

MAYNARD STREET PARKING STRUCTURE OFFICES
324 MAYNARD STREET
ANN ARBOR, MICHIGAN 48104

Damian Farrell Design Group, PLLC
359 Metty Drive, Suite #4A
Ann Arbor, Michigan 48103
(734) 998-1331



February 27, 2019

[THIS PAGE INTENTIONALLY LEFT BLANK]

PROJECT DIRECTORY

Project: Maynard Street Parking Structure Offices
324 Maynard Street
Ann Arbor, Michigan 48104

Owner: Ann Arbor Downtown Development Authority
150 S Fifth Avenue
Ann Arbor, Michigan 48104
Tel: 734.994.6697
Contact: Jada Hahlbrook

Architect: Damian Farrell Design Group PLLC
359 Metty Drive, Suite 4A
Ann Arbor, Michigan 48103
Tel: 734.998.1331
Contact: Tresna Taylor

Contractor: TBD
Address
City, ST Zip
Tel:
Contact:

Mechanical, Electrical, &
Plumbing Engineer: JRED Engineering Inc.
14137 Farmington Road
Livonia, MI 48154
Tel: 734.855.4904
Contact: Esteban Cabello

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 00 01 10

TABLE OF CONTENTS

DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 01	Project Title Page
00 01 03	Project Directory
00 01 10	Table of Contents
00 11 13	Invitation for Bids
00 21 13	Instructions to Bidders
00 41 00	Bid Form
00 43 00	Bid Form Supplements
00 72 00	General Conditions
00 73 00	Supplementary Conditions

DIVISION 01 GENERAL REQUIREMENTS

01 11 00	Summary of Work
01 21 00	Allowances
01 23 00	Alternates
01 25 00	Substitution Procedures
01 25 19	Substitution Request Form
01 26 00	Contract Modification Procedures
01 26 13	Requests for Information
01 29 00	Payment Procedures
01 30 00	Administrative Requirements
01 31 00	Project Management and Coordination
01 32 16	Construction Progress Schedule
01 33 00	Submittal Procedures
01 35 16	Alteration Project Procedures
01 35 46	Indoor Air Quality Management
01 40 00	Quality Requirements
01 50 00	Temporary Facilities and Controls
01 56 00	Temporary Jobsite Protection
01 60 00	Product Requirements
01 73 29	Cutting and Patching
01 74 19	Construction Waste Management
01 77 00	Closeout Procedures

DIVISION 02 EXISTING CONDITIONS

02 41 19	Selective Demolition
----------	----------------------

DIVISION 03 CONCRETE

03 30 00	Cast-In-Place Concrete
----------	------------------------

DIVISION 04	MASONRY
04 20 00	Unit Masonry
DIVISION 05	METALS
05 40 00	Cold-Formed Metal Framing
DIVISION 06	WOOD, PLASTICS, AND COMPOSITES
06 10 00	Rough Carpentry
06 16 00	Sheathing
06 20 00	Finish Carpentry
06 41 00	Architectural Wood Casework
06 46 00	Wood Trim
06 61 16	Solid Surfacing Fabrications
DIVISION 07	THERMAL AND MOISTURE PROTECTION
07 10 00	Dampproofing and Waterproofing
07 21 13	Board Insulation
07 21 16	Blanket Insulation
07 28 00	Moisture Barriers
07 42 13	Aluminum Metal Plate Wall Panels
07 62 00	Sheet Metal Flashing and Trim
07 92 00	Joint Sealers
DIVISION 08	OPENINGS
08 11 13	Hollow Metal Doors and Frames
08 41 13	Aluminum Framed Entrances & Storefronts
08 71 00	Door Hardware
08 80 00	Glazing
DIVISION 09	FINISHES
09 21 16	Non-Structural Metal Framing
09 29 00	Gypsum Board
09 29 40	Gypsum Vinyl Trim and Accessories
09 30 00	Tiling
09 51 13	Acoustical Ceilings
09 65 13	Resilient Base
09 65 19	Resilient Tile Flooring
09 68 13	Tile Carpeting
09 72 00	Wall Coverings
09 91 00	Painting

DIVISION 10	SPECIALTIES
10 28 13	Toilet Accessories
DIVISION 11	EQUIPMENT
	No Sections Issued
DIVISION 12	FURNISHINGS
	No Sections Issued
DIVISION 13	SPECIAL CONSTRUCTION
	No Sections Issued
DIVISION 14	CONVEYING DEVICES
	No Sections Issued
DIVISION 22	PLUMBING
	See Drawings for Specifications
DIVISION 23	MECHANICAL
	See Drawings for Specifications
DIVISION 26	ELECTRICAL
	See Drawings for Specifications
DIVISION 31	EARTHWORK
31 23 00	Excavation and Fill
31 40 00	Underpinning
DIVISION 32	SITE IMPROVEMENTS
32 71 13	Vehicle Barriers
APPENDICES	PRODUCT CUTSHEETS
Appendix A	Product Cut-sheets
	END OF SECTION

[THIS PAGE LEFT INTENTIONALLY BLANK]

SECTION 00 11 13

INVITATION FOR BIDS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. The Owner of this Project is:
Ann Arbor Downtown Development Authority
150 S Fifth Avenue
Ann Arbor, Michigan 48104
- B. The Architect for this Project is:
Damian Farrell Design Group PLLC
359 Metty Drive, Suite 4A
Ann Arbor, Michigan 48103
- C. General Contractors are invited to submit bids for the construction of Maynard Street Parking Structure Offices located at 324 Maynard Street, Ann Arbor, Michigan 48104.
- D. The Work of this project is generally described as:
The expansion and interior renovation of existing offices in the Maynard Street Parking Structure in Ann Arbor, Michigan.
- E. Bids must be on a stipulated sum basis.
- F. The Architect will receive bids digitally until **5:00 p.m. local time, Wednesday, March 20, 2019**. Please submit original wet-signed bids to the architect following the digital submission. These original documents should be delivered to the architect by Monday March 25, 2019.
- G. Bids will be reviewed privately after the digital due date time.
- H. Bidders are required to state the number of days required to achieve Substantial Completion of the Work.
- I. A Bid Security is not required.
- J. Bids are required to be submitted under a condition of irrevocability for a period of 45 days after submittal.
- K. Submit Bids on the form provided, 00 41 00 - BID FORM.
- L. Bidders are required to submit Document 00 43 00 – BID FORM SUPPLEMENTS at the time Bids are submitted.
- M. At the time Bidding Documents are issued, Bidders shall submit an executed copy of *AIA Document A305, Contractor's Qualification Statement*, latest edition.
- N. Refer to Document 00 21 13 – INSTRUCTIONS TO BIDDERS for additional information.

1.2 BIDDING DOCUMENTS

- A. Bidding documents will be distributed electronically. Bidders may obtain up to 1 hardcopy set of Bidding Documents from the office of the Architect free of charge by request. The Architect will notify the bidders when Bidding Documents will be ready for pick up.
- B. Bidders desiring more than 1 set of Bidding Documents will be required to purchase those additional sets requested at cost of reproduction.
- C. Bidding Documents will not be issued directly to sub bidders.
- D. Bidding Documents may be examined at the office of the Architect at the address listed above.

1.3 EXAMINATION OF SITE

- A. An examination of the site has been arranged for Bidders and sub bidders during the Pre-Bid conference meeting.
- B. Examination of the site after the Pre-Bid conference may be arranged with the Owner's representative.

1.4 PRE BID CONFERENCE

- A. A pre bid conference has been scheduled for **2:00 pm** local time, **Monday, March 4, 2019** at 324 Maynard Street, Ann Arbor, Michigan 48104.
- B. Bidders and sub bidders are invited to attend.
- C. Representatives of the Owner and Architect will be in attendance.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 DOCUMENT

- A. American Institute of Architects Document A701-1997, Instructions to Bidders, forms a part of the Bidding Documents and by reference is incorporated herein as fully as if repeated at length.

1.2 RELATED REQUIREMENTS

- A. Section 00 11 13 – Invitation for Bids.

1.3 SUPPLEMENTS

- A. The following supplements modify, delete from, or add to the Instructions to Bidders referenced above.
- B. Where provisions of the Instructions to Bidders are modified, unaltered provisions remain in effect.
- C. Article 3 - Bidding Documents:
 - 1. In Subparagraph 3.2.2, change “seven days” to read “three (3) days.”
 - 2. Delete Subparagraph 3.3.2; substitute the following:
 - a. 3.3.2 - Substitutions will not be considered prior to award of Contract. Refer to Section 01 60 00 - Product Requirements for Additional Information.
 - 3. Delete Subparagraphs 3.3.3 and 3.3.4.
- D. Article 4 - Bidding Procedures:
 - 1. Add Subparagraph 4.1.8:
 - 2. 4.1.8 - Identify the time of completion on the Bid Form. The date of Substantial Completion in the Owner/Contractor Agreement shall be the time of completion added to the commencement date.
- E. Article 5 - Consideration of Bids:
 - 1. Add the following to Subparagraph 5.2.1:
 - a. 5.2.1 - The Owner shall have the right to disqualify any Bidder who fails to satisfy the Owner that he is qualified to complete the Work.
 - 2. Delete Subparagraph 5.3.1; substitute the following:
 - a. 5.3.1 - The owner reserves the right to award the contract to other than the lowest qualified Bidder if multiple Bids do not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner’s judgement, is in the Owner’s best interest.
 - 3. Add Subparagraph 5.3.3:

- a. 5.3.3 - The Owner requires that work of this contract be completed as quickly as possible. Consideration will be given to the time of completion when reviewing the Bids submitted.

