL DOORS OF STOCK DESIGN AND CONSTRUCTION**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eggers Industries; Architectural Door Division.
  - 2. JELD-WEN, Inc.
  - 3. Maywood, Inc.
  - 4. McPhillips Manufacturing.
  - 5. Simpson Door Company.
  - 6. Request approval for Substitutions
  - .
- B. Interior Doors:
  - 1. Grade for Transparent Finish: Premium.
  - 2. Grade for Opaque Finish: Custom.
  - 3. Wood Species for Transparent Finish: Douglas Fir, Vertical grain
  - 4. Wood Species for Opaque Finish: Manufacturer's standard softwood species and cut for stiles and rails; with panels of same species or wood-base construction materials.
  - 5. Raised-Panel Thickness: Manufacturer's standard, but not less than **3/4 inch (19 mm)**.
  - 6. Re: Architectural Drawings for Elevations and Section.
  - 7. Architectural glass = 1/4" tempered (owner to provide etchings for men's and women's.)

## **2.4 FABRICATION**

- A. Fabricate stile and rail wood doors in sizes indicated for Project-site fitting.
- B. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting.
- C. Factory machine doors for hardware that is not surface applied.
- D. Glazed Openings: Glaze doors at factory with glass of type and thickness indicated, complying with Division 8 Section "Glazing."
- E. Exterior Doors: Factory treat exterior doors after fabrication with water-repellent preservative to comply with WDMA I.S.4. Flash top of out-swinging doors with manufacturer's standard metal flashing.

## **2.5 SHOP PRIMING**

- A. Doors for Opaque Finish: Shop apply one coat of wood primer specified in Division 9 Section "Painting" to faces and edges of doors.
- B. Doors for Transparent Finish: Shop apply stain, other required pretreatments, and first coat of finish specified in Division 9 Section "Painting" to faces and edges of doors.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Install wood doors to comply with manufacturer's written instructions and with referenced quality standard, and as indicated.
- B. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
  - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

**END OF SECTION 08212**

**SECTION 08255 - FRP FLUSH DOORS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Fiberglass reinforced polyester (FRP) flush doors with aluminum frames.

**1.2 RELATED SECTIONS**

- A. Section 08711 - Door Hardware.

**1.3 REFERENCES**

- A. AAMA 1503-98 - Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- B. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
- C. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
- D. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- E. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- F. ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- G. ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.
- H. ASTM D 570 - Water Absorption of Plastics.
- I. ASTM D 638 - Tensile Properties of Plastics.
- J. ASTM D 790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- K. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
- L. ASTM D 1621 - Compressive Properties of Rigid Cellular Plastics.
- M. ASTM D 1623 - Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- N. ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- O. ASTM D 2583 - Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

- P. ASTM D 5420 – Impact Resistance of Flat Rigid Plastic Specimens by Means of a Falling Weight.
- Q. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
- R. ASTM E 84 - Surface Burning Characteristics of Building Materials.
- S. ASTM E 90 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- T. ASTM E 283 - Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- U. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- V. ASTM E 331 - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- W. ASTM F 476 - Security of Swinging Door Assemblies.
- X. ASTM F 1642-04 – Standard Test Method for Glazing Systems Subject to Air blast Loading.
- Y. NWWDA T.M. 7-90 – Cycle Slam Test Method
- Z. SFBC PA 201 - Impact Test Procedures.
- AA. SFBC PA 203 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- AB. SFBC 3603.2 (b)(5) - Forced Entry Resistance Test.

#### **1.4 PERFORMANCE REQUIREMENTS**

- A. General: Provide door assemblies that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
- B. Air Infiltration: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 283 at pressure differential of 6.24 psf. Door shall not exceed 0.90 cfm per linear foot of perimeter crack.
- C. Water Resistance: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 331 at pressure differential of 7.50 psf. Door shall not have water leakage.
- D. Indoor air quality testing per ASTM D 6670-01: GREENGUARD Environmental Institute Certified including GREENGUARD for Children and Schools Certification.
- E. **IECC 2012 Requirements: To meet or exceed the R-Value and SHGC value for Lee's Summit, MO. Confirm / Refer to IECC Envelope Compliance Certificate.**

- F. Blast Test, Doors and Frames, ASTM F 1642-04, 6 psi / 41 psi-msec: Minimal Hazard.
- G. Swinging Door Cycle Test, Doors and Frames, ANSI A250.4: Minimum of 25,000,000 cycles.
- H. Cycle Slam Test Method, NWWDA T.M. 7-90: Minimum 5,000,000 Cycles.
- I. Swinging Security Door Assembly, Doors and Frames, ASTM F 476: Grade 40.
- J. Salt Spray, Exterior Doors and Frames, ASTM B 117: Minimum of 500 hours.
- K. Sound Transmission, Exterior Doors, STC, ASTM E 90: Minimum of 25.
- L. Thermal Transmission, Exterior Doors, U-Value, AAMA 1503-98: Maximum of 0.29 BTU/hr x sf x degrees F. Minimum of 55 CRF value.
- M. Surface Burning Characteristics, FRP Doors and Panels, ASTM E 84:
  - 1. Flame Spread: Maximum of 200, Class C.
  - 2. Smoke Developed: Maximum of 450, Class C.
- N. Surface Burning Characteristics, Class A Option On Interior Faces of FRP Exterior Panels and Both Faces of FRP Interior Panels, ASTM E 84:
  - 1. Flame Spread: Maximum of 25.
  - 2. Smoke Developed: Maximum of 450.
- O. Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 256: 15.0 foot-pounds per inch of notch.
- P. Tensile Strength, FRP Doors and Panels, Nominal Value, ASTM D 638: 14,000 psi.
- Q. Flexural Strength, FRP Doors and Panels, Nominal Value, ASTM D 790: 21,000 psi.
- R. Water Absorption, FRP Doors and Panels, Nominal Value, ASTM D 570: 0.20 percent after 24 hours.
- S. Indentation Hardness, FRP Doors and Panels, Nominal Value, ASTM D 2583: 55.
- T. Gardner Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 5420: 120 in-lb.
- U. Abrasion Resistance, Face Sheet, Taber Abrasion Test, 25 Cycles at 1,000 Gram Weight with CS-17 Wheel: Maximum of 0.029 average weight loss percentage.
- V. Stain Resistance, ASTM D 1308: Face sheet unaffected after exposure to red cabbage, tea, and tomato acid. Stain removed easily with mild abrasive or FRP cleaner when exposed to crayon and crankcase oil.
- W. Chemical Resistance, ASTM D 543. Excellent rating.
  - 1. Acetic acid, Concentrated.
  - 2. Ammonium Hydroxide, Concentrated.
  - 3. Citric Acid, 10%.
  - 4. Formaldehyde.
  - 5. Hydrochloric Acid, 10%
  - 6. Sodium hypochlorite, 4 to 6 percent solution.

- X. Compressive Strength, Foam Core, Nominal Value, ASTM D 1621: 79.9 psi.
- Y. Compressive Modulus, Foam Core, Nominal Value, ASTM D 1621: 370 psi.
- Z. Tensile Adhesion, Foam Core, Nominal Value, ASTM D 1623: 45.3 psi.
- AA. Thermal and Humid Aging, Foam Core, Nominal Value, 158 Degrees F and 100 Percent Humidity for 14 Days, ASTM D 2126: Minus 5.14 percent volume change.

## **1.5 SUBMITTALS**

- A. Comply with Section 01330 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
- D. Samples:
  - 1. Color: Submit manufacturer's samples of standard colors of doors and frames.
- E. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.
- F. Warranty: Submit manufacturer's standard warranty.

## **1.6 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications:
  - 1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 25 years successful experience.
  - 2. Door and frame components from same manufacturer.
  - 3. Evidence of a compliant documented quality management system.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finish from damage during handling and installation.

## **1.8 WARRANTY**

- A. Warrant doors, frames against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, (hardware supplied by contractor) and deterioration of finish or construction in excess of normal weathering.
- B. Warranty Period: Ten years starting on date of shipment. In addition, a limited lifetime (while the door is in its specified application in its original installation) warranty covering: failure of corner joinery, core deterioration, delamination or bubbling of door skin.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURER**

- A. Special-Lite, Inc., PO Box 6, Decatur, Michigan 49045. Toll Free (800) 821-6531. Phone (269) 423-7068. Fax (800) 423-7610. Web Site [www.special-lite.com](http://www.special-lite.com). E-Mail [info@special-lite.com](mailto:info@special-lite.com).
- B. Contact: Casey Cohorst, 810 Resources, 913-609-0887, [Casey@810resource.com](mailto:Casey@810resource.com)
- C. **No Substitutions**

### **2.2 FRP FLUSH DOORS**

- A. Model: Flush Doors (unless noted otherwise) with Special Lite exterior door
- B. Model: Double Action Door
- B. Door Opening Size: (3'-6" X 7'-0") - Door **117/1, 128/1** and **130/1** (note window size and ht see A901) (SL-17)  
(3'-0" x 7'-8") – Door **104/1** (full glass- see sheet A901) SL-20
- Finish Materials: Frame: **117/1, 128/1 130/1, 104/1**  
Frame Finish: Aluminum Anodized Dark Bronze  
Door Finish **117/1, 128/1 130/1**: Pebble Grain FRP – color: Dark Bronze  
Door Finish **104/1**: Smooth Finish – color: Dark Bronze
- D. Construction:
  - 1. Door Thickness: 1-3/4 inches.
  - 2. Stiles and Rails: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes, minimum of 2-5/16-inch depth.
  - 3. Corners: Mitered.
  - 4. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
  - 5. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery. Welds, glue, or other methods are not acceptable.
  - 6. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
  - 7. Rail caps or other face sheet capture methods are not acceptable.
  - 8. Extrude top and bottom rail legs for interlocking continuous weather bar.
  - 9. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept

pile brush weatherseals.

10. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
11. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.

**D. Face Sheet:**

1. Material: SpecLite3 FRP, 0.120-inch thickness, finish color throughout.
2. Protective coating: Abuse-resistant engineered surface. Provide FRP with SpecLite3 protective coating, or equal.
3. Texture:
  - a. **Pebble – (SL-17) Door 117/1, 128/1, 1301 - Dark Bronze.**
  - b. **Smooth (SL-20) door 104/1 – Dark Bronze**
4. Adhesion: The use of glue to bond face sheet to foam core is prohibited.

**E. Core:**

1. Material: Poured-in-place polyurethane foam.
2. Density: Minimum of 5 pounds per cubic foot.
3. R-Value: Minimum of 9.

**F. Cutouts:**

1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
2. Factory install vision lites, louvers, and panels.

**G. Hardware:**

1. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
2. **Hinge to be supplied and installed by Special Lite**

## **2.3 MATERIALS**

**A. Aluminum Members:**

1. Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes: ASTM B 221.
2. Sheet and Plate: ASTM B 209.
3. Alloy and Temper: As required by manufacturer for strength, corrosion resistance, application of required finish, and control of color.

**B. Components: Door and frame components from same manufacturer.**

**C. Fasteners:**

1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
2. Compatibility: Compatible with items to be fastened.
3. Exposed Fasteners: Screws with finish matching items to be fastened.

## **2.4 FABRICATION**

**A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on the Drawings.**

**B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop**



drawings.

- C. Assembly:
  - 1. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
  - 2. Remove burrs from cut edges.
- D. Welding: Welding of doors or frames is not acceptable.
- E. Fit:
  - 1. Maintain continuity of line and accurate relation of planes and angles.
  - 2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

## **2.6 ALUMINUM DOOR FRAMING SYSTEMS**

- A. Tubular Framing:
  - 1. Size and Type: As indicated on the Drawings. (**Note: 4" head on exterior doors**)
  - 2. Materials: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes, 1/8-inch minimum wall thickness.
  - 3. Applied Door Stops: 0.625-inch high, with screws and weatherstripping. Door stop shall incorporate pressure gasketing for weathering seal. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
  - 4. Frame Members: Box type with 4 enclosed sides. Open-back framing is not acceptable.
  - 5. Caulking: Caulk joints before assembling frame members.
  - 6. Joints:
    - a. Secure joints with fasteners.
    - b. Provide hairline butt joint appearance.
  - 7. Field Fabrication: Field fabrication of framing using stick material is not acceptable.
  - 8. Applied Stops: For side, transom, and borrowed lites and panels. Applied stops shall incorporate pressure gasketing for weathering seal. Reinforce with solid bar stock fill for frame hardware attachments.
  - 9. Hardware:
    - a. Premachine and reinforce frame members for hardware in accordance with manufacturer's standards and hardware schedule.
    - b. Factory install hardware. (Supplied by contractor)
  - 10. Anchors:
    - a. Anchors appropriate for wall conditions to anchor framing to wall materials.
    - b. Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.
    - c. Secure head and sill members of transom, side lites, and similar conditions.

## **2.7 HARDWARE**

- A. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
- B. Factory install hardware (supplied by contractor) Hardware Schedule 08711
- C. Hardware Schedule: As indicated on the Hardware Schedule Section 08711

- D. Finish: As specified on the Hardware Schedule Section 08711

## **2.8 VISION LITES**

- A. Factory Glazing: -inch glass insulating units.
- B. Lites in Exterior Doors: Allow for thermal expansion.
- C. Lites:
  - 1. Size:
    - a. (see sheet A901 – 6" x 24")– door **117/1** and **128/1**
    - b. Door **104/1**: (see sheet A901 – full height glass – tinted 1" tempered glass with mullions between glass)
  - 2. Factory glazed with screw-applied aluminum stops anodized to match perimeter door rails.

## **2.10 ALUMINUM FINISHES**

- A. Anodized Dark Bronze (exterior doors **117/1, 128/1, 130/1, 104/1**)

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

## **3.2 PREPARATION**

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

## **3.3 INSTALLATION**

- A. **Installation of doors and frames by authorized Special-Lite installer**
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- E. Set thresholds in bed of mastic and backseal.
- F. Install exterior doors to be weathertight in closed position.
- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by

Architect.

- H. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

### **3.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for installation of doors.

### **3.5 ADJUSTING**

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

### **3.6 CLEANING**

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.

### **3.7 PROTECTION**

- A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

**END OF SECTION 08255**

**SECTION 08362 – GLAZED SECTIONAL OVERHEAD DOOR - INSULATED**

**PART 1 - GENERAL**

**1.01 SUMMARY - Section Includes:**

- A. Provide Full View Glazed Aluminum Sectional Overhead Type; Glass Garage Door(s) with Insulated Frames, Insulated Glass Units (Tempered): Obscured, Transparent Clear, Tinted, or Insulated Aluminum Panels, as designed per elevation. Frame rails will consist of Extruded Aluminum alloy with either: Clear Anodizing, Powder Coating, Kynar Paint, Simulated Wood Powder Coating, or as specified by Architect (or Project Rep.), for color and type. System will also include all brackets, track system guides, counterbalance, stainless steel hinges, stainless steel rollers, stainless steel fixture hardware, electric motor or manual chain hoist, for a complete finish and operational installation.
  - 1. See 2.02 for Performance Requirements, 2.03 for Components; such as Glazing (type / color), track type, operator type, etc., and 2.04 for finish (type / color).
  - 2. Provide system to suit field conditions and openings with applicable headroom and side room.

**1.02 RELATED REQUIREMENTS**

- A. Section 06100 : Rough Carpentry and Framing. [Adhere to shop drawing min. requirements] General Contractor to provide all structural support, solid blocking, and/or anchoring points.
- B. Division 26 : Basic Materials: Empty conduit from control units to door operator. [By GC]
- C. Division 26 : Electrical service to disconnect near door operator [120-240 single phase dedicated receptacle]

**1.03 SUBMITTALS**

- A. Shop Drawings: Indicate accessories, opening dimensions and required tolerances, connection details, anchorage, spacing, hardware locations, and installation details.
- B. Product Certification: Product line information specific to the performance requirements in section 2.02, Current copy of the NFRC Product License; for verification of compliance.
- C. NFRC Certification Authorization Reports (NFRC - C.A.R.): Provide a summary of the conforming test procedures and result, which include, but are not limited to: Air Infiltration, Water Resistance, Wind Load, and Structural Testing; in accordance with ASTM E-283, ASTM E-330, ASTM E-331, ASTM E-547.
- D. Samples: Submit two frame finish samples, and two panel samples; illustrating color and finish.