F. Article 8 - Form of Agreement Between Owner and Contractor:

1. The Agreement for the Work will be written on AIA Document A102-2007 Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 00 41 00

BID FORM

DATE _____, 20____

PROJECT Maynard Street Parking Structure Offices

PROPOSAL OF _____

hereinafter called "Bidder", a (corporation) (partnership) (sole proprietorship)
(Bidder strike out inapplicable terms)

TO Ann Arbor Downtown Development Authority (hereinafter called "Owner")

The undersigned, in compliance with your Invitation for Bids, submits the following Bid.

1.1 REPRESENTATIONS

- A. Bidder will accept the provisions of the Bidding Documents.
- B. Bidder will enter into and execute a contract with the Owner within 10 days after notification of the acceptance of this Bid.
- C. Bidder will accomplish the Work in accordance with the Bidding Documents prepared by Damian Farrell Design Group PLLC.

1.2 TIME OF COMPLETION

- A. Bidder will achieve Substantial Completion of the Work within the following calendar days after a Notice to Proceed is issued:

Days (_____)

1.3 BID AMOUNTS

- A. BASE BID: The undersigned proposes to complete all work as required per the Specifications, for a lump sum of:

_____ Dollars (\$_____)

- B. ALTERNATE BIDS: If the Alternates listed below and further described in Section 012300 - Alternates are accepted, the Base Bid Amount stated above shall be modified by the following amounts:

1. Alternate No. 1: Phasing of Construction – Two Phases

(Add) (Deduct) (Bidder strike one): Dollars (\$_____)

TAXES, PERMITS, BONDS AND FEES: Bid Sum Includes all Applicable Michigan taxes, permits, bonds, and fees, required by all legal authorities at the location of the Work.

ADDENDA: The following addenda have been received, are hereby acknowledged, and their execution is included in bid sums listed herein.

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

REQUEST FOR INFORMATION (RFI): The following RFI's have been received, are hereby acknowledged, and their execution is included in bid sums listed herein.

RFI's No. _____ Dated: _____

RFI's No. _____ Dated: _____

RFI's No. _____ Dated: _____

RFI's No. _____ Dated: _____

Company/Corporation_____
Signature_____
Date_____
Michigan License Class and Number_____
Signature

END OF SECTION

SECTION 00 43 00

BID FORM SUPPLEMENTS

DATE: _____, 20____

PROJECTS: Maynard Street Parking Structure Offices

**SUPPLEMENT TO
PROPOSAL OF:**

TO: Ann Arbor Downtown Development Authority
(hereinafter called "Owner")

The undersigned, in compliance with your Invitation for Bids, submits the Supplements to the Bid Form listed below. The information provided shall be considered as an integral part of the Bid Form previously submitted.

These Appendices are as follows:

1. Proposed Subcontractors: Includes the names of Subcontractors and the portions of the Work they will perform.
2. Base Bid Amount Breakdown: Identifies the cost breakdown of the previously submitted Base Bid amount into the portions of the Work requested.
3. Unit Prices: Identifies prices to be used as the basis for additions to or deductions from the Contract Sum as described in Section 01 22 00 - Unit Prices.

Respectfully submitted:

Firm Name: _____

Name of Officer: _____

Signature of Officer: _____

PROPOSED SUBCONTRACTORS

Bidder proposes to use the following Subcontractors for the portions of the Work indicated.

	SPECIFICATION SECTION	SUBCONTRACTOR NAME	FEE
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

BASE BID AMOUNT BREAKDOWN

The following is a breakdown of the Base Bid Amount into amounts attributable to the portions of the Work indicated. Contractor's overhead and profit shall be included as a separate line item.

CATEGORY	DESCRIPTION	VALUE
DIVISION 1	General	N/A
DIVISION 2	Selective Demolition	\$
DIVISION 3	Concrete	\$
DIVISION 4	Masonry	\$
DIVISION 5	Metals	\$
DIVISION 6	Wood, Plastic, and Composites	\$
DIVISION 7	Thermal and Moisture Protection	\$
DIVISION 8	Openings	\$
DIVISION 9	Finishes	\$
DIVISION 10	Specialties	\$
DIVISION 22	Plumbing	\$
DIVISION 23	Mechanical	\$
DIVISION 26	Electrical	\$
DIVISION 32	Site Improvements	\$
	Contractor's Overhead and Profit	\$
	TOTAL BASE BID AMOUNT	\$

END OF SECTION

SECTION 00 72 00

GENERAL CONDITIONS

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:

1. Document 007300 - Supplementary Conditions.
2. Division 01 - General Requirements.

1.2 DOCUMENT

- A. American Institute of Architects (AIA) Document A201-2007, General Conditions of the Contract for Construction, forms a part of this Contract and by reference is incorporated herein as fully as if repeated at length.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

DOCUMENT 00 73 00

SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:

1. Document 007200 - General Conditions.
2. Division 01 - General Requirements.

1.2 GENERAL

- A. The following supplements modify, delete from, or add to the General Conditions referenced above.
- B. Where provisions of the General Conditions are modified, unaltered provisions remain in effect.

1.3 SUPPLEMENTS

A. Article 1 - General Provisions:

1. Add Subparagraph 1.1.9:
 - a. 1.1.9 - The term "product" includes materials, systems, and equipment.
2. Add Subparagraph 1.1.10:
 - a. 1.1.10 - The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, erection, placement or similar requirements.
3. Add Subparagraph 1.1.11:
 - a. 1.1.11 - The term "install" means to unload, unpack, assemble, erect, place, finish, protect, adjust, and clean, or similar requirements.
4. Add Subparagraph 1.1.12:
 - a. 1.1.12 - The term "provide" means to furnish and install.

B. Article 9 - Payments and Completion:

1. Add Subparagraph 9.6.8:
 - a. 9.6.8 - Until final payment, the Owner will retain 5 percent of the amount due the Contractor on account of progress payments.

C. Article 10 - Protection of Persons and Property:

1. Add Paragraph 10.3.7:
 - a. 10.3.7 - The Contractor shall not knowingly use any materials containing asbestos or other known hazardous materials in the Work.

D. Article 11 - Insurance and Bonds:

1. In Subparagraph 11.1.1, following the word "located", add "and against whom the Owner has no reasonable objection."
2. Add the following to the end of Subparagraph 11.1.3:
 - a. "The form of the Certificate of Insurance shall be acceptable to the Owner."
3. Add Subparagraph 11.1.5:
 - a. 11.1.5 - Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:
 - Premises Operations including X, C and U coverages as applicable.
 - Independent Contractors' Protective.
 - Products and Completed Operations.
 - Personal Injury Liability with Employment Exclusion deleted.
 - Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
 - Owned, non owned and hired motor vehicles.
 - Broad Form Property Damage including Completed Operations.
4. Add Subparagraph 11.1.6:
 - a. 11.1.6 - The insurance required by Subparagraph 11.1.1 shall be written for not less than the limits proposed by the Contractor and approved by the Owner, or those required by law, whichever is greater.
5. Delete Subparagraph 11.4.1; substitute the following:
 - a. 11.4.1 - Furnish to Owner performance bond and labor and material payment bond, each equal to the amount of the Contract Sum, with approved surety, covering faithful performance of Contract and payment of obligations incurred in performance of Contract and also for use and benefit of parties who may become entitled to liens under the Contract according to provisions of laws of the State in which the project is located. The form of the bonds shall be acceptable to Owner.
 - The Contractor shall deliver the required bonds to the Owner not later than three days following the date of execution of the Owner Contractor Agreement, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.
 - The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

E. Article 13 – Miscellaneous Provisions:

1. Add Paragraph 13.8:

- a. 13.8 - Equal Opportunity
- b. 13.8.1 - The Contractor and Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, sexual orientation, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, sexual orientation, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.
- c. 13.8.2 - The Contractor and Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, sexual orientation, or national origin.

F. Article 15 – Claims and Disputes:

1. Add Paragraph 15.1.5.3:

- a. 15.1.5.3 - Extensions of time because of inclement weather will be granted only for the following conditions at the site:
 - Precipitation, defined as 0.2 inch or more of rain, snow, or ice, exceeds the mean for that month as published by the National Oceanic and Atmospheric Administration for the closest reporting station to the Project.
 - Freezing weather, defined as a high daytime temperature of 32 degrees F or below, exceeds the mean for that month as published by the National Oceanic and Atmospheric Administration for the closest reporting station to the Project.
 - Sustained winds exceeding 30 MPH.
 - Mud.
 - Standing snow of 18 inches or more.
 - Claims shall be in whole or half day increments. If both precipitation and freezing weather exceed the norm for any given day, only one day will be counted.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project description.
 - 2. Work by others.
 - 3. Work sequence.
 - 4. Owner occupancy.
 - 5. Future work.
 - 6. Contractor's use of site and premises.
 - 7. Owner furnished products.

1.2 PROJECT DESCRIPTION

- A. Work consists of the expansion and interior renovation of existing offices in the parking structure located at 324 Maynard Street, Ann Arbor, Michigan 48104.
- B. Work includes general construction, plumbing, mechanical, and electrical.
- C. The Project will be constructed under a single prime contract.

1.3 WORK BY OTHERS

- A. Separate Contracts:
 - 1. The Owner may execute contracts for additional work at the site, that is excluded from the work of this Contract, and that includes:
 - a. Security Alarm System.
 - b. Information Technology Systems.
 - 2. Work under separate contract may be executed concurrently with or after work of this Contract.
 - 3. Cooperate with the Owner and separate contractors to accommodate this requirement.

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Contractor shall have complete use of site and premises for execution of the Work.
- B. Move any stored products under Contractor's control that interfere with the operations of the Owner or separate contractors.
- C. Assume full responsibility for protection and safekeeping of products under this Contract stored on site.
- D. Obtain and pay for use of any additional storage or work areas needed for operations.

- E. Do not interrupt building fire or life safety systems.
- F. Do not close or obstruct exits.
- G. Do not use or store hazardous or flammable materials on premises without Owner's approval; follow requirements of governing authorities having jurisdiction over the work.
- H. Prohibit smoking within interior spaces.

1.5 OWNER FURNISHED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver necessary Shop Drawings, Product Data, and Samples to Contractor.
 - 2. Arrange and pay for product delivery to site, in accordance with Progress Schedule.
 - 3. Deliver supplier's bill of materials to Contractor.
 - 4. Inspect deliveries jointly with Contractor.
 - 5. Submit claims for transportation damage.
 - 6. Arrange for replacement of damaged, defective, and missing items.
 - 7. Arrange for manufacturers' warranties, service, and inspections, as required.
- B. Contractor's Responsibilities:
 - 1. Designate delivery date for each product in Progress Schedule.
 - 2. Review Shop Drawings, Product Data, and Samples. Submit to Architect with notification of any discrepancies or problems anticipated in use of product.
 - 3. Receive and unload products at site.
 - 4. Promptly inspect products jointly with Owner; record shortages, damage, and defective items.
 - 5. Handle products at site, including uncrating and storage.
 - 6. Protect products from exposure to elements and from damage.
 - 7. Connect, adjust, and finish products, as stipulated in respective specification section.
 - 8. Repair or replace any items damaged by Contractor.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL1.1 SUMMARY

- A. Section Includes:
 - 1. Cash allowances.
- B. Related Sections
 - 1. Section 012900 - Payment Procedures.
 - 2. Section 013216 - Construction Progress Schedules.
 - 3. Individual specification sections.
- C. Include in Contract Sum cash allowances scheduled at end of Section and contingency allowance specified in this Section.
- D. Designate in Construction Progress Schedule specified in Section 013216 delivery dates for products under each allowance.
- E. Designate in Schedule of Values specified in Section 012900 quantities of materials specified under unit cost allowances.

1.2 CASH ALLOWANCES

- A. General:
 - 1. Purchase products under each allowance as directed by Architect.
 - 2. Amount of allowance includes:
 - a. Net cost of product, less any applicable trade discounts.
 - b. Delivery to site.
 - c. Applicable taxes.
 - d. Labor required under allowance, only when labor is specified to be included in allowance.
 - 3. In addition to amounts of allowances, include in Contract Sum, Contractor's costs for:
 - a. Handling at site, including unloading, uncrating, and storing.
 - b. Protection from elements and from damage.
 - c. Labor required for installation and finishing, except where installation is specified to be part of allowance.
 - d. Other expenses required to complete installation.
 - e. Overhead and profit.
- B. Selection of Products:
 - 1. Architect's Duties:
 - a. Consult with Contractor in consideration of products and suppliers.
 - b. Make selection; designate products to be used.
 - c. Prepare Change Orders.
 - 2. Contractor's Duties:
 - a. Assist Architect in determining:
 - 1) Supplier or installer, as applicable.
 - 2) Cost, delivered and unloaded at site.
 - b. Obtain proposals from suppliers when requested by Architect.
 - c. Notify Architect of any effect anticipated by selection of product or supplier under consideration on construction schedule or contract sum.

- d. On notification of selection, enter into purchase agreement with designated supplier.
- C. Delivery:
 - 1. Contractor's Duties:
 - a. Arrange for delivery and unloading.
 - b. Promptly inspect products for damage or defects.
 - c. Submit any claims for transportation damage.
- D. Installation: Comply with requirements of referenced specification section.
- E. Adjustment of Costs:
 - 1. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference.
 - 2. Amount of Change Order will recognize any changes in handling costs at site, labor, installation costs, overhead, profit, and other expenses caused by selection under allowance.
 - 3. For products specified under unit cost allowance, unit cost shall apply to quantity listed in Schedule of Values.
 - 4. Submit invoices or other data to substantiate quantity actually used.
 - 5. Submit any claims for additional costs at site or other expenses caused by selection under allowances, prior to execution of work. Failure to do so will constitute waiver of claims for additional costs.

PART 1 PRODUCTS

Not used

PART 2 EXECUTION

2.1 ALLOWANCE SCHEDULE

- A. Underpinning – Division 31:
 - 1. Include a cash allowance of \$15,000.00 for underpinning in area of existing Bike House.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Documentation of changes to Contract Sum and Contract Time.
- B. Contract Documents contain pertinent requirements for materials and methods to accomplish work described herein.
- C. Provide alternate costs for inclusion in Contract Sum if accepted by Owner.

1.2 RELATED REQUIREMENTS

- A. Owner/Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.
- B. Individual specification sections identified.

1.3 PROCEDURES

- A. Alternates will be exercised at the option of Owner.
- B. Coordinate related work and modify surrounding work as required to complete the work, including changes under each Alternate, when acceptance is designated in Owner/Contractor Agreement.

1.4 DESCRIPTION OF ALTERNATES

- A. Alternate No. 1 – Phasing of Construction:
 - 1. Base Bid: Demolition and construction of project in a single phase. Owner will temporarily operate off-site during construction.
 - 2. Alternate Bid: Demolition and construction in two phases to provide a functional Public Lobby and service counter for the Owner on site throughout construction.
 - Phase One: relocate IT Closet, remove Bike House, construction new offices, breakroom and restroom while Owner continues operation in the existing Front Office and Lobby.
 - Phase Two: renovate and expand existing Front Office and Lobby while the Owner operates temporarily in completed Phase One space.
 - Refer to architectural drawings on sheets ALT1.0 and ALT2.0 for phasing information.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Product Substitution Procedures.

1.2 GENERAL

- A. Definition: Proposal by Contractor to use manufacturer, product, material, or system different from one required in Contract Documents.
- B. Do not substitute Products unless a substitution request has been approved by Architect.
- C. Substitutions during Bidding: Refer to Instructions to Bidders.
- D. Architect will consider substitution requests within 30 days after award of Contract. After initial 30 day period, substitutions requests will be considered only due to non-availability of a specified Product through no fault of Contractor.
- E. In case of non-availability of a specified Product notify Architect in writing as soon as non-availability becomes apparent.

1.3 SUBSTITUTION REQUESTS

- A. Submit substitution requests on form provided by Architect.
- B. Document specified product and proposed substitution with complete data, including:
 - 1. Product identification, including name and address of manufacturer.
 - 2. Product description, performance and test data, and reference standards.
 - 3. Sample, if requested.
 - 4. Description of any anticipated effect that acceptance of proposed substitution will have on Progress Schedule, construction methods, or other items of Work.
 - 5. Description of any differences between specified product and proposed substitution.
 - 6. Difference in cost between specified product and proposed substitution.
- C. Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.
- D. A request constitutes a representation that the Contractor:
 - 1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - 2. Will provide the same warranty for the substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension that may subsequently become apparent.
 5. Will reimburse Owner for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the substitution.
- E. Substitutions will not be considered if:
1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.
 2. Approval will require substantial revision of Contract Documents without additional compensation to Architect.
- F. Submit one copy. Submit electronically in Adobe PDF format.
- G. Architect will notify Contractor of approval or rejection of each Substitution Request.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

DOCUMENT 01 25 19

SUBSTITUTION REQUEST FORM

DATE: _____

TO: Damian Farrell Design Group PLLC

ATTENTION: Tresna Taylor

PROJECT: Maynard Street Parking Structure Offices

We submit for your consideration the following product as a substitution for the specified product:

<u>SECTION NO.</u>	<u>PARAGRAPH</u>	<u>SPECIFIED PRODUCT</u>
_____	_____	_____

Proposed Substitution: _____

Reason for Substitution: _____

Product Data:

Attach complete technical data for both the specified product and the proposed substitution. Include information on changes to Contract Documents that the proposed substitution will require for its proper installation.