- E. Manufacturer's Installation Instructions: Include any known special procedures required by project conditions; for review by the Architect and Engineer of record.
- F. Operator Manuals: Include specific model #, data for motor and transmission, gearing, lubrication frequency, maintenance, spare part sources, troubleshooting, and adjusting.
- G. Operator Station Control [Data Sheet required; if electric operators are specified]: Include specific model #, type, and information data sheet for motor control. The control station should be located and installed in close proximity to the door, motor operator (left or right side), and provide for direct line to site vision; when operating (opening / closing) the unit.
- H. Aux. Safety Components [Data Sheet; if the electric operators are specified]: Include specific model #, data sheet, maintenance, spare part sources, and manual.
- I. Warranty: Submit manufacturer warranty letter; after installation occurs. Ensure that the warranty forms have been completed in Owner's name, with jobsite address, pictures for verification that the installation occurred correctly, and is registered with manufacturer.
- J. Sustainable Design Submittals: (LEED, National Green Building Standards, Green Globes)
  - 1. Submit documentation from manufacturer of the amounts of pre-consumer and post-consumer recycled content for products specified.
  - 2. Submit documentation showing manufacturing locations and origins of materials for products manufactured and sourced within 500 miles of project location.

#### **1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing of "Full View Type - Glass Garage Doors" specified in this section, with a minimum (70) seventy years or more of documented experience. The Fenestration products must be tested "as a whole system" vs. relying on the data of (1) type of glazing panel alone. The test results must be certified by an independent third-party laboratory, adhere to a quality assurance program; which is re-certified every (4) years, and provide Current NFRC Licensing; with permanent identification plaque, and current CPD #'s (Certified Products Database #'s) for verification. See Glazing Panel Type (for specific CPD #) in section 2.03.G
- B. The Fenestration products shall be tested "as a whole system", with test results verified by a third-party laboratory.
- C. Installer Qualifications: If product installation occurs within the State of California, a Factory Direct installation is recommended. Alternatively, a Company specializing in performing the work within this section (which has a min. 5 years of experience), and has acquired a letter of authorization from the Manufacturer; will also be acceptable.
- D. Applicable Codes: Follow all Federal, State, County, and City Building codes as applicable; which include: NEC (National Electric Code) for wiring of motor and motor control requirements as appl., State Energy Code (Specific to Air Infiltration and sealing the Building Envelope); whereas the product specified in this section is tested as a "Whole System" to provide Certified results for: U-Factors, SHGC, VT, Air and Water Infiltration ratings to meet the energy calculations; required per code.

- E. Independent third-party laboratory shall have current NFRC, FL. Miami / Dade licensing.
- F. Products Requiring Electrical Connection: Listed and classified by UL (Underwriters Laboratories Inc.), as suitable for the purpose specified.
- G. Components: All components found in section 2.03 are to be provided by the door manufacturer.
- H. Single-Source Supplier: Provide Door(s), tracks, motors, and accessories from one manufacturer; to ensure that manufacturers' recommendation on various parts have been tested, and properly combined to function as described.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, and model: Ex. "Insulated Frame Line".
- B. Storage and Handling: Store materials in clean, dry, interior area in accordance with manufacturer's instructions. Protect materials from damage during handling and installation.

#### **1.06 WARRANTY**

- A. Provide Closeout Submittals for warranty requirements: Submit manufacturer warranty letter; after installation occurs. Ensure that the warranty forms have been completed in Owner's name, with jobsite address, pictures for verification that the installation occurred correctly, and is registered with manufacturer.
- B. Manufacturer shall provide high cycle life hardware; as specified on general requirements. Hardware Includes: track hardware, heavy-duty stainless steel hinges, stainless steel sealed roller, high cycle galvanized springs (as avail. by manufacturer), and high tensile aluminum alloy frame rails.

### **PART 2 - PRODUCTS**

#### **2.01 SYSTEM MANUFACTURER**

- A. A manufacturer with no less than 70 years of experience in fabricating "Fully Insulated Frame Technology" with ASTM Air & Water Certifications; per NFRC requirements, for "Full View Sectional Overhead - Glass Garage Doors"
- B. Basis of Design:

bp - Glass Garage Doors & Entry Systems, Inc.  
1511 W. 2<sup>nd</sup> St.  
Pomona, CA 91766

Factory Direct / World-Wide Shipping:  
Toll Free: (877) 442-1716  
Direct: (626) 442-1716  
Web: [www.GlassGarageDoors.com](http://www.GlassGarageDoors.com)

**Model Lines:**

bp - **Insulated Line**: Seals the Building Envelope (IECC & NFRC Compliant: HVAC

**Product Size Series:**

bp - **550 SHD** Super Heavy Duty for Doors: **108/2, 108/3, 108/4, 201/1, 201/2, 201/3 & 201/4**

- C. Contact **bp** for assistance in verifying: Model Lines, Product Sizes, Options, Glass Type, Operator Type, Width, Height, Weight, and Building Code Requirements.

1. Address: 1511 W. 2<sup>nd</sup> St., Pomona, CA 91766
2. Phone: Toll Free: (877) 442-1716, Direct: (626) 442-1716
3. Email (Request for Info): [Service@GlassGarageDoors.com](mailto:Service@GlassGarageDoors.com)
3. Website (Download Info.): [www.GlassGarageDoors.com](http://www.GlassGarageDoors.com)

**2.02 PERFORMANCE AND CERTIFICATION REQUIREMENTS:**

- A. Provide Certification Reports: Product line information must be specific to performance requirements, and must be certified per NFRC and IECC (Energy Code) Requirements for Exterior Doors & Windows. All products must comply with all the applicable requirements of this subsection; which include independent laboratory testing, certified results, and current copy of the NFRC Licensing Agreement; for verification of Compliance.
- B. NFRC [Certified Products Database] (NFRC – C.P.D.): Provide a summary the conforming test procedures and results, which include, but are not limited to: Air Infiltration, Water Resistance, Wind Load, and Structural Testing; in accordance with ASTM E-283, ASTM E-330, ASTM E-331, ASTM E-547, NFRC 100, NFRC 200, NFRC 400
- C. Entire assembly (including frame rails, glass, and panels) shall be certified by the [NFRC \(National Fenestration Rating Council\)](#); Products shall bear “**NFRC Certified labeling**”; which indicates energy performance and technical information. Certifications and Licensing agreements with the NFRC; must be current at the time of manufacturing and/or installation and shall meet or exceed 2012 – IECC (International Energy Conservation Code – 2016 to current).
- D. Authorized Certifications: No other pseudo certifications will be acceptable, other than the NFRC. Unacceptable pseudo certifications include, but are not limited to: letters from manufacturers, uncertified laboratories, website pages, or other forms of advertising, etc.
1. Fenestration U-Factors & Thermal Transmittance: Per NFRC 100 (Incl. Glazing: U-Factors) which supersedes ANSI/DASMA105
  2. Fenestration SHGC & VT: (Solar Heat Gain Coefficient & Visible Transmittance)  
Per NFRC 200
  3. Air Infiltration Certification: Per NFRC 400 (See 2.02-C below)

4. Product must be provided with temporary labels on all glazing and/or panels (for inspection purposes; with certified results) demonstrating compliance to the building inspector, and / or enforcement agency.
  5. Product must be provided with a permanent plaque riveted at the bottom interior (**NFRC Certified labeling**) for inspection by the Architect and/or Representative of record; also demonstrating compliance to the building inspector, and / or enforcement agency.
  6. Fenestration product performance must be certified in accordance with NFRC and requires supporting documentations: Product must be provided with a "**Certificate of Acceptance**" (Found at the end of this section) to be provided for the Architect of Record; during the submittal process. In addition, provide a copy for the Inspection Bureau of record, or the Dept. of Building & Safety; as applicable. This **Fenestration Certificate** will be used as a verifiable source; which traces back to the [www.NFRC.org](http://www.NFRC.org) website; for validating the manufacturer's compliance.
- C. **Air Infiltration (Certification): Required (per Building Code)**; when measured in accordance with ASTM E-283 and ANSI / DASHMA 105: Air Infiltration Test Pressure Differential: 6.24 pounds per square inch. Entire assembly: glass, panels, and Frames shall be certified by an independent Testing Lab; which indicates energy performance, wind load, cyclical testing, and technical information, when measured in accordance with NFRC 100, and NFRC 400 (As Licensed on the NFRC.org website, and traces back to the manufacturer; for validating compliance.)
1. **Fully Insulated Frames**: All hollow voids within the frame system, must be filled with a cooperative band to seal all sections, to maintain an airtight seal; for meeting the Building Energy Code Requirements.
- D. **Water Infiltration (Certification)**: System must be tested and certified to mitigate water infiltration, when measured in accordance with ASTM E 331 and ASTM E 547 water testing methods. This package also includes: [(1) each per door] a ½" high x 4"-6" deep x door width; Solid Aluminum Threshold. Designed for heavy traffic [Pedestrian or Vehicular] with ADA compliance. The Water Resistance Package must be combined with the bp – Fully Insulated Frame System; which is certified per NFRC 400. (Verify currently Licensed per the [NFRC.org](http://NFRC.org) Website, prior to ordering.) A notarized manufacturers' letter will be provided to the installer, and Architect of record, after the installation is completed. This will verify the installation was completed per the Factory Specification, and testing methods above. A bp Factory Rep. must be present during the installation, to verify the proper sealant and installation methods are applied. Note: Safety edges are not compatible with the bp – Water Certified Option, and will be disregarded, if requested in another portion of the specification.
- E. Wind Load: Withstand positive and negative wind loads equal to 25 PSF / 99mph, or as specified by local code; without damage or permanent set, when tested in accordance with ASTM E 330, using 10 second duration of maximum load. (As Licensed on the NFRC.org Website, with Certified Results).
- F. **Test Reports**: Provide an "**NFRC - Certified Report**" summary of the conforming test procedures and results, which include, but are not limited to: Air Infiltration, Water Resistance, Load, and Structural Testing in accordance with ASTM E-283, ASTM E-330, ASTM E-331, ASTM E-547. (As Licensed on the [NFRC.org](http://NFRC.org) Website, per Certified Results).



- G. Torsion Springs: Provide High Cycle Spring Life (20,000–100,000 cycles), as available per Manufacturer engineered calculations; at time of manufacture.
- H. Hinges & Fixtures: 12ga, Stainless Steel, Laser Cut, and Precision Formed, offset numbered type, and graduated to ensure weather tight fit.
- I. Rollers: Stainless Steel Stem, Bushing, and Fitting, with polymer coated races, 500lb-800lb capacity each roller, with precision Stainless Steel Ball Bearings, and mechanically sealed on both sides. [Note: Roller size (2" or 3") must match the appropriate track size]
- J. Additional Components: All components found in section 2.03 are to be provided by the door manufacturer (as a single source supplier) to ensure that manufacturers recommendations on various parts, have been tested, and properly combined to function as described.
- K. Stiles and Rails: Extruded aluminum with tensile strength of at least 38 ksi; (approximately double the strength of 6063-T6 alloy) and complying with ANSI/DASMA 102 / 103.

## **2.03 COMPONENTS**

- A. Stile & Rail Alloy: Extruded aluminum with tensile strength of at least 38 ksi; (approximately double the strength of 6063 alloy) and complying with ANSI/DASMA 102 / 103.
- B. Product Sizes: bp-550SHD (Top / Btm. rails: 7-3/8" tall x 24' door width max.); or as required per the Manufacturer's safety recommendations for the width, height, weight, and track operating clearance.
  - 1. Horizontal Meeting Rails: Combined overall width; 2-3/4" inch.
  - 2. Vertical Intermediate Center Mullions: 1-1/2" inch wide.
  - 3. End Stiles: 3-1/4" inch wide.
  - 4. Structural Fastening: Zinc-plated 5/16 inch thru-bolts, nuts, and tension indicating washers to secure stiles and rails.
- C. Door Thickness: 1 3/4" inch, nominal.
- D. Joints: Smooth and tight-fitting mitered joints.
- E. Glass Stop Moldings: "Aluminum" snap-in bead type. (No other material types accepted!)
- F. Configuration & Elevation: Product should conform to the general drawings provided, and consistent to the number of panels drawn in width, number of panels drawn in height; or per the safety limits and recommendations of the manufacturer.
- G. Glazing Panel Type:
  - 1. Insulated Glass Panels: CBA Certified Products through IGCC; tested in accordance with ASTM E-1290. Tempered glass, FT (Full Tempered); ASTM C-1036 and ASTM C-1048, Condition A, Quality q3, and meeting safety criteria of CPSC 16 CFR 1201, Categories 1-2, and ANSI Z97.1 (All garage doors)
  - 2. Water Resistance Option: doors 201/1, 201/2, 201/3, 201/4

- a. Makeup / Color / Type: ½" O.A. Thickness IG Units: 1/8" Tempered, Low-E Solarban-90, tint-Optigray (as per **NFRC CPD# BPC-A-1-00049-00001**) with 1/4" air space and 1/8" clear Tempered (required by code). Doors 201/1, 201/2, 201/3 201/4
  - b. Makeup/Color/ Type: ½" O>A> thickness IG units: 1/8" tempered, Low-3 Solarban 90, Transparent with ¼"air space with 1/8" clear tempered safety glass Doors: 108/2, 108/3, 108/4
- H. Counter Balance: Galvanized torsion springs, head plates, and center spring supports mounted on continuous torsion bar and adjusted to counter weight and travel of door.
  1. Cable Drums: Die cast aluminum, paired for track type indicated.
  2. Lift Cables: High tension aircraft cable: 1/8"-1/4" diameter; per Manufacturer requirements
  3. Springs: Galvanized and related hardware as necessary for system indicated.
- I. Track: Call Factory for Assistance: (877) 442-1716 to designate Track Type designated by the provided drawings and field conditions or choose the appropriate option below. As provided with all track systems: a continuous (floor to ceiling) steel support angles, with a slight taper; to ensure weather-tight fit when in the closed position.
  1. Track System Type: **Vertical Lift / High Lift Track** as shown on plans; or in accordance with manufacturer's recommendations based on door weight, height, field conditions at header or as drawn. Standard Track requires 24" min. head-room clearance: from door opening height, to the underside of a ceiling, or fist obstruction: Ex.: Bottom side of a joist, HVAC, Mechanical, Electrical, Plumbing, or other materials that could interfere with the door operation. See shop drawings for more clarity on unobstructed clearances], or in accordance with manufacturer's recommendations based on door weight, height, field conditions at header.
  2. Track Size: In accordance with manufacturer's recommendations; based on door weight, width, height, field conditions of header; or as drawn, and per local building code requirements. [Note: Do not exceed 800lbs on 2" track, or 1600lbs on 3" track, based on a formula of 5lbs per square ft.] 2" x 15ga or 3" x 12ga galvanized steel commercial track set, on continuous wall mounted angle support, which extends from the floor up to the door header.
  3. Support Angle: 12ga.- 8ga Galv. steel, or in accordance with manufacturer's recommendations, field conditions of header; or as drawn, and per local building code requirements.
  4. Standard Track Radius: 20 inch, or in accordance with manufacturer's recommendations based on door weight, height, track type and local building code requirements.
- J. Hinges & Fixtures: 12ga, Stainless Steel, Laser Cut, and Precision Formed, offset numbered type, and graduated to ensure weather tight fit.