Samples:

_____ Attached _____ Will be furnished upon request

Does the substitution affect dimensions shown on Drawings?

_____ No _____ Yes (explain):

Effects of proposed substitution on other Work:

Differences between proposed substitution and specified Product:

Manufacturer's warranties of the proposed substitution are:

_____ Same _____ Different (explain):

Maintenance service and spare parts are available for proposed substitution from:

Previous installations where proposed substitution may be seen:

Project: _____ Project: _____

Owner: _____ Owner: _____

Architect: _____ Architect: _____

Date Installed: _____ Date Installed: _____

Cost savings to be realized by Owner, if proposed substitution is approved:

Change to Contract Time, if proposed substitution is approved:

_____ No Change / _____ Add _____ days / _____ Deduct _____ days

Submittal constitutes a representation that Contractor has read and agrees to the provisions of Section 01 25 00.

Submitted by Contractor:

Signature: _____

Firm: _____

For Use by Architect:

Based on the information supplied by the Contractor, the Architect has reviewed the proposed substitution on the basis of design concept of the Work and conformance with information given in Contract Documents.

_____ Approved

_____ Approved as Noted

_____ Rejected

Submit Additional Information:

By: _____ Date: _____

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Supplemental Instructions.
2. Proposal Requests.
3. Contractor proposed changes.
4. Construction Change Directives.
5. Change Orders.

B. Related Sections:

1. Section 01 60 00 - Product Requirements.

1.2 CHANGE PROCEDURES

A. Architect's Supplemental Instructions:

1. Format: AIA Document G710 - Architect's Supplemental Instructions.
2. Architect will advise of minor changes in Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract.

B. Proposal Requests:

1. Format: AIA Document G709 - Proposal Request.
2. Architect may issue a Proposal Request that includes a detailed description of a proposed change with supplemental or revised Drawings and specifications.
3. Prepare and submit an estimate of any change to Contract Sum or Contract Time within 7 days after receipt. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
4. Do not stop work or initiate changes in response to a Proposal Request. If approved, Architect will prepare and issue a Change Order.
5. Submit one copy. Submit electronically in Adobe PDF format.

C. Contractor Proposed Changes:

1. Format: Contractor's standard.
2. Contractor may propose a change by submitting request for change to Architect.

3. Describe proposed change, reason for change, its full effect on Work, and any change to Contract Sum or Contract Time. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
 4. Document any required substitutions in accordance with Section 016000.
 5. Submit one copy. Submit electronically in Adobe PDF format.
- D. Construction Change Directive:
1. Architect may issue a directive, signed by Owner, instructing Contractor to proceed with a change for subsequent inclusion in a Change Order.
 2. Documentation will describe changes in Work and designate method of determining any change to Contract Sum or Contract Time. Promptly execute change.
- E. Change Orders:
1. Format: AIA Document G701 - Change Order.
 2. Execution: Prepare Change Orders for signature of parties as provided in Conditions of the Contract.
 3. Submit one copy. Submit electronically in Adobe PDF format.
- PART 2 PRODUCTS
- Not used
- PART 3 EXECUTION
- Not used

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INFORMATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requests for Information (RFI's).
- B. Related Sections:
 - 1. Section 01 25 00 - Substitution Procedures.
 - 2. Section 01 26 00 - Contract Modification Procedures.
 - 3. Section 01 33 00 - Submittal Procedures.
 - 4. Section 01 77 00 - Closeout Procedures.

1.2 GENERAL

- A. Request for Information (RFI): Request from Contractor seeking interpretation or clarification of Contract Documents not involving Substitutions or changes to Contract Sum or Contract Time.
- B. RFI's constitute a request for information only.
- C. Do not submit RFI's:
 - 1. To request approval of Substitutions; refer to Section 01 25 00.
 - 2. To request changes known to include changes to Contract Sum or Contract Time; refer to Section 01 26 00.
 - 3. To request approval of submittals; refer to Section 01 33 00.
 - 4. To submit Project Record Documents; refer to Section 01 77 00.

1.3 SUBMITTAL

- A. Submit RFI's on Contractor's standard form.
- B. Include on each RFI:
 - 1. Name of Contractor.
 - 2. Project name.
 - 3. Date submitted.
 - 4. Sequential RFI number.
 - 5. Applicable Drawing sheet and detail numbers or Specification Section numbers.
 - 6. Date when response information is required to avoid impact on Construction Schedule and Construction Cost.
- C. Review and sign RFI's submitted by Subcontractors, Sub-Subcontractors, or Suppliers prior to submittal to Architect.

- D. Maintain log of RFI's showing RFI number and current status of each RFI.
- E. When RFI's require submittal of drawings, follow submittal procedures specified for Shop Drawings in Section 01 33 00.
- F. Submit one copy. Submit electronically in Adobe PDF format.
- G. Allow minimum 10 days for Architect's review and response to each RFI.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Schedule of Values.
 - 2. Applications for Payment.
- B. Related Sections:
 - 1. Section 01 77 00 - Closeout Procedures.

1.2 SCHEDULE OF VALUES

- A. General:
 - 1. Submit a Schedule of Values to Architect at least 20 days prior to submitting first Application for Payment.
 - 2. Upon request of Architect, furnish additional data to support values given that will substantiate their correctness.
 - 3. Approved Schedule of Values will be used as basis for reviewing Contractor's Applications for Payment.
- B. Form and Content:
 - 1. Format: AIA Document G703 - Continuation Sheet of Application and Certification for Payment.
 - 2. Use Table of Contents of Project Manual as basis of format for listing costs of Work.
 - 3. List installed value of component parts of Work in sufficient detail to serve as basis for computing values for progress payments.
 - 4. Include separate line items for:
 - a. Site mobilization.
 - b. Bonds and insurance.
 - c. Contractor's overhead and profit.
 - 5. For items on which payment will be requested for stored materials, break down value into:
 - a. Cost of materials, delivered and unloaded, with taxes paid.
 - b. Total installed value.
 - 6. For each line item that has a value of more than \$30,000.00, break down costs to list major products or operations under each item.
 - 7. Total of costs listed in Schedule shall equal Contract Sum.

- C. Submit one copy. Submit electronically in Adobe PDF format.
- D. Review and Resubmittal:
 - 1. After initial review by Architect, revise and resubmit if required.
 - 2. Revise and resubmit along with next Application for Payment when a Change Order is issued. List each Change Order as a new line item.

1.3 APPLICATIONS FOR PAYMENT

- A. Preparation:
 - 1. Format: AIA Document G702 - Application and Certification for Payment, supported by AIA Document G703 - Continuation Sheet.
 - 2. Prepare required information in typewritten format or on electronic media format.
 - 3. Use data from reviewed Schedule of Values. Provide dollar value in each column for each line item representing portion of work performed.
 - 4. List each authorized Change Order as a separate line item, listing Change Order number and dollar value.
 - 5. Prepare Application for Final Payment as specified in Section 017700.
- B. Waivers of Lien:
 - 1. Along with the each Application for Payment, submit waivers of lien from Contractor and each Subcontractor or Sub-subcontractor included on the current month's Application for Payment.
 - 2. Submit partial waivers on each item for amount requested, prior to deduction of retainage.
 - 3. For completed items, submit full or final waiver.
- C. Substantiating Data:
 - 1. When Architect requires substantiating information, submit data justifying dollar amounts in question.
 - 2. Provide one copy of data with cover letter showing Application number and date, and line item number and description.
- D. Submittal:
 - 1. Submit one copy. Submit electronically in Adobe PDF format.
 - 2. Payment period: Submit at intervals stipulated in Owner/Contractor Agreement.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
 - 1. Supervisory personnel.
 - 2. Preconstruction conference.
 - 3. Project meetings, minimum of two per month; prepare and distribute minutes.
- B. Reports: Submit daily and special reports.
- C. Work Schedule: Submit progress schedule, updated monthly.
- D. Submittal Schedule: Prepare submittal schedule; coordinate with progress schedule.
- E. Schedule of Values: Submit schedule of values.
- F. Schedule of Tests: Submit schedule of required tests including payment and responsibility.
- G. Perform Surveys: Lay out the work and verifying locations during construction. Perform final site survey.
- H. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.
- I. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 SUBMITTALS

- A. Types of Submittals: Provide types of submittals listed in individual sections and number of copies required below.
 - 1. Shop drawings, reviewed and annotated by the Contractor - 4 copies.
 - 2. Product data - 4 copies.
 - 3. Samples - 2, plus extra samples as required to indicate range of color, finish, and texture to be expected.
 - 4. Inspection and test reports - 4 copies.
 - 5. Warranties - 4 copies.
 - 6. Survey data - 4 copies.
 - 7. Closeout submittals - 4 copies.
 - 8. Project photographs - 12 digital images each month submitted on CD. Submit cumulative CD at each subsequent submittal. Label each image with date.

- B. Submittal Procedures: Comply with project format for submittals. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.
- C. Samples and Shop Drawings: Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.
- D. Warranties: Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Contractor, supplier or installer responsible for performance of warranty shall sign warranties.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project coordination.
 - 2. Coordination drawings.
 - 3. Project meetings.
- B. Related Sections:
 - 1. Section 017700 - Contract Closeout.

1.2 PROJECT COORDINATION

- A. Submit required project submittals electronically in Adobe PDF format.
- B. Coordinate scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- D. Coordinate space requirements and installation of mechanical and electrical items that are indicated diagrammatically on Drawings.
 - 1. Follow routing shown as closely as practical; place runs parallel with building lines.
 - 2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean up of work of separate Sections in preparation for Substantial Completion.
- G. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.3 COORDINATION DRAWINGS

- A. Coordination Drawings:
 - 1. Prior to commencement of Work, prepare coordination drawings to define relationship of mechanical, plumbing, fire protection, and electrical components with beams, columns, ceilings and walls.

2. Include plans, elevations, sections, and details required to define relationships between components.
3. Prepare drawings at 1/4 inch = 1'-0" scale for general layout and 3/8 inch = 1'-0" for plans and sections in congested areas including equipment spaces.
4. Submit one copy. Submit electronically in Adobe PDF format.
- B. Hold coordination meetings with trades providing mechanical, plumbing, fire protection, and electrical work.
- C. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures on original composite coordination Drawings.
- D. When conflicts cannot be resolved:
 1. Cease work in areas of conflict and request clarification prior to proceeding.
 2. Prepare drawings to define and to indicate proposed solution.
 3. Submit drawings for approval when actual measurements and analysis of Drawings and Project Manual indicate that various systems cannot be installed without significant deviation from intent of Contract Documents.
- E. Submit original composite coordination drawings as part of Project Record Documents specified in Section 017700.

1.4 PROJECT MEETINGS

- A. Schedule and administer preconstruction conference, progress meetings, and pre-installation conferences.
- B. Make physical arrangements for meetings; notify involved parties at least 4 days in advance.
- C. Record significant proceedings and decisions at each meeting; reproduce and distribute copies to parties in attendance and others affected by proceedings and decisions made.

1.5 PRECONSTRUCTION CONFERENCE

- A. Schedule within 15 days after date of Notice to Proceed at central site convenient to all parties.
- B. Attendance:
 1. Contractor.
 2. Owner.
 3. Architect and principal consultants.
 4. Major subcontractors and suppliers as Contractor deems appropriate.
- C. Review and Discuss:
 1. Relation and coordination of various parties, and responsible personnel for each party.
 2. Use of premises, including office and storage areas, temporary controls, and security procedures.

3. Construction schedule and critical work sequencing.
4. Processing of:
 - a. Contract modifications.
 - b. Shop Drawings, Product Data, and Samples.
 - c. Applications for Payment.
 - d. Substitutions.
 - e. Requests for Information.
 - f. Other required submittals.
5. Adequacy of distribution of Contract Documents.
6. Procedures for maintaining contract closeout submittals.
7. Installation and removal of temporary facilities.
8. Notification procedures and extent of testing and inspection services.

1.6 PROGRESS MEETINGS

- A. Schedule weekly progress meetings.
- B. Location: Contractor's Project field office.
- C. Attendance:
 1. Contractor.
 2. Owner.
 3. Architect and consultants as appropriate to agenda.
 4. Subcontractors and suppliers as appropriate to agenda.
 5. Others as appropriate to agenda.
- D. Review and Discuss:
 1. Work progress since previous meeting, including:
 - a. Field observations, deficiencies, conflicts, and problems.
 - b. Progress and completion date.
 - c. Corrective measures needed to maintain quality standards, progress, and completion date.
 2. Status of:
 - a. Requests for information.
 - b. Submittals.
 - c. Contract modifications.
 3. Coordination between various elements of Work.
 4. Maintenance of Project Record Documents.

1.7 PRE-INSTALLATION CONFERENCES

- A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.
- B. Require attendance of parties directly affecting or affected by work of the specific Section.
- C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction progress schedule.
- B. Related Sections:
 - 1. Section 01 11 00 Summary of Work: Work sequence.

1.2 FORMAT

- A. Prepare Progress Schedule as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Multiples of 8 1/2 x 11 inches.

1.3 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification Section number.
- C. Identify work of logically grouped activities.
- D. Provide sub schedules for each phase of Work identified in Section 01 11 00.
- E. Provide sub schedules to define critical portions of the entire Progress Schedule.
- F. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- G. Provide separate schedule of submittal dates for Shop Drawings, Product Data, and Samples, including:
 - 1. Dates reviewed submittals will be required from Architect.
 - 2. Decision dates for selection of finishes.
 - 3. Delivery dates for Owner furnished products and Products identified under Allowance.
- H. Coordinate content with Schedule of Values specified in Section 012900.
- I. Revisions:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

- J. Provide narrative report to define problem areas, anticipated delays, and impact on Progress Schedule. Report corrective action taken, or proposed, and its effect.

1.4 SUBMITTAL

- A. Submit initial Progress Schedule within 15 days after date of Notice to Proceed. After review, resubmit required revised data within 10 days.
- B. Submit revised Progress Schedule with each Application for Payment.
- C. Submit one copy. Submit electronically in Adobe PDF format.

1.5 DISTRIBUTION

- A. Distribute copies of approved Progress Schedule to project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Progress Schedule.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal procedures.
 - 2. Proposed Product list.
 - 3. Submittal Schedule.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
 - 7. Quality control submittals.
- B. Related Sections:
 - 1. Section 014000 - Quality Requirements.

1.2 SUBMITTAL PROCEDURES

- A. Number each submittal with Project Manual section number and a sequential number within each section. Number resubmittals with original number and an alphabetic suffix.
- B. Identify Project, Contractor, Subcontractor or supplier, pertinent Drawing sheet and detail numbers, and specification Section number, as appropriate.
- C. Submit all submittals listed under "Submittals for Review" simultaneously for each Product or Specification Section.
- D. Where multiple Products function as an assembly, group submittals for all related Products into single submittal.
- E. Refer to Section 013329 for Sustainable Design Submittals to be submitted concurrently with Submittals for Review.
- F. Architect will not review incomplete submittals.
- G. Apply Contractor's stamp, signed or initialed certifying that:
 - 1. Submittal was reviewed.
 - 2. Products, field dimensions, and adjacent construction have been verified.
 - 3. Information has been coordinated with requirements of Work and Contract Documents.
- H. Schedule submittals to expedite the Project, and deliver to Architect. Coordinate submittal of related items.

- I. For each submittal, allow 14 days for Architect's review, excluding delivery time to and from Contractor.
- J. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of completed Work.
- K. Revise and resubmit submittals when required; identify all changes made since previous submittal.
- L. Distribute copies of reviewed submittals to concerned parties and to Project Record Documents file. Instruct parties to promptly report any inability to comply with provisions.

1.3 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit a complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Submit one copy. Submit electronically in Adobe PDF format.

1.4 SUBMITTAL SCHEDULE

- A. Within 15 days after date of Notice to Proceed, submit a submittal schedule showing all submittals proposed for project, including submittals listed as:
 - 1. Submittals for Review.
 - 2. Quality Control Submittals.
 - 3. Closeout Submittals.
- B. Include for each submittal:
 - 1. Specification section number.
 - 2. Description of submittal.
 - 3. Type of submittal.
 - 4. Anticipated submittal date.
 - 5. For submittals requiring Architect's review, date reviewed submittal will be required from Architect.
- C. Submit one copy. Submit electronically in Adobe PDF format.

1.5 SHOP DRAWINGS

- A. Present information in clear and thorough manner.
- B. Identify details by reference to sheet and detail numbers or room number shown on Drawings.
- C. Reproductions of details contained in Contract Documents are not acceptable.
- D. Contractor shall review all Shop Drawings before distribution to Architect-Engineer.

- E. Submit one copy. Submit electronically in Adobe PDF format. Architect will return one copy to Contractor for printing and distribution.
- F. The Architect-Engineer will review and process only two (2) submissions of each Shop Drawing and/or Sample. Shop Drawings and Samples returned because the Contractor has not complied with the above requirement, the Contractor shall pay the costs of the Architect-Engineer or their consultants for reviewing and processing the third and subsequent submissions.
 - 1. The Architect's, Engineer', and Consultant's costs shall be computed at three (3) times payroll.

1.6 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data.
- B. Supplement manufacturers' standard data to provide information unique to this Project.
- C. Submit one copy. Submit electronically in Adobe PDF format. Architect will return one copy to Contractor for printing and distribution.

1.7 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Where so indicated, submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.
- C. Include identification on each sample, with full product information.
- D. Unless otherwise specified in individual specifications, submit two of each sample.
- E. Architect will notify Contractor of approval or rejection of samples, or of selection of color, texture, or pattern if full range is submitted.