- K. Rollers: Stainless Steel Stem, Bushing, and Fitting, with polymer coated races, 500lb-800lb capacity each roller, with precision Stainless Steel Ball Bearings, and mechanically sealed on both sides. [Note: Roller size must match the appropriate track type]
- L. Operators: Choose from (1) of the following: or [Call Factory for Assistance to designate exact type and model: (877) 442-1716] as provided by door manufacturer, and in accordance with recommendations based on door weight, height, track type, and local building code requirements.
  - 1. Lift Master: Model-MJ (Jackshaft Side Mount) Electric Operator with key station type control.
    - a. Electrical Characteristics: Phase: [Single/Mono], Volts: [110-120], Hertz: 60, Dedicated 20 amp circuit for a (1) Horse Power A/C motor
    - b. Key Switch: If electrified; and/or required for security, or to avoid non authorized personnel to operate.
- M. Operator Station Control: Push Button Station or Key Switch operation with Constant Contact Pressure, as provided by door manufacturer, and in accordance with manufacturer's recommendations and local building code requirements. The control station should be located and installed in close proximity to the door, motor operator (left or right side), and provide unobstructed line to site vision; when operating (opening / closing) the unit. [Per UL325]
- N. Floor Seal / Btm. Weather Stripping Gasket: Factory applied EPDM gasket full length of bottom section and at each end of top rail making contact with bumper spring.
- O. Side Jamb & Header Weather Stripping: (2) part extruded aluminum and (1) part EPDM system with fasteners concealed inside snap-on cover. (2) sets ea.; mounted at interior perimeter (between jambs and continuous mounted angle, including the header), in addition to the exterior perimeter.
- P. Threshold: 4"-6" wide x 1/2" high, Solid Aluminum Type. (Designed for heavy traffic [Pedestrian and Vehicular] with ADA compliance.) Tested for use with bp – Insulated Line, Air Infiltration, and Water-Resistant Packages.
- Q. Shop Drawings: Indicate accessories, opening dimensions and required tolerances, connection details, anchorage, spacing, hardware locations, and installation details.

## **2.04 FINISH**

- A. Color and Coating Type: As selected by Architect, from manufacturer's standard color range.
  - 1. **Powder Coat**: High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured AAMA 2604 Super Durable Coating. (10-year color fade warranty; verified by Manufacturer in writing)
    - a. Color: Dark Bronze - 10-year warranty.

- B. Field Touch-Up Materials: Spray Cans, or as recommended for field application.

## **2.05 MATERIALS**

- A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A 653 with G40 coating.
- B. Torsion Springs: Galvanized steel; ASTM A 227, Class II zinc coating in accordance with Section 9.2 of ASTM A 641, or Oil Coated per ASTM A 227 - Standard Specification for Steel Wire, Cold-Drawn for Mechanical Springs; 2006. Commercial Projects Include:
- C. Aluminum Sheet (Solid Aluminum Panels; if appl.): ASTM B 209, 5005 alloy, H14 temper, plain surface.
- D. Aluminum Extrusions: At least 38ksi tensile strength; ASTM B 221 and Aluminum Association (AA) standards.
- E. Stainless Steel Hinges & Fixtures: Graduated / Universal Hinges, Intermediate Hinges, Top Fixtures, Bottom Fixtures; and related hardware to be of 12ga. min. thickness, and 304 type min alloy.

## **2.06 REFERENCE STANDARDS**

- A. NFRC 100 – National Fenestration Rating Council Incorporated; Procedure for Determining Fenestration Product U-factors; 2010.
- B. NFRC 200 – National Fenestration Rating Council Incorporated; Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2010.
- C. NFRC 400 – National Fenestration Rating Council Incorporated; Procedure for Determining Fenestration Product Air Leakage; 2010.
- D. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2002.
- E. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
- F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2005.
- G. ASTM A 227 - Standard Specification for Steel Wire, Cold-Drawn for Mechanical Springs; 2006.
- H. ASTM A 641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009.
- I. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009a.
- J. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2007.

- K. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- L. ASTM B 244 - Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments; 2009.
- M. ASTM C 1036 - Standard Specification for Flat Glass; 2006.
- N. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- O. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2009.
- P. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- Q. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2010.
- R. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2009.
- S. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2009.
- T. ANSI/DASMA 102 - American National Standard Institute/Specifications for Sectional Overhead Type Doors; Door & Access Systems Manufacturers' Association, International; 2004.
- U. ANSI/DASMA 103 – American National Standard Institute/Standard for Counterbalance Systems on Residential Sectional Garage Doors; Door & Access Systems Manufacturers' Association, International; 2006.
- V. ANSI/DASMA 105 – American National Standard Institute/Test Method for Thermal Transmittance and Air Infiltration of Garage Doors; Door & Access Systems Manufacturers' Association, International; 2004.
- W. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

### **PART 3 - EXECUTION**

#### **3.01 VERIFICATION OF SITE CONDITIONS, MEASUREMENTS & REQUIREMENTS; PER SHOP DRAWINGS**

- A. Do not begin installation until opening(s) have been properly prepared.
- B. Verify that wall openings are ready to receive work, based on as built dimensions, and tolerances are within specified limits. If not possible, shop drawings must be sign off prior to fabrication.

- C. Verify that electric power is available and of the correct operator characteristics, if applicable.
- D. Verify that field conditions and structural blocking are acceptable, and are ready to receive this work.
- E. Verify that related items; whether provided under other sections or not (millwork, fixtures, shelves, cabinets, moldings, trim work, floor transitions to door frame, etc.), are properly located, and will not interfere with the door operation.
- F. Verify that built-in items (Electrical, Mechanical: Plumbing, HVAC Ducting & Registers, Fire Sprinklers, are in proper location, will not interfere with the proper operation of the door, operator, track, etc., and ready for installation of this work.
- G. Prime Contractor to verify required clearances and solid blocking requirements for door operation, including but not limited to; all existing equipment, structural, mechanical, or electrical components; near or around garage door **DO NOT CONFLICT WITH OVERHEAD ROLLING DOOR, ASSOCIATED TRACK, SOLID BLOCKING, OR OPERATOR** prior to fabrication or installation of new door units. Verify that the Head-Plate / Bearing Brackets are bolted directly to the structural header, and not sitting on the horizontal track. Negligence in doing so can result in death, injury, or damage.

### **3.02 PREPARATION**

- A. Prepare opening to permit correct installation of door to perimeter air and vapor barrier seal.
- B. Prime Contractor to verify required clearances and solid blocking requirements for door operation, including but not limited to; all existing equipment, structural, mechanical, or electrical components; near or around garage door. **DO NOT CONFLICT WITH OVERHEAD ROLLING DOOR, ASSOCIATED TRACK, SOLID BLOCKING, OR OPERATOR** prior to fabrication or installation of new door units. Verify that the Head-Plate / Bearing Brackets are bolted directly to the structural header, and not sitting on the horizontal track. Negligence in doing so can result in death, injury, or damage.

### **3.03 INSTALLATION**

- A. Install door unit assembly in accordance with manufacturer's instructions.
- B. Anchor assembly to wall construction and building framing without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware.
- E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 9005.
- G. Provide the necessary equipment for a safe installation, which include, but are not limited to; scissor lifts [doors over 8ft high], cranes, specialty hoisting, harness, or rigging equipment.

- H. Provide the necessary transporting of freight, shipping crates, boxes, and sundries to ensure the product is not damaged during shipping, transporting to the site of installation, or installation.
- I. Prime Contractor to verify required clearances and solid blocking requirements for door operation, including but not limited to; all existing equipment, structural, mechanical, or electrical components; near or around garage door. **DO NOT CONFLICT WITH OVERHEAD ROLLING DOOR, ASSOCIATED TRACK, SOLID BLOCKING, OR OPERATOR** prior to fabrication or installation of new door units. Verify that the Head-Plate / Bearing Brackets are bolted directly to the structural header, and not sitting on the horizontal track. Negligence in doing so can result in death, injury, or damage.

### **3.04 TOLERANCES**

- A. Maximum Variation from Plumb: 1/16 inch.
- B. Maximum Variation from Level: 1/16 inch.
- C. Maximum Deflection [Width or Height: 0.75%, when in the open or closed position.
- D. Maintain dimensional tolerances and alignment with adjacent work.
- E. Operating Weight: Door weights are approx. 5lbs. pr. sq. ft. max. (Based on 1/2" O.A. Insulated Glass Units: 1/8" Tempered; with 1/4" air spacer, and 1/8" Tempered – [as default].

### **3.05 ADJUSTING**

- A. Adjust door assembly for smooth operation and full contact with weather stripping.
- B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

### **3.06 CLEANING**

- A. Remove temporary labels and visible markings.
- B. Clean doors, frame rails, and glazing, with soapy water, and dry with a soft rag to avoid scratches.

### **3.07 PROTECTION**

- A. Protect installed products from damage during subsequent construction.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

**3.08 FENSTRATION ACCEPTANCE CERTIFICATE**

- A. Provide the "Certificate of Acceptance Form - **NRCA-ENV-02-A**" below; to the Architect of Record, and the local City Municipality, Building Dept., and/or Jobsite Inspector, to ensure the product will Pass Final Inspection.



<b>CERTIFICATE OF ACCEPTANCE</b>		<b>NRCA-ENV-02-A</b>
<b>Fenestration Acceptance Certificate</b>		<b>(Page 1 of 2)</b>
Project Name/Address:		
System Name or Identification/Tag: <b>"BP – Glass Garage Doors &amp; Entry Systems, Inc."</b>		System Location or Area Served: <b>USA, Canada, European Union:</b>
Climate Zone: ( ) <b>"BP – Glass Garage Doors are certified for Zones 1-7"</b>		Enforcement Agency Use: Checked by/Date

*Note: The Enforcement Agency may optionally verify any Fenestration being installed for authenticity by accessing <http://cmast.nfrc.org/Project/CertificateFind.aspx> for NFRC CMAST Certificate Labels or NFRC Certificate Labels <http://search.nfrc.org/search/searchDefault.aspx>. See Reference Nonresidential Appendix NA7 for additional information.*

**BUILDING INFORMATION**

BUILDING TYPE:	<input type="checkbox"/> Low-rise Nonresidential	<input type="checkbox"/> Low-rise Schools	<input type="checkbox"/> High Rise Residential	<input type="checkbox"/> Hotel/Motel Guest Room
PHASE OF CONSTRUCTION:	<input type="checkbox"/> New Building Construction		<input type="checkbox"/> Addition	<input type="checkbox"/> Alteration
TYPE OF LABEL CERTIFICATE:	<input checked="" type="checkbox"/> <b>Rated NFRC Component Modeling Approach</b>		<input type="checkbox"/> FC-1 for Nonrated	<input type="checkbox"/> FC-1 for Nonrated
	(CMA) Label Certificate or NFRC Certified Label		Fenestration Values < 1,000 ft <sup>2</sup>	Fenestration Values ≥ 1,000 ft <sup>2</sup>
TYPE OF INSTALLED FENESTRATION:	<input checked="" type="checkbox"/> <b>Vertical Fenestration</b>	<input type="checkbox"/> Tubular Daylighting Device (TDD)	<input type="checkbox"/> Skylight	<input type="checkbox"/> Dynamic Glazing
			<input type="checkbox"/> Window Film	<input type="checkbox"/> Block Glass

**STATEMENT OF ACCEPTANCE**

*This Certificate of Acceptance summarizes the results of the Acceptance test as specified in the Reference Nonresidential Appendix, NA7.4. Additional related references are in Sections §10-103(a)4, §10-111, §116(a)5 of the Energy Efficiency Standards.*

**SUMMARY OF FENESTRATION VERIFICATION AND INSPECTION BY RESPONSIBLE PARTY**

*Individuals who perform the field testing and verification work, and provide the information required for completion of the Certificate of Acceptance documentation are not required to be licensed professionals. However, the person who signs the Certificate of Acceptance document to certify compliance with the acceptance requirements shall be licensed as specified in Standards Section 10-103(a)4 and NA7.3.1.*

*The Responsible Person or Party shall verify the thermal performance (U-factor, SHGC and VT) of each specified fenestration product being installed matches the fenestration the NFRC Label Certificate, the CEC energy compliance documentation and building plans. Note: A maximum of 4 NFRC Product Listings for each Certificate of Acceptance.*

**For NFRC Rated Product (If more than 8 fenestration products use additional sheets)**

If Product is rated by NFRC then enter the ID # in each column. This includes any of the types of installed fenestration listed above.	1	2	3	4
	NFRC Label Certificate ID # <b>BPC-A-1-00049-00001</b>	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #
	5	6	7	8
	NFRC Label Certificate ID#	NFRC Label Certificate ID #	NFRC Label Certificate ID #	NFRC Label Certificate ID #

**For All Fenestration: Verify and Cross Reference:**

	1	2	3	4
If receipts or orders are available and it identifies the NFRC ID# then cross reference against the NFRC Label Certificate to match ID#s; or	<input type="checkbox"/> Delivery Receipt(s)	<input type="checkbox"/> Delivery Receipt(s)	<input type="checkbox"/> Delivery Receipt(s)	<input type="checkbox"/> Delivery Receipt(s) <input type="checkbox"/> Purchase Order or
	<input type="checkbox"/> Purchase Order or	<input type="checkbox"/> Purchase Order or	<input type="checkbox"/> Purchase Order or	<input type="checkbox"/> Detailed Receipt
Cross reference the efficiencies listed on the NFRC Label Certificate of FC-1 matches the building plans window schedule of efficiencies.	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans	<input type="checkbox"/> Cross Reference and Matches Building Plans

<b>CERTIFICATE OF ACCEPTANCE</b>		<b>NRCA-ENV-02-A</b>
<b>Fenestration Acceptance Certificate</b>		<b>(Page 2 of 2)</b>
Project Name/Address:		
System Name or Identification/Tag: <b>"BP – Glass Garage Doors &amp; Entry Systems, Inc."</b>	System Location or Area Served: <b>USA, Canada, European Union:</b>	

**FIELD TECHNICIAN'S DECLARATION STATEMENT**

- ☐ I certify under penalty of perjury, under the laws of the State of \_\_\_\_\_, the information provided on this form is true and correct.
- ☐ I am the person who performed the acceptance requirements verification reported on this Certificate of Acceptance (Field Technician).
- ☐ I certify that the construction/installation identified on this form complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- ☐ I have confirmed that the Installation Certificate(s) for the construction/installation identified on this form has been completed and is posted or made available with the building permit(s) issued for the building.

Company Name:		
Field Technician's Name:		Field Technician's Signature:
	Date Signed:	Position With Company (Title):

**RESPONSIBLE PERSON'S DECLARATION STATEMENT**

- ☐ I certify under penalty of perjury, under the laws of the State of \_\_\_\_\_, that I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this form.
- ☐ I am a licensed contractor, architect, or engineer, who is eligible under Division 3 of the Business and Professions Code, in the applicable classification, to take responsibility for the scope of work specified on this document and attest to the declarations in this statement (responsible person).
- ☐ I certify that the information provided on this form substantiates that the construction/installation identified on this form complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
- ☐ I have confirmed that the Installation Certificate(s) for the construction/installation identified on this form has been completed and is posted or made available with the building permit(s) issued for the building.
- ☐ I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Company Name:		Phone:
Responsible Person's Name:		Responsible Person's Signature:
License:	Date Signed:	Position With Company (Title):

**Documentation Author's Declaration Statement**

- ☐ I certify that this Certificate of Acceptance documentation is accurate and complete.