1.8 QUALITY CONTROL SUBMITTALS

- A. Quality control submittals specified in Section 014000 are for information and do not require Architect's responsive action except to require resubmission of incomplete or incorrect information.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 35 16

ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Patching and extending existing work.
2. Transitions and adjustments.
3. Repair of damaged surfaces.

1.2 PROJECT CONDITIONS

A. Hazardous Materials: If asbestos, lead-bearing paint, or other suspected hazardous materials are encountered during work of this Contract:

1. Cease work in affected area immediately.
2. Notify Architect and await instructions.
3. Close off affected areas.

PART 2 PRODUCTS

2.1 MATERIALS

A. New Materials:

1. Provide new materials to match existing adjacent materials for closing of openings, repairs, and reconstructions where suitable salvaged materials do not exist, are insufficient in quantity, or where reuse is not permitted.
2. Match existing materials in material, type, size, quality, color, finish, and other attributes.

B. Reused Materials:

1. Clean and prepare salvaged materials for reuse.
2. Do not use materials with objectionable chips, cracks, splits, dents, scratches, or other defects.
3. Repair operable items to function properly.

PART 3 EXECUTION

3.1 PREPARATION

- A. Test materials to be used in repairs for compatibility with existing materials; do not use incompatible materials.
- B. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore upon completion.
- C. Remove, cut, and patch work in manner to minimize damage and to provide means for restoring products and finishes to their original or specified new condition.

- D. Remove unsuitable materials not marked for salvage.
- E. Remove debris and abandoned items from areas of work and from concealed spaces.

3.2 ALTERATIONS

- A. Coordinate alterations and renovations to expedite completion.
- B. Install products and finish surfaces as specified in individual sections, or where no specification section exists to match existing.
- C. Refinish visible surfaces to specified condition, with neat transition to adjacent surfaces.
- D. Finish patches to provide uniform color and texture over entire surface, with repairs not discernible from normal viewing distance. If finish cannot be matched, refinish entire surface to nearest intersections.
- E. Where removal of partitions or walls results in adjacent spaces becoming one, rework finished surfaces to smooth plane, without breaks, steps, or bulkheads.
- F. Where new work abuts or aligns with existing, provide smooth and even transition. Where a change in plane of $\frac{1}{4}$ inch or more occurs, submit recommendation to Architect for transition.
- G. Where alterations expose mechanical and electrical components that were previously concealed, renovate to be concealed in completed work.
- H. In addition to specified replacement of equipment and fixtures, restore mechanical and electrical systems to full operational condition.
- I. Patch holes in exposed surfaces left by removal of mechanical, electrical, and plumbing components.

END OF SECTION

SECTION 01 35 46

INDOOR AIR QUALITY MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Indoor Air Quality Management Plan.
2. During construction:
 - a. Protection of heating, ventilating, and air conditioning systems.
 - b. Reducing emissions through source control.
 - c. Pathway interruption.
 - d. Housekeeping.
 - e. Scheduling.
3. Before occupancy: Flush-out.

1.2 REFERENCES

- A. American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size.
- B. Sheet Metal and Air Conditioning Manufacturer's Association International (SMACNA) - IAQ Guidelines for Occupied Buildings Under Construction.
- C. U.S. Green Building Council (USGBC) - Leadership in Energy and Environmental Design (LEED) 2009 - Green Building Rating System for New Construction and Major Renovations.

1.3 QUALITY ASSURANCE

- A. Review and discuss Indoor Air Quality Management Plan implementation and progress at Preconstruction Conference and Progress Meetings.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Designate specific storage areas to facilitate protection of stored absorptive materials.
- B. Clearly identify storage area. Keep clean and orderly; prevent contamination of materials.
- C. Monitor storage areas for contamination; correct problems and implement preventative measures.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION**3.1 IMPLEMENTATION - DURING CONSTRUCTION**

- A. Meet or exceed SMACNA minimum requirements for heating, ventilating, and air conditioning system protection, source control, pathway interruption, housekeeping, and scheduling.
- B. Protect stored on-site or installed absorptive materials from moisture damage and volatile organic compound contamination through construction sequencing and proper storage.
- C. If air handlers are used during construction, use filtration media with Minimum Efficiency Reporting Value (MERV) of 8 per ASHRAE 52.2.
- D. Replace filtration media just prior to occupancy.
- E. Heating, Ventilating, and Air Conditioning System Protection:
 - 1. Keep duct systems including supply air, return air, and exhaust air and associated equipment including air handlers, variable air volume boxes, silencers, fans, and filter boxes, clean and uncontaminated.
 - 2. Seal taps and open ends not actively being worked on with plastic and tape.
 - 3. Provide 1 inch polyester filter media over return and exhaust air inlets during construction and until Substantial Completion.
 - 4. Ensure that temporary and permanent filters are in place and openings are closed before running fans.
 - 5. Protect existing heating, ventilating, and air conditioning systems with 1 inch polyester media installed over outside air intakes. Change out filter media on intakes to minimize pressure drops. Provide frequent filter change out to keep filter pressure drop at existing fan-coils below approximately 0.30 inch s.p.
- F. Source Control:
 - 1. For temporary and ancillary materials used in construction, follow requirements of similar products to minimize indoor air quality impacts.
 - 2. Use nontoxic formulations and implement other control measures to minimize building contamination.
- G. Pathway Interruption: Isolate areas where work is being performed to prevent contamination of clean spaces.
- H. Housekeeping:
 - 1. Implement cleaning activities concentrating on heating, ventilating, and air conditioning systems and building space to remove contaminants prior to occupancy.
 - 2. Protect materials from weather and store in clean area prior to unpacking.
 - 3. Clean coils, air filters, and fans before performing testing and balancing.
 - 4. Provide temporary walk-off mats at entry points to construction areas; replace or clean daily.

I. Scheduling:

1. Sequence construction activities to reduce absorption of and volatile organic compounds by materials.
2. Complete applications of wet and odorous materials before installing absorptive materials.

1.4 IMPLEMENTATION - BEFORE OCCUPANCY

- A. After completion of construction, prior to Owner occupancy, and after completion of interior finishes, perform building flush-out:
 1. Supply total air volume of 14,000 CF of outdoor air per square foot of floor area.
 2. Maintain minimum interior temperature of 60 degrees F and maximum relative humidity of 60 percent during flush-out.
- B. Replace filtration media after final cleaning.
- C. Complete air testing and balancing prior to beginning baseline air testing.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. References.
 - 2. Quality assurance and control of installation.
 - 3. Mockups.
 - 4. Manufacturer's field services and reports.
 - 5. Design data and calculations.
 - 6. Test reports and certifications.
 - 7. Manufacturer's installation instructions.

1.2 REFERENCES

- A. For products or workmanship specified by reference to association, trade, or industry standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Conform to edition of reference standard in effect as of date of Owner/Contractor Agreement.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 MOCKUPS

- A. Definition:
 - 1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner and Architect that illustrate materials, equipment, or workmanship.
 - 2. Approved mockups establish the standard of quality by which the Work will be judged.
- B. Construct, apply, or assemble specified items, with related attachment and anchorage devices, flashings, seals, and finishes.
- C. Perform work in accordance with applicable specifications sections.
- D. Erect at project site at location acceptable to Architect. Protect from damage.
- E. Removal:
 - 1. Mockups may remain as part of the Work only when so designated in individual specification sections.
 - 2. Do not remove mockups until removal is approved by Architect or upon Final Completion.
 - 3. Where mockup is not permitted to remain as part of the Work, clear area after removal of mockup has been approved by Architect.

1.5 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, or startup of equipment, as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit one copy. Submit electronically in Adobe PDF format within 10 days after each observation.

1.6 DESIGN DATA AND CALCULATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide design data and calculations.
- B. Accuracy of design data and calculations is the responsibility of the Contractor.
- C. When so specified, prepare design data and calculations under the direction of a professional engineer licensed in the state in which the Project is located. Affix engineer's seal to submittals.
- D. Submit one copy. Submit electronically in Adobe PDF format.

1.7 TEST REPORTS AND CERTIFICATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide test reports and manufacturers' certifications.

- B. Indicate that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Submittals may be recent or previous test results on material or Product, but must be acceptable to Architect.
- D. Submit one copy. Submit electronically in Adobe PDF format.

1.8 MANUFACTURER'S INSTALLATION INSTRUCTIONS

- A. When Contract Documents require that Products be installed in accordance with manufacturer's instructions:
 - 1. Submit manufacturer's most recent printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, as applicable.
 - a. Submit in quantities specified for Product Data.
 - b. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
 - c. Identify conflicts between manufacturers' instructions and requirements of Contract Documents.
 - 2. Perform installation of Products to comply with requirements of manufacturer's instructions.
 - 3. If installation cannot be performed in accordance with manufacturer's instructions, notify Architect and await instructions.
 - 4. Submit one copy. Submit electronically in Adobe PDF format.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Temporary utilities.
2. Field offices and sheds.
3. Temporary controls.
4. Protection of installed Work.
5. Security.
6. Progress cleaning.
7. Water, erosion, sediment, dust, and mold and mildew control.
8. Access roads and parking areas.
9. Removal.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cleaning Materials: Use only materials that:

1. Are not potentially hazardous to health or property.
2. Do not contain hazardous ingredients.
3. Are non-carcinogenic.
4. Are non or mildly irritating to skin, eyes, and mucous membranes.
5. Are non-reactive.
6. Do not require respiratory protection.