Name:	Signature:
Company :	Date:
Address:	If Applicable CEA or CEPE (Certification #):
City/State/Zip:	Phone:

**END OF SECTION 08113**

## **SECTION 08413 – GLAZED CURTAIN WALL & STOREFRONT SYTEMS**

### **1.1 Related Documents**

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

### **1.2 Summary**

- A. Section Includes: Kawneer Architectural Aluminum Curtain Wall Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
  - 1. Types of Kawneer Aluminum Curtain Wall include.
    - a. 601T Storefront System– 2" x 6" Front Set, Thermal Screw Spline, outside glazed, with 1" (25.4) insulating glass. Color: Dark Anodized Bronze
    - b. 1600 Wall System™2 Curtain Wall – 2-1/2" x 7-13/16", front set, outside glazed, structural silicone glazed (SSG) format with 1" insulated glass Color: Dark Anodized Bronze, Located at entrance tower
    - a. 451T Storefront System– 2" x 4-1/2" Front Set, Thermal Screw Spline, centered glazed, with 1" (25.4) insulating glass. Color: Dark Anodized Bronze
- B. Related Sections.
  - 1. 07270 "Water Resistive and Air Barrier Assemblies".
  - 2. 07920 "Joint Sealants".
  - 3. 08800 "Glazing".

### **1.3 Definitions**

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

### **1.4 Performance Requirements**

- A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
  - 1. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads. Failure also includes the following.
    - a. Thermal stresses transferring to building structure.
    - b. Glass breakage.
    - c. Loosening or weakening of fasteners, attachments, and other components.
    - d. Failure of operating units.

- B. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C.
- D. Wind loads: Provide Curtain Wall system; include anchorage, capable of withstanding wind load design pressures based on the 2018 International Building Code.
- E. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft<sup>2</sup> (0.3 l/s • m<sup>2</sup>) at a static air pressure differential of 6.2 psf (300 Pa).
- F. Water Resistance, (static): The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
- G. Water Resistance, (dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 psf (575 Pa) as defined in AAMA 501.
- H. Uniform Load: A static air design load of 40 psf (1915 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
- I. Seismic: When tested to AAMA 501.4, system must meet design displacement (elastic) of 0.010 x the story height and ultimate displacement (inelastic) of 1.5 x the design displacement.
- J. Energy Efficiency:
  - 1. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than: Project Specific ( .402 ) BTU/hr/ft<sup>2</sup> /°F per NFRC 100.
- K. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 68<sub>frame</sub> and 59<sub>glass</sub> (clear glass and tinted glass).

### **1.5 Submittals**

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes..
- B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified pre-construction testing agency, for glazed aluminum curtain walls, indicating compliance with performance requirements.



- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed curtain wall systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following.
  - 1. Joinery.
  - 2. Glazing.

#### **1.6 Quality Assurance**

- A. Installer Qualifications: Installer who has had successful experience with installation of the same or similar systems required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum curtain walls that meet or exceed performance requirements.
- C. Source Limitations: Obtain aluminum curtain wall system through one source from a single manufacturer.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
  - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockups for type(s) of curtain wall elevation(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

#### **1.7 Project Conditions**

- A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain walls by field measurements before fabrication and indicate measurements on Shop Drawings.

#### **1.8 Warranty**

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
  - 1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

### **PART 2 - PRODUCTS**

#### **2.1 Manufacturers**

- A. Basis-of-Design Product.
  - 1. Kawneer Company Inc..
  - 2. 1600 Wall System™2 Curtain Wall.

- a. Frame depth options: 2-1/2" x 7-1/2" (63.5 x 190.5), outside glazed, structural silicone glazed (SSG) format, with 1" (25.4) insulating glass and 1/4" (6.3) monolithic glazing.. (dark anodized bronze)
- 3. 601T Storefront system: 2" x 6", Front set, thermal screw-spline, outside glazed, 1" glazing (dark anodized bronze)
- 4. 451T Storefront system: 2" x 4-1/2" front set, thermal screw-spline, center glazed, 1" glazing (dark anodized bronze)
- B. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.
- C. Tested to AAMA 501, ASTM E 1886, E 1996 and TAS 201, 202, 203.

## **2.2 Materials**

- A. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.78) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
- C. Fasteners: ponents.
- D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Pressure Plate: Pressure plate shall be aluminum and fastened to the mullion with stainless steel screws.
- F. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- G. Sealant: For sealants required within fabricated curtain wall system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- H. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides a minimum 1/4" (6.3) separation.
- I. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall members are nominal and in compliance with AA Aluminum Standards and Data.

## **2.3 Curtain Wall Framing**

- A. Framing Members: Manufacturer's standard extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.  
Glazing System: Structural silicone glazed (SSG).  
Glazing Plane: Front.

- B. Glass: 1" (25.4). VITRO ARCHITECTURAL GLASS, Solarban 90 (2) tinted + clear glass. Insulating glass units: ¼" Solarban 90, Optigray, low e, ½" air space, ¼" clear tempered on interior  
Location: Curtain wall at entry and storefront windows.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Framing Sealants: Shall be suitable for glazed aluminum curtain wall as recommended by sealant manufacturer.
- E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- F. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- G. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- H. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle curtain wall material and components to avoid damage. Protect curtain wall material against damage from elements, construction activities, and other hazards before, during and after installation.

## **2.4 Glazing**

- A. Glazing: Comply with Division 08 Section "Glazing". Following glazing options are available.
  - 1. 1600 Wall System™2 Curtain Wall: Outside glazed, structural silicone glazed (SSG) format with 1" (25.4) insulating glass.
  - 2. 601T Storefront system: front set, 1" glazing
  - 3. 451T Storefront system: Center set, 1" glazing
- B. Glazing Gaskets: Gaskets to meet the requirements of ASTM C864.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: As recommended by manufacturer for joint type.

## **2.5 Operable Units**

- A. Doors: Comply with Division 08 Section "Aluminum-Framed Entrances and Storefronts".
  - 1. SEE DRAWINGS
  - 2. Kawneer, Thermal entrance doors, (pair) 3'-0" x 7'-11"
  - 3. Hardware: See sheet A411

## **2.6 Accessory Materials**

- A. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

## **2.7 Fabrication**

- A. Form or extrude aluminum shapes before finishing.



- B. Fabricate components that, when assembled, have the following characteristics.
  - 1. Profiles that are sharp, straight, and free of defects or deformations.
  - 2. Accurately fitted joints.
  - 3. Physical and thermal isolation of glazing from framing members.
  - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 5. Provisions for field replacement of glazing from exterior.
  - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
  - 7. Internal weeping system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
- C. Curtain Wall Framing: Fabricate components for assembly using shear block system following manufacturer's standard installation instructions.
- D. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## **2.8 Aluminum Finishes**

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Factory Finishing.
  - 1. Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating Color: Dark Bronze anodized

## **EXECUTION**

### **2.1 Examination**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **2.2 Installation**

- A. General: Install curtain wall systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.
  - 1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
  - 2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" (228.6) on center.
  - 3. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.
- B. Related Products Installation Requirements.
  - 1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.

2. Glass: Refer to Glass and Glazing Section.
  - a. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

### **2.3 Field Quality Control**

- A. Field Tests: Architect shall select curtain wall units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
  1. Testing: Testing shall be performed per AAMA 503 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements.
    - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft<sup>2</sup>, which ever is greater.
    - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 8 psf (383 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

### **2.4 Adjusting, Cleaning and Protection**

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.
- B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

**END OF SECTION 08413**

**SECTION 08423 – REVOLVING DOOR**

**PART I – GENERAL**

**1.01 SECTION INCLUDES**

- A. This section covers the furnishing and installation of a complete BoonAssist TQM Revolving Door System. Provide complete system that has been fabricated and tested for proper operation. It includes curved sidewalls, canopy, ceiling, door wings, hardware, glass, drive system and emergency collapsing mechanism as required for installation.

**1.02 RELATED SECTIONS**

- A. Section 07915 - Sealants, Caulking and Seals
- B. Section 08400 - Entrances and Storefronts
- C. Section 08710 - Door Hardware
- D. Section 08810 - Glass and Glazing
- E. Section 09600 - Flooring
- F. Section 16123 - Electrical Supply and Termination

**1.03 REFERENCES**

- A. ANSI/BHMA A156.27 – American National Standard for Power and Manual Operated Revolving Pedestrian Doors.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials used in Buildings.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum
- D. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- F. ASTM A 480/A 480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
- G. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer shall be a company specializing in the supply of revolving doors with a minimum of 10 years experience.
- B. Installer shall supply a factory-trained supervisor during installation of the door.

**1.05 SUBMITTALS**

- A. Submit project specific shop drawings and finish samples as required.
- B. Indicate pertinent dimensions, general construction, component connections and locations, anchorage methods and locations.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to job site in manufacturer's packaging undamaged, complete with installation and operating manuals.
- B. Store off ground, under cover, protected from weather and construction activities.

**1.07 PROJECT/SITE CONDITIONS**

- A. Install revolving doors on finished floor only. Floor must be dead level at any point within the footprint of the revolving door.

**1.08 WARRANTY**

Boon Edam warrants its products against defects in material and workmanship for a period of twelve (12) months from the date of shipment of the product. This warranty excludes glass breakage, normal wear on finishes or damage that occurs due to abuse, misuse or acts of God

**1.09 PLANNED MAINTENACE AAADM INSPECTION PER YEAR**

Work to include 1 year option for Planned Maintenance/AADM Inspection per year.

**PART II – PRODUCTS**

**2.01 MANUFACTURER**

BoonAssist TQM Revolving Door as manufactured by:

Boon Edam, Inc., 402 McKinney Parkway, Lillington, NC 27546.

(910) 814-3800 Fax: (910) 814-3899 Homepage: [www.boonedam.us](http://www.boonedam.us)

Local contact: DH Pace, Jimmy Jones, Sr District Sales Manager, [Jimmy.Jones@dhpac.com](mailto:Jimmy.Jones@dhpac.com)

Office: 816-221-0072 Cell: 816-918-8499

**2.02 DOOR CONSTRUCTION**

- A. Curved Enclosure Walls: Shall have a standard inside diameter of 7'-0" and be manufactured from six (6) extruded aluminum posts and two (2) extruded aluminum bottom rails.
- B. Canopy: Shall consist of four (4) one-piece extruded aluminum sections. Available in 12".
- C. Door Wings narrow stile: Three (3) or Four (4) door wings as designed and manufactured of 1 5/8" x 2 5/8" narrow stile aluminum extrusions and reinforced with internal aluminum door corners for strength. Door wings must utilize removable horsehair weather stripping on three sides. Door wings must be capable of folding forward or backward allowing for emergency egress.
- D. Ceiling: Shall be fabricated of formed aluminum sheet in a pie-shaped configuration. Each section must be secured in position and removable only by authorized personnel.
- E. Tempered/Laminated Glass Ceiling (Optional): 11/16" clear tempered/laminated safety glass is available as an option. All glass shall meet ANSI standard Z 97.1. Boon Assist drive located in floor with glass ceiling option. There is no canopy with this option.

**2.03 EQUIPMENT**

- A. BoonAssist drive system: The BoonAssist TQM is in principle a manually operated door. The unique drive system provides a power assist during normal operation. This means that the user of the door only has to push with a low force to operate the door, as about half the necessary force to turn the doorset is provided by the drive unit. The positioning feature turns the doorset to its rest position when nobody is pushing the door anymore. The drive system also functions as a speed-limiting device, preventing the door from speeding up during manual operation.

- B. Emergency Collapsing Mechanism: Precision-engineered door hangers and disks that allow the door wings to be collapsed, or folded, and stored in a bookfold position. Hangers and disks are finished in black and provide tension to hold the door wings in position until a strong force, not to exceed 130 pounds is applied to the outer stile of the door wing to meet NFPA, BOCA code requirements.
- C. Surface Applied Slide Bolt Locks: Two (2) standard 1 3/4" x 5 5/8" surface-mounted deadbolt locks finished to match door with removable, keyed cylinders that lock into the ceiling or floor on the two interior door wings.
- D. Lights (Optional): Provide (up to 4) 12V 20W Halogen lamps, 4 3/4" diameter lights to be recessed into ceiling. (120 – 230 VAC power service required from above by others.)

## **2.04 HARDWARE/MATERIALS**

- A. Tempered Glass: All flat glass in door wings shall be 1/4" clear tempered safety glass; all curved glass shall be 1/4" clear bent tempered safety glass. All glass shall meet ANSI standard Z 97.1.
- B. Laminated Glass (Optional): 7/16" clear curved laminated safety glass is available as an option. All glass shall meet ANSI standard Z 97.1.
- C. Tempered/Laminated Glass Ceiling (Optional): 11/16" clear tempered/laminated safety glass is available as an option. All glass shall meet ANSI standard Z 97.1.
- D. Aluminum Extrusions: All commercial grade extrusions shall be of aluminum alloy 6063-T6 per ASTM B-221.
- E. Aluminum Sheets: Shall meet ASTM B-209 and be of .063 minimum thicknesses.
- F. Weather Stripping: Genuine horsehair weather stripping on all required edges of door wings to provide a seal between door wings and drum that meets ASTM E-283.
- G. Bumpers: rigid, rubber-tipped bumper located on the top door rail of each door wing to prevent door wings from contacting one another when in the book fold position.
- H. Glazing Seal: All glass to be sealed with push in glazing vinyl.
- I. Pivot: Floor mounted pivot under the center shaft to provide smooth rotation.
- J. Center Shaft: Extruded center shaft shall be of aluminum alloy 6061-T6 per ASTM B-221 with connections to the speed control and pivot.
- K. Push Bars: Provide 1 1/4" x 1/2" extruded aluminum push bar (1) per door wing finished to match door. (1" diameter aluminum, stainless steel, or architectural bronze are available as an option.)
- L. Dust Cover: Made of HDPE (high density poly ethylene) material. Placed on top of canopy.
- M. Weather Resistant Dust Cover (Optional): Made of HDPE (high density poly ethylene) material covered with a rubber membrane and trimmed with a "T" ring and scuppers. Placed on top of canopy.

## **2.05 FINISH**

The following finishes are available for the enclosure walls, rotating door wings and ceiling.

A. Anodized Coatings

1. AAMA 611 Architectural Class 1 anodized Type AA-M10C22 A44: Dark Bronze

## **PART III – EXECUTION**

### **3.01 INSTALLATION**

- A. Inspection: Installer must examine the location and advise the Contractor of any site conditions unacceptable for proper installation of product. These conditions include but are not limited to the following:
1. Door must be installed on finished floor.
  2. Finished floor must be dead level at any point within the footprint of the door  
Installation shall not begin until these conditions are met.
- B. Erection: Install revolving doors in accordance with manufacturer's printed instructions. Set units level, plumb, and with uniform hairline joints. Anchor securely into place. Use only factory-trained installers.
- C. Adjustment: Installer shall adjust door and hardware for smooth operation and proper performance.
- D. Instruction: A factory-trained installer shall demonstrate to the owner's maintenance crew the proper operation of the door and the necessary service requirements such as lubrication, cleaning, and inspection of components upon completion of installation.
- E. Cleaning: Clean metal and glass surfaces carefully after installation to remove excess caulk, dirt and labels.

END OF SECTION 084233

**SECTION 08711 - DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Commercial door hardware for the following:
    - a. Swinging doors.
    - b. Other doors to the extent indicated.
- B. Related Sections include the following:
  - 1. Division 8: Hollow Metal Doors and Frames.
  - 2. Division 8: Stile and Rail Wood Doors.
  - 3. Division 8: Aluminum Framed Curtain Wall System and Storefront System
- C. Products furnished, but not installed: Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.

**1.3 SUBMITTALS**

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
    - a. Organize door hardware sets in same order as in the Door Hardware Schedule at the end of Part 3.
  - 3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.

- d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
  - e. Explanation of abbreviations, symbols, and codes contained in schedule.
  - f. Mounting locations for door hardware.
  - g. Door and frame sizes and materials.
- 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Supplier, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of cylinders.
- D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- E. Warranties: Special warranties specified in this Section.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct, factory-authorized distributor of the specified hardware products.
  - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- E. Regulatory Requirements: Comply with provisions of the following:
  - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
      - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
    - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
  - 2. NFPA 101: Comply with the following for means of egress doors:



- a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
  - b. Thresholds: Not more than 1/2 inch high.
- F. Keying Conference: Conduct conference to comply with requirements in Division 1 Section "Project Meetings." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
  - 1. Function of building, flow of traffic, purpose of each area, degree of security required and plans for existing and future key system expansion.
  - 2. Preliminary key system schematic diagram.
  - 3. Requirements for key control system.
  - 4. Address for delivery of keys.
- G. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Include in conference decisions regarding proper installation methods and the procedures for receiving and handling hardware.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review required testing, inspecting, and certifying procedures.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver master keys directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### **1.6 COORDINATION**

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

#### **1.7 WARRANTY**

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of door hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

- C. Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods: Five years for latches and locksets and ten years for manual door closers.

## **1.8 MAINTENANCE SERVICE**

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.

## **PART 2 - PRODUCTS**

### **2.1 SCHEDULED DOOR HARDWARE**

- A. General: Provide door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.
  - 1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule. **(Source manufacturer listed in boldface).**

### **2.2 HINGES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Hinges:
    - a. **McKinney Products (MC)**
  - 2. Continuous Geared Hinges:
    - a. **Pemko Manufacturing (PE).**
    - b. **McKinney Products (MC).**
- B. Standards: Comply with the following:
  - 1. Butts and Hinges: BHMA A156.1.
  - 2. Template Hinge Dimensions: BHMA A156.7.
- C. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches.
  2. Three Hinges: For doors with heights 61 to 90 inches.
  3. Four Hinges: For doors with heights 91 to 120 inches.
  4. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches (of door height greater than 120 inches).
- D. Template Requirements: Except for hinges to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- E. Hinge Weight: Unless otherwise indicated, provide the following:
1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
  2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.
- F. Hinge Base Metal: Unless otherwise indicated, provide the following:
1. Exterior Hinges: Brass/Bronze or Stainless steel.
  2. Interior Hinges: Steel
- G. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:
1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
    - a. Out-swinging exterior doors.
  2. Corners: Square.
- H. Continuous-Geared Hinges: Minimum 0.120-inch thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame. Finish components after milling and drilling are complete. Fabricate hinges to template screw locations.
- I. Fasteners: Comply with the following:
1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
  2. Wood Screws: For wood doors and frames.

## **2.3 LOCKS AND LATCHES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Mechanical Locks and Latches:
    - a. **Yale Commercial Hardware (YA) - No Substitution.**
- B. Standards: Comply with the following:
1. Bored Locks and Latches: BHMA A156.2.
- C. Bored Locks: BHMA Grade 1 and 2, Series 4000.
- D. Lock Trim: Match the following design style:
1. **See hardware schedule.**

- E. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
  - 1. Bored Locks: BHMA A156.2.
- F. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
  - 1. Bored Locks: Minimum 1/2-inch latchbolt throw.
- G. Backset: 2-3/4 inches unless otherwise indicated.

## **2.4 CYLINDERS AND KEYING**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. **Cylinders: Same manufacturer as for locks and latches. No Substitution.**
  - 2. Key Control Systems:
    - a. **Yale (YA)**
  - 3. **Keying:** All new locks and cylinders shall be keyed to a new grand master key system. A keying meeting with the Owner will be required before the locks and cylinders can be ordered.
- B. Standards: Comply with the following:
  - 1. Cylinders: BHMA A156.5.
  - 2. Key Control System: BHMA A156.5.
- C. Cylinder Grade: BHMA Grade 1
- D. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
  - 1. Number of Pins: Six
  - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
- E. Keying System: Unless otherwise indicated, provide for a keying system complying with the following requirements:
  - 1. Master Key System: Cylinders are factory keyed operated by a change key and master key.
- F. Keys: Provide nickel-silver keys complying with the following:
  - 1. Quantity: In addition to one extra blank key for each lock, provide the following:
    - a. Cylinder Change Keys: Three.
    - b. Master Keys: Six.

**2.5 STRIKES**

- A. Standards: Comply with the following:
  - 1. Strikes for Bored Locks and Latches: BHMA A156.2.
- B. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
  - 1. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 2. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

**2.6 EXIT DEVICES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Exit Devices:
    - a. **Sargeant (SA) No substitutions**
- B. Standard: BHMA A156.3.
  - 1. Exit Devices: BHMA Grade 1.
- C. Certified Products: Provide exit devices listed in BHMA's "Directory of Certified Exit Devices."
- D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.
- E. Through Bolts: For exit devices and trim installed on all doors.

**2.7 CLOSERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Surface-Mounted Closers:
    - a. **Norton (NO) Door Controls - No Substitution.**
- B. Standards: Comply with the following:
  - 1. Closers: BHMA A156.4.
- C. Surface Closers: BHMA Grade 1.
- D. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force
- E. Closer Options: As indicated in hardware sets, provide door closer options including: positive stop and hold open arms, extra duty arms, compression stop and hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required on fire rated wood composite door openings.

**2.8 OPERATING and PROTECTIVE TRIM UNITS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Metal Protective Trim Units:
    - a. **Pemko (PE)**
    - b. **Rockwood Manufacturing Co. (RO)**
- B. Standard: Comply with BHMA A156.6.
- C. Materials: Fabricate protection plates from the following:
  - 1. Brass/ Bronze and Stainless Steel: .050 inches thick, beveled top and 3 sides.
- D. Push-Pull Design: 3/4" Round with 8" Centers.
- E. Fasteners: Provide manufacturer's designated fastener type as indicated in Door Hardware Schedule.
- F. Furnish protection plates sized two inches less than door width (LDW) on push side and by height specified in Door Hardware Schedule.

**2.9 STOPS AND HOLDERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. **Pemko (PE)**
  - 2. **Rockwood Manufacturing Co. (RO)**
- B. Standards: Comply with the following:).
  - 1. Stops and Bumpers: BHMA A156.16.
  - 2. Combination Overhead Holders and Stops: BHMA A156.8.
  - 3. Door Silencers: BHMA A156.16.
- C. Stops and Bumpers: BHMA Grade 1.
- D. Combination Overhead Stops and Holders: BHMA Grade 1.
  - 1. **Rixson Hardware (RX) – 1, 9 and 10 Series. No Substitution.**
- E. Stops: Shall be wall mounted type where possible; where not possible, furnish floor type or overhead type as specified or required.
- F. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame.

**2.10 DOOR THRESHOLDS AND WEATHERSTRIPPING**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Door Thresholds and Weatherstripping:

- a. **Pemko Manufacturing (PE)**
- b. **McKinney Products (MC).**

- B. Standard: Comply with BHMA A156.22.
- C. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide non-corrosive fasteners for exterior applications and elsewhere as indicated.
  - 1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
  - 2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
  - 3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

## **2.11 FABRICATION**

- A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
  - 1. Manufacturer's identification will be permitted lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
  - 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

## **2.12 FINISHES**

- A. Standard: Comply with BHMA A156.18.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 652: Satin chromium plated over nickel, over steel base metal.
2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
3. BHMA 630: Satin stainless steel, over stainless-steel base metal.
4. BHMA 689: Aluminum painted, over any base material.
5. BHMA 613: Antiqued bronze, oiled, over bronze base metal.
6. BHMA 609: Dull brass, oxidized, over brass base metal.
7. BHMA 690: Dark bronze painted, over any base material.
8. BHMA 622: Satin black, over steel base metal.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

#### **3.2 PREPARATION**

- A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

#### **3.3 INSTALLATION**

- A. Mounting Heights: Mount door hardware units at heights indicated in the following applicable publications, unless specifically indicated or required to comply with governing regulations:
  1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
  3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
    - a. Mount door hardware in accordance with the requirements of the "Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities" (ADAAG).
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
  1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.



2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

### **3.4 FIELD QUALITY CONTROL**

- A. Architectural Hardware Consultant: A qualified Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
  1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

### **3.5 ADJUSTING**

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

### **3.6 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### **3.7 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

### **3.8 DOOR HARDWARE SCHEDULE**

- A. **Provide hardware as specified in the schedule below. Any substitutions are to be approved by Architect. No substitutions**

## **Hardware Sets**

### **SET #1**

Door: 101/1 Revolving Door

Hardware by Revolving Door manufacturer

### **SET #2**

Door: 101/2 Entry to Vestibule (3'-6" x 7'-10") Hardware by Storefront System Manufacturer

Hardware by Storefront System Manufacturer – See D1/A410

### **SET #3**

Doors: 108/1, 108/5, 201/5/1, 201/6, 201/7 Covered Patio & Bar Dining (3'-0" x 8'-0") – Hardware by Storefront System Manufacturer

Hardware by Storefront System Manufacturer – Sheet A2/A411

1 Rim Cylinder	1109	626	YA
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### **SET #4**

Door: 104/1 (Side Pick-up Service Door – Special Lite door with aluminum frame (3'-0 x 7'-8"))

1 Continuous Hinge	by Special Lite with door	Sueded Black	Sargeant
1 Exit Device	8804 – {PSB 36"	613	YA
1 Rim Cylinder	1109	Black	NO
1 Closer	PR7500 w/closer accessory 6890-690 finish	613	RX
1 Overhead Stop	I-366	613	RX
1 Weatherstrip	303 DS 1 x 36" x 92"		PE
1 Rain Drip	346 D 40"		PE
1 Door Sweep	to be provided by Special Lite door		PE
1 Threshold	229 D 36"		PE
	Provide flat headed tapcon (3 min at threshold)		

### **SET #6 (Men's and Women's)**

Doors: 114/1, 115/1, 1115/2 AND 115/3 Accessible Toilet Stalls (3'-0" x 6'-6")

3 Spring Hinges	1502 4 ½ x 4 1	US26D	MC
1 Full Mortis Hinge	TA2714 4.x x 4.5 AWS	US26dMC	MC
1 YPL cylindrical lockset w/indicator status	YPLO2 AU trim design	626	AC(YA)
1 Wall Bumper	409	626	RO
3 Door Silencers	609	Grey	RO

**SET #7** (Men's and Women's Restroom Vestibule)

Doors: 114/2, 115/4 Restroom Vestibule (3'-0" x 7'-0")

Hardware by Storefront System Manufacturer – See A2/A411

1 Rim Cylinder	1109	626	YA
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**SET #8**

Door: 117/1 Prep Kitchen (3'-6" x 7'-0" Special Lite door with aluminum frame)

1 Continuous Hinge	By Special Lite with Door	-	-
1 Conventional Rim Cylinder	1109 6-Pin 1145	613E	YA
1 Rim Device	LC-8804J PSB	BSP	SA
1 Surface Closer	PRO7500 M 6891	693	NO
1 Surface Overhead Hold Open	9-426	613	RX
1 Protection Plate	K1050 34" x 40" BEV CSK	US10B	RO
1 Threshold	229D 42" Tapcons	D	PE
1 Weather stripping w/applied stop	By Special Lite with Door	-	-
1 Rain Drip	346D 46"	D	PE
1 Door bottom sweep/	By Special Lite with door	-	-

**SET #9**

Doors: 122/1 and 126/1 Exterior Storage (3'-0" x 7'-0") HM

1 Geared Continuous Hinge	CFM83HD1 Thread forming	C	PE
1 Cylindrical Storeroom Lock	AU5405LN 694 497	626	YA
1 Surface Overhead Stop	9-336	630	RX
1 Jamb Weatherstrip	303 AS 1 x 36" 2 x 84"	C	PE
1 Door Bottom Sweep	3452 CNB 36"	A	PE
1 Threshold	271A 36" Tapcons	A	PE
3 Silencers	608-RK	Grey	RO

**SET #10**

Door: 134/1 Data Closet (Pair 2'-6" x 9'-0")

8 Full Mortise Hinge	TA2714 4 1/2 X 4 1/2	US26D	MC
1 Cylindrical Storeroom Lock	AU 5405LN 694 407	626	YA
1 Manual Flush Bolt	555 12" US26D	626	RO
1 Manual Flush Bolt	555 36"	626	RO
2 Door Bottom Sweep	3452 CNB 30"	C	PE
1 Weatherstrip	303 AS 1 x 60" 2 x 108"	alum	PE
1 ea. Dust Proof Strike	570	US26D	RO
3 Silencers	608-RKW	Gray	RO

**SET #11**

Door: 128/1 Delivery Enclosure (3'-6" x 7'-0' Special Lite door with aluminum frame)

1 Continuous Hinge	By Special Lite with Door		
1 Rim Device	LC-8804J PSB	BSP	SA
1 Conventional Rim Cylinder	1109 6-PIN 1145	613E	SA
1 Surface Closer	PRO7500 M 6891	693	NO
1 Surface Overhead Closer	9-426	613	RX
1 Protection Plate	K1050 34" x 40" B4E CSK	US10b	RO
1 Door Bottom Sweep	By Special Lite with Door	-	-
1 Weather stripping w/applied stop	By Special Lite with Door	-	-

**SET #12**

Door: 129/1 Employee Toilet (3'-0" x 7'-0")

3 Full Mortise Hinge	T4A3786 4.5 x 4.5	US26D	MC
1 Surface Closer	7500 DA REG	689	NO
1 Surface Overhead Stop	10-336	642	RX
1 YPL cylindrical lockset w/indicator status	YPLO2 AU trim design	626	AC (YA)
1 Wall Bumper	409	626	RO
3 Door Silencers	609	Grey	RO

**SET #13**

Door: 133/1 Office (3'-0" x 7'-0")

3 Full Mortise Hinge	TA 2714 4.5 x 4.5	US26D	MC
1 Cylindrical Storeroom Lock	AU 5404 LN 694 497	626	YA
1 Surface Overhead Stop	10-336	652	RX
3 door silencers	608-RKW	Gray	RO

**SET #14**

Door: 130/1 Fire Riser Room (3'-6" x 7'-0' Special Lite door with aluminum frame)

1 Continuous Hinge	By Special Lite with Door		
1 Rim Device	LC-8804 x PSB	Black	Sargeant
1 Conventional Rim Cylinder	1109 6-PIN 1145	613E	YA
1 Surface Closer	7500 M PRO M 6891	BSP	NO
1 Surface Overhead Hold Open	9-426	613	RX
1 Protection Plate	K1050 34" X 40" BEV CSK	US10B	RO
1 Threshold	229D 42" Tapcons	D	PE
1 Weather stripping w/applied stop	By Special Lite with door	-	-
1 Rain drip	346 C 46"	D	PE
1 Bottom Sweep	Provided by Special Lite with door	-	-

**SET #15**

Trash Enclosure Gates

NOTE: contractor to provide hardware to hang and lock gates.

**SET #16**

**Hooks**

Bobick, Koala Kare, 310-54-KIT Bag Hook – Quantity: 7  
(Men's, Women's and Employee's Toilet)

National Hardware N337-915 Reed Modern Hook, Matte, (oil rubbed bronze)  
Bar Die Wall –Quantity: 27

**SET #17**

**MISCELLANEOUS:**

6 Master Keys	MASTER KEYS	YA
3 Cut Keys per Lock	CUT KEYS PER LOCK	YA

**Any substitutions to be approved by Architect. No substitutions for Exit Devices.**

**KEY NOTES:**

Yale	YA
Mckinney	MC
Sargeant	SA
Norton	NO
Pemko	PE
Rockwood	RO
Rixon	RX
Accentra (formerly Yale)	AC(YA)

**End of Section 08711**

**ns from Sargent Exit Devices and Yale Locks.**

**SECTION 08800 - GLAZING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
1. Exterior doors
  2. Curtain Wall Entry Door 1600 2 system (provided by curtain wall manufacturer)
  3. Curtain Wall Kawneer 601T system (provided by storefront system manufacturer)
  4. Curtain Wall Kawneer 451T system (provided by storefront system manufacturer)
  5. Interior glass on top of partitions at host stand

**1.2 DEFINITIONS**

- A. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- B. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- C. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

**1.3 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
  - 1. Minimum glass thickness, nominally of lites in exterior walls is 1/4-inch (6.0-mm).
  - 2. Minimum glass thickness, nominally of lites in interior walls varies, re: architectural drawings.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### **1.4 QUALITY ASSURANCE**

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."
  - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- B. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
- C. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
  - 1. Primary glass of each (ASTM C 1036) type and class indicated.
  - 2. Heat-treated glass of each (ASTM C 1048) condition indicated.
  - 3. Insulated glass panels.
- D. Single-Source Responsibility for Glazing Accessories.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

**1.6 PROJECT CONDITIONS**

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions, are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

**1.7 WARRANTY**

- A. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: 10-years from date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Product: Subject to compliance with requirements, provide product specified.
4. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
5. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.