PART 3 EXECUTION

3.1 TEMPORARY LIGHTING

- A. Provide temporary lighting for construction and security purposes.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lamps and provide routine repairs.
- D. Provide portable lights when required to provide minimum lighting levels necessary for specific work.

3.2 TEMPORARY HEAT

- A. Provide temporary heating devices required to maintain specified ambient temperatures for construction.
- B. Existing heating facilities may not be used during construction.
- C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless otherwise indicated in individual specification sections.

3.3 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to facilitate curing of materials, disperse humidity, and prevent accumulations of dust, fumes, vapors, or gases.
- B. Provide temporary fan units as required to maintain clean air for construction.
- C. Existing ventilation equipment may not be used during construction.

3.4 TEMPORARY TELEPHONE, FACSIMILE, AND COMPUTER SERVICES

- A. Contractor shall be accessible during normal business hours via mobile telephone with voice mail or an answering service.
- B. Provide computer in Contractor's field office with printer, Internet access, scanner, and email service.

3.5 TEMPORARY SANITARY FACILITIES

- A. Provide chemical toilets for use during construction.
- B. Existing toilets may not be used during construction.
- C. Permanent toilets may not be used during construction.
- D. Maintain facilities in clean and sanitary condition.

3.6 FIELD OFFICES

- A. Areas within existing building designated by Owner may be used for field office and storage of materials subject to damage by weather.
- B. Do not unreasonably encumber site or premises with excess materials or equipment.
- C. Field Office:
 - 1. Size required for Contractor's use and to provide space for project meetings.
 - 2. Adequate electrical power, lighting, heating, and cooling to maintain human comfort.
 - 3. Provide facilities for storage of Project Record Documents.

3.7 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow Owner's use of site and premises, and to protect existing facilities and adjacent properties from construction operations.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing facilities.

C. Tree and Plant Protection:

1. Protect existing trees and plants at site that are designated to remain.
2. Remove roots and branches that interfere with construction.
3. Provide temporary barriers to height of 6 feet around individual or groups of trees and plants.
4. Do not permit vehicular traffic, parking, storage of materials, dumping of harmful chemicals or liquids, or standing or continuously running water within root zones.
5. Supervise earthwork operations to prevent damage to root zones.
6. Replace trees and plants that are damaged or destroyed due to construction operations.

3.8 EXTERIOR CLOSURES

- A. Provide temporary weathertight closures for exterior openings to provide acceptable interior working conditions, to allow for temporary heating and maintenance of ambient temperatures required in individual specification sections, to protect the Work, and to prevent entry of unauthorized persons.
- B. Provide access doors with locking hardware.

3.9 PROTECTION OF INSTALLED WORK

- A. Protect installed work from construction operations; provide special protection when required in individual specification sections.
- B. Minimize traffic, storage, and construction activities on roof surfaces. If traffic, storage, or activity is necessary, obtain recommendations for protection from roofing manufacturer.
- C. Prohibit traffic from landscaped areas.

3.10 SECURITY

- A. Provide a project security program, to:
 1. Protect the Work, stored products, and construction equipment from theft and vandalism.
 2. Prevent entry by unauthorized persons.
 3. Protect Owner's operations from theft, vandalism, and damage.

3.11 PROGRESS CLEANING

- A. Maintain areas free from waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Provide containers for collection of waste materials, debris, and rubbish; remove and dispose of off-site as required by construction activities.
- C. Periodically clean interior areas to provide suitable conditions for finish work.

3.12 TEMPORARY CONTROLS

- A. Dust Control:
 - 1. Provide dust control materials and methods to minimize dust from construction operations.
 - 2. Prevent dust from dispersing into atmosphere.
- B. Mold and Mildew Control:
 - 1. Provide continuous measures to prevent formation of mold and mildew in construction.
 - 2. Do not install materials sensitive to mold and mildew growth until protection can be provided.
 - 3. Promptly remove and replace materials exhibiting mold and mildew growth.

3.13 ACCESS ROADS AND PARKING AREAS

- A. Keep fire hydrants and water control valves free from obstruction and accessible for use.
- B. Co-ordinate with Owner to determine a limited but reasonable number of parking spaces onsite for Contractor personnel during construction. When parking needs exceed the allowance by Owner, provide for additional parking accommodations.

END OF SECTION

SECTION 01 56 00

TEMPORARY JOBSITE PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary jobsite protection including:

1. Floor and Wall Protection.
2. Floor and Wall Seaming Tape.
3. Door Jamb Protection.
4. Carpet protection.
5. Dust containment.
6. Adhesive tape.
7. Portable Jobsite Trash Containers.

1.2 RELATED SECTIONS

- A. Section 02 41 19 – Selective Demolition
- B. Section 03 30 00 – Cast-in-Place Concrete.
- C. Section 06 11 00 – Framing and Sheathing
- D. Section 06 20 00 – Finish Carpentry
- E. Section 08 00 00 – Openings
- F. Section 08 12 13 – Hollow Metal Frames
- G. Section 08 13 13 – Hollow Metal Doors
- H. Section 08 14 16 – Flush Wood Doors
- I. Section 09 21 16 – Non-Structural Metal Framing
- J. Section 09 50 00 – Acoustical Ceiling
- K. Section 09 65 19 – Resilient Tile Flooring
- L. Section 09 91 00 – Painting

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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 and removal methods.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 years documented experience manufacturing similar products.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store indoors in accordance with the manufacturer's recommendations.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Remove and dispose of materials in accordance with requirements of local authorities having jurisdiction.

1.6 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Surface Shields, Inc., which is located at: 10457 163rd Place; Orland Park, IL 60467; Toll Free Tel: 800-754-9685; Tel: 708-226-9810; Fax: 708-226-9817; Email: [request info \(\)](mailto:requestinfo@surfaceshields.com); Web: <http://www.surfaceshields.com>
- B. Acceptable Manufacturer: Surface Shields, Inc., which is located at: 10457 163rd Place; Orland Park, IL 60467; Toll Free Tel: 800-754-9685; Tel: 708-226-9810; Fax: 708-226-9817; Email: [request info \(\)](mailto:requestinfo@surfaceshields.com); Web: <http://www.surfaceshields.com>
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 FLOOR AND WALL PROTECTION

- A. Ram Board Plus: Model # RB PLUS 38-100 Ram Board Plus as manufactured by Ram Board. Board is pre-taped for faster installs.

1. Standards Compliance: FSC certified. Recycled and recyclable materials.
 2. Pre-Taped for Faster Installs saving up to 30% on installation of surface protection.
 - a. Wall Guard Feature: Fold lines allowing corner, horizontal and vertical wall protection.
 3. Wall guard fold lines at 4 inches (101 mm), 8 inches (203 mm) and 12 inches (305 mm) from edge of board.
 4. Flex-Fiber Technology: Provides unmatched protection from impact while remaining flexible.
 5. Vapor-Cure Technology: Allows protected substrates and finishes to cure while being protected so work may continue.
 6. Spill Guard Technology: Provides added protection against water, paint, mud, and more.
 7. Roll Dimensions (W x L): 38 inches by 100 feet (965 mm by 30.5 m). 317 sq ft (29.5 sq m).
 8. Rolls per Pallet: 16.
- B. Multi Shield: Model # MS40164 as manufactured by Surface Shields
1. Features:
 - a. Self-adhering mat for multi surfaces
 - b. Will not leave a sticky residue
 - c. Shields work area from dirt, moisture and liquids
 - d. Light-weight and breathable
 - e. Reusable and easily rolls up for quick storage
 - f. Durable, tear-proof and hard-wearing
 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Industrial
 - d. Drywall
 - e. Painting
 - f. Temporary Protection
 3. Product Specifications
 - a. Thickness: 2.5 - 2.8 mm
 - b. Material: PET Fibers (100 percent recycled fibers) with PE waterproof top layer