## **2.2 GLASS PRODUCTS**

- A. Heat-Treated Float Glass (Tempered): ASTM C 1048; Type I (transparent flat glass); Quality Q3; of class, kind, and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
  2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
  3. For uncoated glass, comply with requirements for Condition A.
  4. For coated vision glass, comply with requirements for Condition C (other uncoated glass).
  5. Glass thickness varies, re: Architectural Drawings.
- B. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.
1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
  2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
  3. Sealing System: Dual seal.
  4. Spacer Specifications: Manufacturer's standard spacer material and construction.
  5. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
    - a. Spacer Material: Aluminum **DARK BRONZE**

## **2.3 GLAZING GASKETS**

- A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
1. Neoprene, ASTM C 864.
  2. EPDM, ASTM C 864.
  3. Silicone, ASTM C 1115.

4. Thermoplastic polyolefin rubber, ASTM C 1115.
  5. Any material indicated above.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
1. Neoprene.
  2. EPDM.
  3. Silicone.
  4. Thermoplastic polyolefin rubber.
  5. Any material indicated above.

## **2.4 ELASTOMERIC GLAZING SEALANTS**

- A. General: Provide products of type indicated, complying with the following requirements:
1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Colors of Exposed Glazing Sealants: Black.
- B. Elastomeric Glazing Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

## **2.5 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.1.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:

1. Type 1, for glazing applications in which tape acts as the primary sealant.
2. Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## **2.6 MISCELLANEOUS GLAZING MATERIALS**

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation. B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **2.7 FABRICATION OF GLAZING UNITS**

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

## **2.8 CLEAR FLOAT-GLASS**

- A. ncoated Clear Float-Glass Units: Class 1 (clear) Kind FT (fully tempered) float glass.
1. Thickness: As indicated on drawings.

## **2.9 INSULATING-GLASS UNITS**

- A. Clear Insulating-Glass Units:
1. Overall Unit Thickness and Thickness of Each Lite: As indicated on dwg (A901)
  2. Interspace Content: Air.

3. Outdoor Lite:
  - a. Curtain wall system and Storefront System– 1” Insulated Low E, ¼” Solarban 90, Optigray, tempered (Exterior), 1/2” air space, ¼” Clear (Interior)
  - b. Doors with glass – special lite exterior door with tinted glass (insulated)
  - c. Kind FT (fully tempered (building safety glass per code)
  - d. SEE COVER SHEET 2 – glass notes under IECC Requirements for Building Envelope
4. Indoor Lite: Class 1 (clear) float glass at host stand
  - a. Kind FT (fully tempered).
  - b. Tint Color: Clear

### **PART 3 - EXECUTION**

#### **3.1 GLAZING**

- A. General: Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
  1. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
  2. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
  3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
  4. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
  5. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
  6. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
  7. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

- B. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
1. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
  2. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
  3. Apply heel bead of elastomeric sealant where indicated on drawings.
  4. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
  5. Apply cap bead of elastomeric sealant over exposed edge of tape.
- C. Gasket Glazing (Dry): Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
1. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
  2. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
  3. Install gaskets so they protrude past face of glazing stops.
- D. Sealant Glazing (Wet): Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
1. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
  2. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### **3.2 GLASS SCHEDULE**

- A. Insulating Glass, Tempered: All exterior windows and within exterior door units
- B. Single sheet Tempered: All windows within interior of restaurant.

**3.3 CLEANING AND PROTECTION**

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.
- B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

**END OF SECTION 08800**

**SECTION 09260 - GYPSUM BOARD ASSEMBLIES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Section, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Nonload-bearing steel framing members for gypsum board assemblies.
  - 2. Gypsum board assemblies attached to wood framing and metal framing
  - 3. Cementitious backer units installed with gypsum board assemblies.
  - 4. Moisture resistant backer units for "tile" finish.
  - 5. FRP Wall panels.
  - 6. Division 9 Section "Tile" for moisture resistant units installed as substrates for ceramic tile.
- B. Refer to section 05400 for load bearing members and those backing up exterior brick.

**1.3 DEFINITIONS**

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

**1.4 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.

**1.5 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.
- B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver material in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

**1.7 PROJECT CONDITIONS**

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Steel Framing and Furring:
    - a. Clark Steel Framing, Inc.
    - b. Consolidated Systems, Inc.
    - c. Dale Industries, Inc.
    - d. Dietrich Industries, Inc.
    - e. National Gypsum Co.; Gold Bond Building Products Division.
    - f. Unitmast, Inc.
  - 2. Grid Suspension Gypsum Board Assemblies:
    - a. Armstrong World Industries, Inc.
    - b. Chicago Metallic Corp.
    - c. USG Interiors, Inc.
  - 3. Gypsum Board and Related Products:
    - a. Domtar Gypsum.
    - b. Georgia-Pacific Corporation.



- c. National Gypsum Co.; Gold Bond Building Products Division.
- d. United States Gypsum Co.

## **2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS**

- A. Cast-in-Place and Post-installed Anchors in Concrete: Anchors fabricated from corrosion-resistant materials, with holes or loops for attaching hanger wires, and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined by testing according to ADTM E 488 conducted by a qualified independent testing agency.
- B. Wire Ties: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.062-inch (1.6-mm) thick.
- C. Wire Hangers: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.162-inch (4.1-mm) diameter.
- D. Hanger Rods: Mild steel and zinc coated or protected with rust-inhibitive paint.
  - 1. Finish: Rust-inhibitive paint, unless otherwise indicated.
- E. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch (5-mm) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
  - 1. Thickness: 0.0179-inch (0.45-mm), unless otherwise indicated.
  - 2. Depth: 3-5/8-inch (92.1-mm), unless otherwise indicated.
  - 3. Protective Coating: Manufacturer's standard corrosion-resistant coating.
- F. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth of 7/8-inch (22.2-mm), and minimum thickness of base (uncoated) metal as follows:
  - 1. Thickness: 0.0179-inch (0.45-mm), unless otherwise indicated.
  - 2. Protective Coating: Manufacturer's standard corrosion-resistant coating.
- G. Grid Suspension System for Interior Ceilings: ASTM C 645, manufacturer's standard direct-hung grid suspension system composed of main beams and cross-furring members that interlock to form a modular supporting network.

## **2.3 STEEL FRAMING FOR WALLS AND PARTITIONS**

- A. General: Provide steel framing members complying with the following requirements:
  - 1. Protective Coating: Manufacturer's standard corrosion-resistant coating.
- B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and double over to form 3/16-inch (5-mm) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
  - 1. Thickness: 0.0179-inch (0.45-mm), unless otherwise indicated.
  - 2. Depth: 3-5/8-inch (92.1-mm), unless otherwise indicated.
  - 3. Spacing as appropriate for span/finish per manufacturer's recommendations.

- C. Deflection Track: Manufacturer's top runner complying with the requirements of ASTM C 645 and with 2-inch (50.8-mm) deep flanges.
  - 1. Top Runner with Slotted Flanges: 2-1/2-inch (63.5-mm) deep flanges with slots 1-inch (25.4-mm) o.c.
- D. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth and minimum thickness of base (uncoated) metal as follows:
  - 1. Thickness: 0.0179-inch (0.45-mm), unless otherwise indicated.
  - 2. Depth: 7/8-inch (22.2-mm).
- E. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

## **2.4 GYPSUM BOARD PRODUCTS**

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
  - 1. Widths: Provide gypsum board in widths of 48-inches (1219-mm).
- B. Gypsum Wallboard: ASTM C 36 and as follows:
  - 1. Type: Regular.
  - 2. Edges: Tapered.
  - 3. Thickness: 5/8-inch (159-mm) unless otherwise indicated.
- C. Flexible Gypsum Wallboard: ASTM C 36 manufactured to bend to fit tight radii and to be more flexible than standard regular-type panels of the same thickness, 1/4-inch (6.4-mm) thick, and with long edges tapered. Apply in double layer at curved assemblies.
- D. Sag-Resistant Gypsum Wallboard: ASTM C 36, manufactured to have more sag resistance than regular-type gypsum board, 1/2-inch (12.7-mm) thick, and with long edge tapers. Apply on ceiling and soffit surfaces.

## **2.5 TILE BACKING PANELS**

- A. Provide Tile Backing/Glass-Mat/Water-Resistant Board for all interior tile installation complying with ATSM C 1178/C 1178 M, of thickness indicated on drawings. Install to maximum lengths, minimizing end-to-end butt joints.
- B. Available Products: Subject to compliance with requirements, Glass-Mat, Water-Resistant Backing Board that may be incorporated in the Work include, but are not limited to, the following:
  - 1. GP Gypsum Corporation; Dens-Shield Tile Backer.

## **2.6 CEMENTITIOUS BACKER UNITS**

- A. Provide Cementitious Backer Units at wall behind and 18" around kitchen exhaust hood.

- B. Available Products: Subject to Compliance with requirements, Cementitious Backer Units that may be incorporated in the Work include, but are not limited to , the following:
  - 1. The Original Wonderboard; Custom Building Products.
  - 2. Wonderboard Multi+Board; Custom Building Products.
  - 3. DomCrete Cementitious Tile-Backer Board; Domtar Gypsum.
  - 4. Util-A-Crete Concrete Backer Board; FinPan, Inc.
  - 5. DUROCK Cement Board; United States Gypsum Co.

## **2.7 TRIM ACCESSORIES**

- A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
  - 1. Material: Formed metal, with metal complying with the following requirement:
    - a. Steel sheet zinc coated by hot-dip process or rolled zinc.
  - 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
    - a. Cornerbead on outside corners, unless otherwise indicated.
    - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
    - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
    - d. J-bead with face and back flanges; face flange formed to be left without application of joint compound. Use J-bead where indicated.
    - e. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

## **2.8 JOINT TREATMENT MATERIALS**

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufactures of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: paper reinforcing tape or pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Joint Tape for Cementitious Backer Units: As recommended by cementitious backer units manufacturer.
- D. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for used indicated.
  - 1. Where setting type joint compounds are indicated as a taping compoud only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
  - 2. For pre-filling gypsum board joints, use formulation recommended by gypsum board manufacturer.
  - 3. For topping compound, use sandable formulation.
- E. Joint Compound for Cementitious Backer Units: Material recommended by cementitious backer unit manufacturer.

**2.9 MISCELLANEOUS MATERIALS**

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Laminating adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.
- C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- D. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.
- E. Steel drill screws complying with ASTM C 1002 for the following applications:
  - 1. Fastening gypsum board to steel members less than 0.033-inch (0.84-mm) thick.
- F. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.
- G. Acoustical Sealant: As recommended by Gypsum Board Assembly manufacturer for application indicated.

**2.10 FRP WALL COVERING MATERIALS**

- A. Fiberglass Reinforced Plastic Panles
  - 1. Kemlite Company
    - a. Glasbord P – Class III (C) interior finish
    - b. Color : Pearl Gray
    - c. Finish: Embossed
    - d. Kemlite accessories

**2.11 AIR-INFILTRATION BARRIER**

- A. Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 30 asphalt felt), unperforated.

**2.12 VAPOR BARRIER**

- A. Polyethylene sheet, 0.0061-inch (0.15-mm) thick, formed by spinning continuous stands of fine, high-density polyethylene interconnected fibers and bonding them together by heat and pressure; incorporating an additive to provide ultralight resistance for up to 120 days; with a water-vapor transmission rate equaling 669 g in 24 hours through 1 sq. m of surface per ASTM E 96 procedure B and flame-spread and smoke-developed ratings of 0 and 25, respectively, per ASTM E 84.

**PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### **3.2 NON-LOAD-BEARING STEEL FRAMING INSTALLATION**

- A. Comply with ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Suspended Ceiling and Soffit Framing:
  - 1. Suspend ceiling hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
  - 3. Attach hangers to structural members. Do not support ceilings from or attach hangers to permanent metal forms, steel deck tabs, steel roof decks, ducts, pipes, or conduit.
  - 4. Screw furring to wood framing.
  - 5. Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.
  - 6. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- C. Wall Partition and Soffit Framing:
  - 1. Where studs are installed directly against exterior walls, install isolation strip between studs and wall.
  - 2. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
  - 3. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
    - a. Install two studs at each jamb, unless otherwise indicated.
    - b. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

4. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- D. Z-Furring Members: Erect insulation vertically and hold in place with Z-furring members.
  1. Until gypsum board is installed, hold insulation in place with **10-inch (250-mm)** staples fabricated from **0.0625-inch- (1.59-mm-)** diameter, tie wire and inserted through slot in web of member.
- E. Polyethylene Vapor Retarder: Install to comply with requirements specified in Division 7 Section "Building Insulation."

### **3.3 PANEL PRODUCT INSTALLATION**

- A. Gypsum Board: Comply with ASTM C 840 and GA-216.
  1. Space screws a maximum of **12 inches (304.8 mm)** o.c. for vertical applications.
  2. Space fasteners in panels that are tile substrates a maximum of **8 inches (203.2 mm)** o.c.
  3. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
  4. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
  5. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
  6. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
  7. Multilayer Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.
  8. Laminating to Substrate: Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- B. Tile Backing Panels:
  1. Water-Resistant Gypsum Backing Board: Install with **1/4-inch (6.4-mm)** gap where panels abut other construction or penetrations.
  2. Glass-Mat, Water-Resistant Backing Panel: Install with **1/4-inch (6.4-mm)** gap where panels abut other construction or penetrations.
  3. Cementitious Backer Unit Application: ANSI A108.11.

### **3.4 VAPOR BARRIER INSTALLATION**

- A. Install vapor barrier and cover with gypsum wallboard as follows:
  - 1. Apply plastic sheet according to manufacturer's printed recommendations with a 4-inch (102-mm) overlap.

### **3.5 FINISHING**

- A. Installing Trim Accessories: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Finishing Gypsum Board Panels: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
  - 1. Prefill open joints, beveled edges, and damaged surface areas.
  - 2. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
  - 3. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
  - 4. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.
- C. Cementitious Backer Units: Finish according to manufacturer's written instructions.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
  - 1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas.
  - 2. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated .

### **3.6 CLEANING AND PROTECTION**

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

**END OF SECTION 09260**

**SECTION 09310 - CERAMIC TILE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Floor tile in interior applications.
  - 2. Wall tile in interior application (men's and women's)
  - 3. Wall tile on bar die wall
  - 4. Wall tile in Bar & Dining
  - 5. Wall tile on exterior wall
- B. Virginia Tile will be provided through the Owner's National Account (contact: John Funk, (phone: 913-573-0578)
- C. Contractor to install and coordinate tile quantities with Owner's National Account

**1.2 SUBMITTALS**

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include tile locations and patterns. Include details and locations of contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples: At least 12 inch square Sample of each type, color, and texture of tile and grout combination required, mounted on braced cementitious backer units, and with joints grouted.

**1.3 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Full-size units equal to 3 percent of amount installed for each type, color, texture, and size indicated.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Product: Subject to compliance with requirements, provide the product specified.



**2.2 CERAMIC FLOOR TILE (Interior Applications)**

- A. 12" x 24" TILE – See finish selections sheet A902
- B. Base tile
  - 1. See finish selections sheet A902
- C. Setting Materials:
  - 1. Thin-Set Mortar: ANSI A118.4, latex portland cement.
- D. Grout Materials:
  - 1. Grout for Joints 1/8 inch and Narrower: ANSI A118.6, unsanded latex-portland cement
    - a. Color: As selected from manufacturer's full range
  - 2. Grout for Joints Wider than 1/8 inch. ANSI A118.6, commercial portland sanded latex-portland cement.
    - a. Color: As selected from manufacturer's full range.
  - 3. Grout boost: grout boost stain resistant grout additive to grout for mosaic floor tile.
    - a. Manufacturer: H.B. Fuller Construction Products, Inc.

**2.3 CERAMIC WALL TILE (Interior Applications)**

- A. Glazed Wall Tile:
  - 1. See Finish schedule A902
- B. Porcelain Wall Tile:
  - 1. See finish schedule A902
- C. Trim Units: Matching flat tile.
  - 1. Size: coordinate with size of flat tile.
  - 2. Shapes:
    - a. Wainscot Cap: Surface bullnose.
    - b. External Corners: Surface bullnose.
- D. Setting Materials:
  - 1. Setting Adhesive: ANSI A136.1, Type I, organic.
- E. Grout Materials:
  - 1. Grout for Joints Wider than 1/8 inch ANSI A118.6, sanded latex-portland cement.
    - a. Color: As selected from manufacturer's full range.

**2.4 ACCESSORY MATERIALS**

- A. Elastomeric Sealants: ASTM C 920.
  - 1. Non-Traffic Surfaces: One-part, mildew-resistant silicone, Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to substrate, O; with fungicide.

- a. Available Products:
  - 1) Dow Corning Corporation; Dow Corning 786.
  - 2) GE Silicones; Sanitary 1700.
  - 3) Pecora Corp.; Pecora 898 Sanitary Silicone Sealant.
  - 4) Rhone-Poulenc, Inc.; Rhodorsil 6B White.
  - 5) Tremco, Inc.; Tremsil 600 White.
- 2. Traffic Surfaces: Multipart, pourable urethane, Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to substrate, O.
  - a. Available Products:
    - 1) Bostik; Chem-Calk 550.
    - 2) Mameco International, Inc.; Vulkem 245.
    - 3) Pecora Corp.; NR-200 Urexpan.
    - 4) Tremco, Inc.; THC-900.
- 3. Colors: Match color of grout in adjacent tile.
- B. Moisture Resistant Backer Units: ANSI A 118.9, in maximum lengths and widths available to minimize joints.
  - 1. Thickness: 5/8 inch.
- C. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement based formulation approved by manufacturer of tile setting materials.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION, GENERAL**

- A. Installation Methods: Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA designations indicated.
- B. Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" applicable to installation methods and setting and grouting materials indicated.
- C. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by ANSI A108 Series tile installation standards for installations indicated.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Apply trowelable leveling and patching compounds to fill cracks, holes, and depressions in substrates.
- E. Remove substrate protrusions, bumps, and ridges by sanding or grinding.
- F. Waterproofing: Install to produce a waterproof membrane of uniform thickness that is securely bonded to substrate.
  - 1. Do not install tile over waterproofing until waterproofing has cured and has passed testing to determine that it is watertight.
- G. Metal Lath: Install and scratch coat to walls to comply with ANSI A108.1A, Section 4.1.

- H. Cementitious Backer Units: Install where indicated, and treat joints to comply with ANSI A108.11.
- I. Field-Applied Temporary Protective Tile Coating: Apply a continuous film to protect tile surfaces from adhesion of grout.
- J. Back Buttering: Produce 100 percent mortar coverage on tile backs to comply with applicable special requirements for back buttering in ANSI A108 Series tile installation standards in the following locations:
  - 1. Wall installations in wet areas.
  - 2. Wall installations composed of 8 by 8 inch tile or larger.
- K. Blending: For tile with color variations, install blended tiles to produce color variations that match approved Samples.
- L. Extend tile work into recesses and under or behind equipment and fixtures to produce a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- M. Accurately form intersections and returns. Cut and drill tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items to produce straight aligned joints. Fit tile to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- N. Jointing Pattern: Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.
  - 1. Lay tile in pattern indicated.
- O. Joint Widths: Produce uniform joint widths as follows:
  - 1. Floor Tile: Ceramic Tile, 1/16 inch.
  - 2. Wall Tile: Ceramic Tile, 1/16 inch
- P. Expansion Joints: Form expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
  - 2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."
- Q. Grout: Install to comply with ANSI A108.10, unless otherwise indicated.
  - 1. Chemical-Resistant Epoxy Grouts: Comply with ANSI A108.6.
- R. Cleaning: After grouting, clean ceramic tile surfaces so they are free of grout and foreign matter.
  - 1. Temporary Protective Coating: Remove by method recommended by coating manufacturer that is acceptable to tile and grout manufacturers. Trap and remove coating to prevent it from clogging drains.

### **3.2 FLOOR TILE INSTALLATION**

- A. Interior Installation Method: Bonded to subfloor with mortar.
  - 1. TCA Designation: F115 (thin- mortar bonded to concrete subfloor, with epoxy or furan grout)

### **3.3 WALL TILE INSTALLATION**

- A. Interior Installation Method: Thin-set mortar bonded to solid-panel substrate.
  - 1. TCA Designation: W243 (thin-set mortar bonded to gypsum board on studs).

**END OF SECTION 09310**

## **SECTION 09511 - ACOUSTICAL CEILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes ceilings consisting of acoustical panels and exposed suspension systems.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product specified.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of actual acoustical panels or sections of acoustical panels, suspension systems and moldings showing the full range of colors, textures, and patterns available for each type of ceiling assembly indicated.

#### **1.4 QUALITY ASSURANCE**

- A. Installer qualifications: Engage an experienced installer who has completed acoustical panel ceiling similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Source limitations for Ceiling Units: obtain each acoustical ceiling panel from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

**1.6 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

**1.7 COORDINATION**

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures. HVAC equipment, fire-suppression system, and partition assemblies.

**1.8 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with levels describing contents.
  - 1. Acoustical Ceiling Units: Full-size units equal to 2 percent of amount installed for each type, color, and pattern indicated. (Paint tiles to match ceiling paint color, before storing product.)
  - 2. Suspension System Components: Full-sized units of exposed components equal to 2 percent of amount installed for each type and color indicated.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated for each designation in the key notes of the reflected ceiling plans located within the drawings.

**2.2 ACOUSTICAL PANELS, GENERAL**

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
- B. Materials: Materials shall conform to the following. Comparable products of other manufacturers will be considered provided supporting data and information are submitted with the proposal.
  - a. See sheet A901 for materials

- C. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

## **2.3 METAL SUSPENSION SYSTEMS, GENERAL**

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 636 requirements.
- B. Materials: Materials shall conform to the following. Comparable products of other manufacturers will be considered provided supporting data and information are submitted with the proposal.
  - a. See sheet A901 for materials.

## **2.4 ACCESSORIES**

- A. Hanger Attachment Devices: Sized for 5 times the design load indicated in ASTM C 636, Table 1, Direct Hung, unless otherwise indicated.
  - 1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by a qualified independent testing agency.
  - 2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by a qualified independent testing agency.
- B. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel; ASTM A 641 (ASTM A 641M) Class 1 zinc coating, soft temper.
  - 1. Wire Diameter: Sized for yield stress of wire to exceed 3 times the hanger design load (ASTM C 635, Table 1, Direct Hung), but not less than 0.135-inch diameter wire.
- C. Sheet-Metal Edge Moldings and Trim: Manufacturer's standard for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; material and finish matching exposed flanges of suspension system runners.
- D. Extruded-Aluminum Edge Moldings and Trim: Match the Ceiling Suspension system.
- E. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Comply with CISCA's "Ceiling Systems Handbook."
  - 1. Measure each ceiling area and establish layout of panel units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders.
- B. Ceiling Suspension System Installation: Comply with ASTM C 636.
- C. Ceiling Suspension System Installation Requiring Seismic Restraint:
  - 1. UBC Standard 25-2.
  - 2. CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings--Seismic Zones 0-2."
  - 3. CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies--Seismic Zones 3 & 4."
  - 4. ASTM E 580.
- D. Hangers:
  - 1. Attach hangers to structural members. Do not support ceilings from or attach hangers to permanent metal forms, steel deck tabs, steel roof decks, ducts, pipes, or conduit.
  - 2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 3. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
  - 5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 6. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches from ends of each member.
- E. Install edge moldings and trim at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.



- F. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- G. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
  - 1. Paint cut panel edges remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
  - 2. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.
  - 3. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

**END OF SECTION 09511**

**SECTION 09681 - CARPET TILE**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes carpet tile and installation.
- B. Carpet tile will be provided by owner and installed by contractor.

**1.2 SUBMITTALS**

- A. Product Data: For each product indicated.
- B. Maintenance data.

**1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with CRI 104, Section 5, "Storage and Handling."

**1.5 PROJECT CONDITIONS**

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not install carpet tile until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tile over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tile, install carpet tile before installing these items.

**1.6 WARRANTY**

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace carpet tile that does not comply with requirements or that fails within **10** years from date of Substantial Completion.
  - 1. Warranty does not include deterioration or failure of carpet tile from unusual traffic, failure of substrate, vandalism, or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination.

## **1.7 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 1 box.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT**

- A. CARPET TILE - By owner (installed by Contractor)
  - 1) Carpet Tile (12" x 36")
  - 2) 'Half Lap' Installation

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Comply with CRI 104, Section 13, "Carpet Modules (Tiles)."
- B. See details for edges on Sheet A906

**END OF SECTION 09681**

**SECTION 09911 - PAINTING**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

**1.2 SUBMITTALS**

- A. Product Data: For each product indicated.
- B. Samples: For each type of finish-coat material indicated.

**1.3 QUALITY ASSURANCE**

- A. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5.
  - 1. Wall Surfaces: Provide samples on at least 100 sq. ft. (9 sq. m).
  - 2. Small Areas and Items: Architect will designate items or areas required.
  - 3. Final approval of colors will be from benchmark samples.

**1.4 PROJECT CONDITIONS**

- A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.
- B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
- C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).
- D. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

**1.5 EXTRA MATERIALS**

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.

1. Quantity: 5-percent, but not less than 1 gal. (3.8 L) or 1 case, as appropriate, of each material and color applied.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
- C. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
  1. (Paint) Sherwin-William Co (Sherwin-Williams)
  2. (Stain – Behr)

### **2.2 PAINT MATERIALS, GENERAL**

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Colors: As indicated by manufacturer's designations.

### **2.3 PREPARATORY COATS**

- A. Interior Primer: Interior latex-based or alkyd primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.
  1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.
  2. Zinc-Coated Metal Substrates: Galvanized metal primer.
  3. Where manufacturer does not recommend a separate primer formulation on substrate indicated, use paint specified for finish coat.

### **2.4 EXTERIOR FINISH COATS**

- A. Powder coat all exterior metal as noted on drawings

- B. Exterior Metal Surfaces – Ferrous (that is not indicated to be powder coated)
  - 1. Primer: Benjamin Moore, IMC DTM Alkyd Primer (M24)
  - 2. Paint: Benjamin Moore, 2 coats, IMC DTM Alkyd Semi-glos (M24)
  - 3. Color: See architectural drawings
- C. Exterior Galvanized Metal Surfaces (that is not indicated to be powder coated)
  - 1. Primer Valspar Alkyd Galvanized Metal Primer
  - 2. Paint Benjamin Moore, 2 coats, IMC DTM Alkyd Semi-gloss (M24)

## **2.5 INTERIOR FINISH COATS**

- A. Interior Flat Latex-Emulsion Size (Gyp. Bd. Ceilings) :
  - 1. Benjamin Moore; Colorscapes Interior Latex Flat No. 515.
  - 2. Pittsburgh Paints; 6-700 Series SpeedHide Ultra Interior Flat Latex 100 Percent Acrylic.
  - 3. Sherwin-Williams; SuperPaint Flat Wall Paint A86 Series.
- B. Interior Low-Luster Acrylic (gyp bd. walls):
  - 1. Benjamin Moore; Moore's Regal AquaVelvet No. 319.
  - 2. Pittsburgh Paints; 89-Line Manor Hall Interior Eggshell Wall and Trim.
  - 3. Sherwin-Williams; SuperPaint Interior Latex Satin Wall Paint A87 Series.
- C. Interior Semigloss Alkyd Enamel (epoxy): Located in Kitchen ceilings.
  - 1. Benjamin Moore; Satin Impervo Alkyd Low Lustre Enamel No. 235.
  - 2. Pittsburgh Paints; 27 Line Wallhide Low Odor Interior Enamel Wall and Trim Semi-Gloss Oil.
  - 3. Sherwin-Williams; Classic 99 Interior Alkyd Semi-Gloss Enamel A-40 Series.

## **2.6 INTERIOR WOOD STAINS AND VARNISHES**

- A. Open-Grain Wood Filler:
  - 1. Benjamin Moore; Benwood Paste Wood Filler No. 238.
  - 2. Pittsburgh Paints; none required.
  - 3. Sherwin-Williams; Sher-Wood Fast-Dry Filler.
  - 4. Sherwin-Williams; none recommended.
- B. Interior Wood Stain:
  - 1. To be provided by Owner through Furniture Fabricator
- C. Clear Sanding Sealer: Fast-drying alkyd based.
  - 1. Benjamin Moore; Moore's Interior Wood Finishes Quick-Dry Sanding Sealer No. 413.
  - 2. Pittsburgh Paints; 6-10 SpeedHide Quick-Drying Interior Sanding Wood Sealer and Finish.
  - 3. Sherwin-Williams; Wood Classics Fast Dry Sanding Sealer B26V43.

- D. Interior transparent stain satin wood finish:
  - 1. Sikkens: Cetol UV Interior, Clear, Acrylic, Sheen: Satin
- E. Interior varnish: Flame Control No. 133A, Water base, fire retardant polyurethane varnish, with a semi-gloss sheen for all interior wood surfaces. Flame control No 133A is a fire retardant polyurethane varnish, fire hazard classification, class "B" by flame control coatings Provide sample for owner's approval.
- F. Exterior Semi-Transparent Stain (delivery area)
  - 1. Behr Premium, Semi-Transparent Waterproofing All-In One Wood Stain and Sealer (see exterior finishes A201, A202 and A902)
  - 2. Prepare wood per manufacturer's direction

### **PART 3 - EXECUTION**

#### **3.1 APPLICATION**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- D. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and reprime.
  - 2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
  - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

- b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
    - c. If transparent finish is required, backprime with spar varnish.
    - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
    - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
  - 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
    - a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
    - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
    - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
  - 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- E. Material Preparation:
- 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
- F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convactor covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
- 1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  - 3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 4. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  - 5. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
- G. Sand lightly between each succeeding enamel or varnish coat.



- H. **Scheduling Painting:** Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Omit primer over metal surfaces that have been shop primed and touchup painted.
  - 2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
- I. **Application Procedures:** Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
- J. **Minimum Coating Thickness:** Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.
- K. **Mechanical and Electrical Work:** Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- L. **Block Fillers:** Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- M. **Prime Coats:** Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- N. **Pigmented (Opaque) Finishes:** Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- O. **Transparent (Clear) Finishes:** Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

### **3.2 CLEANING AND PROTECTING**

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
- B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### **3.3 INTERIOR PAINT SCHEDULE**

**A. Gypsum Board:**

1. Acrylic Finish: Two finish coats over a primer.
  - a. Primer: Interior gypsum board primer.
  - b. Finish Coats: Interior flat latex paint
    - 1) Location: Ceiling and wall above ceiling
  - c. Finish Coats: Interior satin latex paint on wall below ceiling.

**B. Ferrous Metal:**

1. Alkyd-Enamel Finish: Two finish coats over a primer.
  - a. Primer: Interior ferrous-metal primer.
  - b. Finish Coats: Interior satin alkyd enamel.

**C. Zinc-Coated Metal:**

1. Alkyd-Enamel Finish: Two finish coats over a primer.
  - a. Primer: Interior zinc-coated metal primer.
  - b. Finish Coats: Interior satin alkyd enamel.

**D. All-Service Jacket over Insulation:**

1. Acrylic Finish: Two finish coats. Add fungicidal agent to render fabric mildew proof.
  - a. Finish Coats: Interior flat latex-emulsion size.

### **3.4 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE**

- A. Stain-Varnish Finish: As directed by manufacturer's instructions..**

**END OF SECTION 09911**

## **SECTION 10050 – MISCELLANEOUS SPECIALTIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Interior Signage.
  - 2. Fire Extinguishers and Accessories.
  - 3. Exterior signage for Fire Riser Room and Building Address numbers.
- B. Provide miscellaneous specialty items as shown on the drawings and specified herein.
- C. Submittals: Submit product data and samples, where appropriate, for each type of specialty items required.

### **PART 2 – PRODUCTS**

#### **2.1 MATERIALS**

- A. Interior Signage: Plastic signs with raised pictograms and characters and Braille where required by the ADA; comply with applicable codes and ADA requirements. Exact size, type, color, format, and content of signs to be determined by the Architect. Preliminary list of signs as follows:
  - 1. Sign indicating building occupant load.
  - 2. Signs at all toilets with raised “men/women” pictogram and raised Braille “men/women” characters.
  - 3. Sign to read: “FIRE RISER ROOM” Re: Key Note AJ/A102
  - 4. “No Smoking” symbol sign to be located at each entrance (public and employee). 4 total
- B. Fire Extinguishers and Accessories:
  - 1. UL-Listed Products: Fire extinguishers shall be UL-Listed with UL-Listing mark for type, rating, and classification of extinguisher.
  - 2. Fire extinguishers shall be multi-purpose dry chemical type, stainless steel tank, 10 lb. Capacity with pressure gauge, UL-Approved for Class A, B and C fires, locations as indicated on drawings.
    - a. See sheet A102

- C. Exterior building address signage Re: Key Note #31 on sheet A201  
6" height x 1/2" thickness,  
font: Helvetica Bold,  
mounting: plain,  
color: brushed natural satin.

### **PART 3 – EXECUTION**

#### **3.1 INSTALLATION**

- A. Deliver rough-in blocking frames and other items to be built-in to construction during framing stages at appropriate times, not delaying the construction process. Provide templates and rough-in measurements as required.
- B. Provide reinforcements in walls for attachment and support of specialty items.
- C. Install specialty items in accordance with manufacturer's printed instructions, applicable codes, and as shown on drawings.
- D. Install true, plumb and level, securely and rigidly anchored to substrate.
- E. Use tamper-proof fasteners where needed.
- F. Adjust and clean specialty items after installation for proper operation.
- G. Mount items to be accessible per the "Americans with Disabilities Act Accessibility Guidelines", (ADAAG) as applicable.

**END OF SECTION 10050**

**SECTION 10200 – FIRE PIT INSERTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Fire Pit Insert
  - 1. Contractor is to provide and install burner insert in its entirety.

**1.2 SUBMITTALS**

- A. Submit under provisions of Section 01330.
  - a. Manufacturer's data sheets on each product to be used, including installation instructions.
- B. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- C. Operating and maintenance data.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.

**PART 2 PRODUCTS**

**2.1 MANUFACTURERS**

- A. The Outdoor Plus Co., Inc. 235 East Main Street, Ontario, CA 91762 909-460.5579  
Regional representative: Stellar Sales, 1237 Post Oak Court, Bartonville, Texas 76226  
940-455-2701 contact: Jamie Pittman

**2.2 MATERIALS**

- A. The Outdoor Plus Fire Pit insert burner assembly, (Automated) OPT-Custom (PROVIDE COMMERCIAL GRADE WITH CERTIFICATE)
  - 1. Input Voltage: 110 volt
  - 2. Gas Type: Natural Gas
  - 3. Gas Pressure: Nominal: 7" wc
  - 4. Gas Flow: one - 6'-0" single line burner
  - 5. See electrical drawings for additional electrical info including emergency gas shut off.
- B. Parts (Quantity: 1)
  - 1. OPT-CUSTOM, 84" X 6" rectangle flat pan with 72" linear stainless-steel burner, 110V Plug & Play Electronic Ignition, 120K BTU's – Natural Gas w/ one control panel.
  - 2. OPT-DTM – Electronic timer
  - 3. OPT-ETOP-WK – Emergency Shut Off with Key
  - 4. OPT-PL-50 – Polished Lava – 2" to 3" (sold in 50 lb quantity) provide 7 bags

- C. Accessories
  - 1. Contractor to provide support plate as shown on drawing

### **2.3 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.

### **2.4 INSTALLATION**

- A. Installation shall be performed by a licensed contractor. All aspects of installation must conform to local and national codes.
- B. **Contractor to have a scheduled meeting with Jamie Pittman of Stellar Sales, (940-455-2701) prior to beginning construction of Fire Pit to coordinate work and once more during construction of Fire Pit to verify work is being completed correctly.**
- C. Adjust for proper operation.

### **2.5 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products and finishes before Substantial Completion.

**END OF SECTION 10200**

**SECTION 10250 – SLOAN WASH BASIN & FIXTURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. OWNER will provide 2 – Sloan wash basin and fixtures, contractor to install and connect electrical and plumbing.

**PART 2 – PRODUCTS**

**1.1 MATERIALS**

Sloan - Model #AD-82.000 2 -Station Wash Basin, Plan 60.000”  
2CM Corian Quartz, Night Soap Stone Group 3  
Mounting Option – Angled Enclosure, ASTM A36 Steel, Black Powder Coat BK05  
Front Option – Magnet Hold Open, Stainless Steel, Brushed Finish – Horizontal Grain  
Left Panel – Finished End, Stainless Steel, Brushed Finish – Horizontal Grain  
Right Panel – Finished End, Stainless Steel, Brushed Finish – Horizontal Grain  
Faucet – Model: EFX-200, Finish: Chrome Polished  
Soap – Model: ESD-400, Finish: Chrome Polished  
Dryer – Model: ED-510, Finish: Chrome Polished  
Integral Tempering Valve – ST70 Acorn.eng  
See architectural drawings for locations of fixtures

**2.1 INSTALLATION**

- A. Deliver rough-in blocking frames and other items to be built-in to construction during framing stages at appropriate times, not delaying the construction process. Provide templates and rough-in measurements as required.
- B. Provide reinforcements in walls for attachment and support of specialty items.
- C. Install specialty items in accordance with manufacturer’s printed instructions, applicable codes, and as shown on drawings.
- D. Install true, plumb and level, securely and rigidly anchored to substrate.
- E. Use tamper-proof fasteners where needed.
- F. Adjust and clean specialty items after installation for proper operation.

**END OF SECTION 10250**

**SECTION 10711 - EXTERIOR SUN CONTROL DEVICES**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Exterior sun control devices.

**1.2 REFERENCES**

- A. AAMA 2604 – High Performance Organic Coatings on Architectural Extrusions and Panels.
- B. AAMA 2605 – High Performance Organic Coatings on Architectural Extrusions and Panels.
- C. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.
- D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings
- H. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.
- I. ASTM D2244 - Standard Test Method for Calculation of Color Differences From Instrumentally Measured Color Coordinates.
- J. USGBC: U.S. Green Building Council LEED Rating System.

**1.3 ACTION SUBMITTALS**

- A. Submit under provisions of Section 01330.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Indicate adaptation of manufacturer's standard sunshade system to Project; system elevations, and dimensions, structural support requirements and tolerances, profiles of members, anticipated deflection underload and details.
- D. Samples: For each finished product specified, submit samples to show sunshade components, fasteners, accessories, finish, and color.



#### **1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For exterior sun control devices to include maintenance manuals.

#### **1.5 QUALITY ASSURANCE**

- A. Obtain sunshade systems from one source, from a single manufacturer.
- B. Sunshade systems shall be manufactured by a firm with a minimum of 5 years of experience in the design, engineering and fabrication of similar systems. Alternate manufacturers shall submit evidence of sufficient expertise and experience no less than 10 days prior to bid date. If such manufacturers are judged acceptable, they will be identified by addendum prior to bid date. No other form of approval shall be acceptable.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finishes during handling and installation to prevent damage.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### **1.7 PROJECT CONDITIONS**

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Installer shall verify actual measurements/connections by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

#### **1.8 WARRANTY**

- A. Manufacturer shall provide standard limited warranty for sunshade systems for a period of five years (60 months) from date of installation, no more than 60 months after shipment from the manufacturing plant. When notified in writing from the Owner of a manufacturing defect, manufacturer shall promptly correct deficiencies without cost to the Owner.
- B. Manufacturer shall provide 20 year limited warranty for fluoropolymer-based finish on extruded aluminum substrates.
  - 1. Finish coating shall not peel, blister, chip, crack or check.
  - 2. Chalking, fading or erosion of finish when measured by the following tests:
    - a. Finish coating shall not chalk in excess of 8 numerical ratings when measured in accordance with ASTM D4214.
    - b. Finish coating shall not change color or fade in excess of 5 NBS units as determined by ASTM D2244 and ASTM D822.

- c. Will not change or fade more than (5) Delta-E Hunter units as determined by ASTM method D-2244
  - d. Will not chalk in excess of ASTM D-4214-07 number (8) rating, determined by the procedure outlined in ASTM D-4214-07 specification test.
- 3. AAMA (American Architectural Manufacturers Association) publication number 609 and 610-09 ("Cleaning and Maintenance Guide for Architecturally Finished Aluminum"). \

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Acceptable Manufacturer: Ruskin Company; 3900 Dr. Greaves Rd., Grandview, MO 64030.  
Tel: (816) 761-7476.  
Contact: Erik McDade, Day Company, Ruskin Sales Representative 816-9887783  
ericmcdade@jddaycompany.com
- B. Requests for substitutions will be considered.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Sunshades shall be factory engineered to withstand wind loads, acting inwards and outwards.
  - 1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction.
- B. Sunshades shall be factory engineered to dead and live gravity loads,
  - 1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction.
- C. Sunshades shall be factory engineered to withstand the specified seismic loads.
  - 1. Minimum design loads shall be calculated to comply with ASCE – 7, or local requirements of Authority Having Jurisdiction.
- D. Sunshades shall be factory engineered to withstand the thermal stress to which the sunshades will be subjected.
  - 1. Base engineering on a surface design temperature change of 180 degrees F (82 degrees C).

### **2.3 DESIGN**

- A. Refer to Drawings for application, design and details.
  - 1. Design is based on Exterior Sun Control Devices as manufactured by Ruskin Company.
- B. Pre-engineered application:
  - 1. Horizontal cantilever.

### **2.4 COMPONENTS**

- A. Blade Design: 6063T6 alloy extruded aluminum.
  - 1. Louver Blade: 4 inches (102 mm to 203 mm).
- B. Outrigger Profile: Size as indicated on Drawings.
  - 1. Flat Bar.
- C. Intermediate Outrigger:

## **2.5 PRE-ENGINEERED DESIGN - SUN SHADE BLADE HORIZONTAL**

- A. Refer to Drawings for application, design and details.
  - 1. Design based on Model SSLBH (Sunshade Blade Horizontal) as manufactured by Ruskin Company.
- B. Pre-engineered application:
  - 1. Horizontal cantilever.
- C. Components:
  - 1. Blade Design: 6063T6 alloy extruded aluminum.
    - a. Louver blade, horizontally mounted, SSLBH4, 4-inch (102 mm) blade width.
      - 1) 0.125 inch (3.2 mm) nominal thickness, installed at 45 degree angle.
  - 2. Fascia Profile: Size as indicated on Drawings.
    - a. Channel.
  - 3. Outrigger Profile: Size as indicated on Drawings.
    - a. Straight.

## **2.6 BRACKETS**

- A. Installation Bracket: Bolted Connection to Steel.
- B. Installation Bracket: Bolted through Wood Connection.

## **2.7 FABRICATION**

- A. The intermediate outriggers shall have a very closely milled blade shape cut through the intermediate outrigger to support longer runs of the blade than the recommended unsupported distance.
  - 1. A design using individual blade sections between outriggers and secured by exposed fasteners is not permitted.
- B. Mitered Corners: Fascia and blades shall be precision cut mitered with intermediate outrigger design incorporated.
- C. Segmented Sunshade:

## **2.8 FINISHES**

- A. Standard mill finish.

- B. 50 percent Fluoropolymer-Based Painted Finishes: Finish shall be applied at 1.2 mil total dry film thickness.
  - 1. Coating shall conform to AAMA 2604, sections 4.2 and 4.3. Apply coating following cleaning and pretreatment. Cleaning: AA-C12C42R1X.
  - 2. Baked Enamel (50 % PVDF).
- C. Prime Coat:
  - 1. Apply alkyd prime coat following chemical cleaning and pretreatment.
  - 2. Primer preparation for field painting.
- D. Color for Fluoropolymer Coating:
  - 1. Color: Manufacturer's standard Dark Bronze in paint system specified.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.2 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Apply field topcoat within 6 months of application of shop prime coat. Apply field topcoat as specified in Section 09911.

#### **3.4 PROTECTION**

- A. Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION 10711**

## **SECTION 10801 - TOILET AND BATH ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Toilet and bath accessories.
  - 2. Infant-care products.

#### **1.3 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, gages, thickness, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- B. Samples: For each accessory item to verify design, operation, and finish requirements.
- C. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instruction, and directions for preparing cutouts and installing anchoring devices.
- D. Product Schedule: Indicating types, quantities, sizes and installation locations by room of each accessory required. Use designations indicated in the Toilet Accessory Schedule and room designations as indicated on the drawings in product schedule.
- E. Maintenance Data: for accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and services recommendations.

#### **1.4 QUALITY ASSURANCE**

- A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.
- B. Inserts and Anchorage: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
- C. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

- D. Product Options: Specific products indicated in the Toilet Accessory Schedule establish Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance.
  - 1. Products of other manufactures with equal characteristics, as judged solely by Architect, may be provided.
  - 2. Do not modify aesthetic effects, except with Architect's written approval. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

## **1.5 COORDINATION**

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

## **1.6 WARRANTY**

- A. Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within warranty period.
- B. General Warranty: special warranty specified in this Article shall not deprive Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
  - 1. Minimum Warranty Period: One year for date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Toilet and Bath Accessories:
    - a. Bobrick Washroom Equipment, Inc. – NO SUBSTITUTIONS
    - b. Soap Dispensers – Impact Products, Inc. – contact: Walt Rogers, Prime Market, 816-471-2524 shown in Employee's Toilet
    - c. See Sheets A501 & A502 for schedule
  - 2. Infant-Care Products:
    - a. Koala Corporation. – NO SUBSTITUTIONS

## **2.2 MATERIALS**

- A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- C. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- D. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and galvanized steel when concealed.
- E. Keys: Provide universal keys for internal access to accessories for servicing and re-supplying. Provide minimum of 6 keys to Owner's representative.

## **2.3 FABRICATION**

- A. General: Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
  - 1. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.
- B. Adjust accessories for unencumbered, smooth operation and verify that mechanism function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

### **3.2 ADJUSTING AND CLEANING**

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanism function properly. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.

- C. Clean and polish exposed surfaces according to manufacturers written recommendations.

**3.3 TOILET ACCESSORY SCHEDULE – See Sheets A501 & A502**

**END OF SECTION 10801**