- c. Underside: Residue free, anti-slip adhesion
 - d. Adhesion Level: 6 oz./in.
 - e. Tensile Strength: 115-120 psi
 - f. Temperature (Ideal): 70 degrees F
 - g. Humidity (Ideal): 50 percent
 - h. Elongation: 80-90 percent
 - i. Chemical Name: n.a.
 - j. Chemical Family: n.a.
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Multi Shield
 - m. Material Use: Surface Protection
4. Available Sizes:
- a. MS4054; Blue, 40 inches by 54 feet, 6 lbs.
 - b. MS40164; Blue, 40 inches by 164 feet, 18 lbs.
5. Handling and Storage
- a. No special handling requirements. Keep away from flammable and combustible material. Paper products will not release hazardous chemicals under normal conditions of use.
6. Installation Instructions
- a. Before laying Multi Shield, thoroughly sweep area to remove dust and debris. Place on desired surface and unroll. Cut to length with utility knife. Seam multiple pieces together with tape for larger areas. Do not adhere tape directly to floors. When finished, roll up Multi Shield for reuse or disposal.
- C. Plasti Shield: Model #PLS4896W4 as manufactured by Surface Shields
1. Features:
- a. Non-Toxic
 - b. Strong and durable Impact resistant
 - c. Cost effective
 - d. Easy to convert
 - e. 100 percent recyclable
 - f. Lightweight
 - g. Reusable
 - h. Hygienic

- i. Water resistant
- 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Tuck Pointing
 - d. Drywall
 - e. Painting
 - f. Temporary Protection
- 3. Product Specifications
 - a. Thickness: 4 mm
 - b. Material: Polypropylene
 - c. Density (grams/sq. meter): 650
 - d. Density (lbs./1000 sq. ft.): 133
 - e. Surface Tension (Dyne Level): 42dyne/cm
 - f. Tear Strength: 1700 gms
 - g. Tensile Strength: 4000 lbs. / sq. inch
 - h. Impact Dart Strength: 320 inches / lb.
 - i. Temperature (Ideal): 70 degrees F
 - j. Humidity (Ideal): 50 percent
 - k. Heat Def. Load: 174 degrees @ 66 lbs. per sq. inch
 - l. Chemical Name: Polypropylene Homopolymer
 - m. Chemical Family: Copolymer Polypropylene
 - n. Chemical Formula: Proprietary
 - o. Trade Name: Plasti Shield
 - p. Material Use: Surface Protection
- 4. Available Sizes
 - a. PLS4896W4 White 48 inches by 96 inches 4 lbs.
- 5. Handling and Storage
 - a. No special handling requirements. Keep away from flammable and combustible material. Paper products will not release hazardous chemicals under normal conditions of use.
- 6. Installation Instructions
 - a. Flooring Installation: Before laying Plasti Shield, thoroughly sweep area to remove dust and debris. Lay out Plasti Shield to cover the

whole area, cut Plasti Shield to length as needed. Seam Plasti Shield together with an appropriate adhesive tape. Replace any Plasti Shield that becomes damaged.

- b. Wall Installation: Before attaching Plasti Shield, test tape against the wall, to ensure no negative interactions. Provide enough Plasti Shield to cover the whole area, and cut Plasti Shield to length. Seam Plasti Shield together with an appropriate adhesive tape i.e Arm Bar Tape by Surface Shields. Replace any Plasti Shield that becomes damaged.
- c. Door Installation: Before attaching Plasti Shield, test tape against the door, to ensure no negative interactions. Provide enough Plasti Shield to cover the door, and cut Plasti Shield to length. Replace any Plasti Shield that becomes damaged.

D. Water Shield: Model # WS60300 as manufactured by Surface Shields

1. Features:

- a. Non-staining
- b. Made from two strong kraft papers laminated with fiberglass scrim reinforcement
- c. Does not tear under normal traffic wear
- d. Protects hardwood, ceramic tile, marble, travertine and more

2. Applications:

- a. Construction
- b. Remodeling
- c. Industrial
- d. Drywall
- e. Painting
- f. Temporary Protection

3. Product Specifications

- a. Thickness: 9.0 mil nominal
- b. Material: Kraft Paper, Fiberglass
- c. Backing Type: n.a.
- d. Adhesion Level: none
- e. Tensile Strength: n.a.
- f. Temperature (Ideal): 70 degrees F
- g. Humidity (Ideal): 50 percent
- h. Elongation: n.a.

- i. Chemical Name: Paper/Fiberglass/Hot Melt
 - j. Chemical Family: Paper/Fiberglass/Hot Melt
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Water Shield
 - m. Material Use: Surface Protection
 - 4. Available Sizes
 - a. WS36300 Natural 36 inches by 300 feet 25 lbs.
 - b. WS48300 Natural 48 inches by 300 feet 34 lbs.
 - c. WS60300 Natural 60 inches by 300 feet 42 lbs.
 - d. WS72300 Natural 72 inches by 300 feet 51 lbs.
 - e. WS96300 Natural 96 inches by 300 feet 65 lbs.
 - 5. Handling and Storage
 - a. Store at room temperature. Avoid high humidity environments.
 - 6. Instructions:
 - a. Before laying Water Shield, thoroughly sweep area to remove dust and debris. Place on desired surface and unroll. Cut to length with utility knife. Seam multiple pieces together with tape for larger areas. Do not adhere tape directly to floors. When finished, roll up Water Shield and discard. If Water Shield becomes damaged replace as needed.
- E. Window Shield by Surface Shields
- 1. Features:
 - a. Self-adhering protective film for windows and glass
 - b. Protects against overspray, mortar stains and stucco
 - c. No more scraping and cleaning damage to the glass
 - d. Saves time, labor and money
 - 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Tuck Pointing
 - d. Drywall
 - e. Painting
 - f. Temporary Protection
 - 3. Product Specifications

- a. Thickness: 1.5 mil nominal (short term), 3.1 mil nominal (long term)
 - b. Film: Polyethylene w/UV Inhibitor (short term), PVC w/UV Inhibitor (long term)
 - c. Adhesive: Type Water-based Acrylic
 - d. Adhesion: Level 8.5 oz./in. (short term), 48 oz./in. (long term)
 - e. Tensile Strength: 2-3000 psi (short term), 5100 psi (long term)
 - f. Temperature (Ideal): 70 degrees F
 - g. Humidity (Ideal): 50 percent
 - h. Elongation: 300-400 percent (short term), 260 percent (long term)
 - i. Chemical Name: Acrylic PSA Tapes
 - j. Chemical Family: Acrylic PSA Polyethylene Film
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Window Shield
 - m. Material Use: Surface Protection
4. Available Sizes
- a. W2B12600 Blue 12 inches by 600 feet (30-45 days, 2pk)
 - b. W2B24250 Blue 24 inches by 250 feet (30-45 days)
 - c. W2B24600 Blue 24 inches by 600 feet (30-45 days)
 - d. W2C24600 Clear 24 inches by 600 feet (30-45 days)
 - e. W2C36250 Clear 36 inches by 250 feet (30-45 days)
 - f. W3C24600 Clear 24 inches by 600 feet (90-180 days)
 - g. W4B24330 Blue 24 inches by 330 feet PVC Long term (6 mns -1yr)
 - h. W4B36330 Blue 36 inches by 330 feet PVC Long term (6 mns -1yr)
5. Handling and Storage
- a. Store at room temperature and keep out of direct sunlight exposure. If Window Shield is stored in extreme conditions over 95 degrees F or below 40 degrees F allow product to return to room temperature prior to use.
6. Installation
- a. Clean surface to remove any dust or debris. Place on desired surface and unroll. Cut to length with utility knife. When finished, roll up Window Shield and discard. If Window Shield becomes damaged replace with new Window Shield. Only leave Window Shield on glass per Window Shield model and instructions.

2.3 FLOOR AND WALL SEAMING TAPE

- A. Seaming Tape: Model # RT 3-164 as manufactured by Ram Board. Used to cover Ram Board seams.
 - 1. Backing: Unique kraft backing tears easily and creates an extremely durable, smooth finish.
 - 2. Recyclable: 100 percent.
 - 3. Dimensions: 3 inches W by 164 feet L (76 mm W by 50 m L).
 - 4. Rolls per Box: 16.
- B. Vapor-Cure Tape: Model # RB VCT 3-108 as manufactured by Ram Board. Used to cover Ram Board seams which prevents tape lines.
 - 1. Performance: Allows vapors and moisture to escape from concrete, glue down floors, stained floors, epoxy floors, refinished floors, vinyl composition tile, and most other floor types.
 - 2. Dimensions: 3 inches W by 108 feet L (76 mm W by 32.9 m L).
 - 3. Rolls per Box: 16.
- C. Edge Tape: Model #RB ET 2.5-180 as manufactured by Ram Board. Used to secure Ram Board Temporary Floor Protection edges to flooring or wall surfaces.
 - 1. Performance: Easy Release, low tack tape for up to 14 days. Grips tightly to Ram Board while easy release on flooring surfaces up to 14 days.
 - 2. Dimensions: 2.5 inches W by 180 feet L (63.5 mm W by 55 m L).
 - 3. Rolls per Box: 20.

2.4 DOOR JAMB PROTECTION

- A. Door Jamb Protection: Model # RBJP 60 or RBJP 36 Ram Jamb as manufactured by Ram Board. Heavy-duty flexible re-usable door jamb protection.
 - 1. Materials: Recycled and recyclable materials.
 - 2. Door Jamb Sizes: Fits 4 inch to 9 inch (102 mm to 229 mm).
 - 3. Length: 36 inch or 60 inch (914 mm and 1524 mm).
 - 4. Material Thickness: 65 mils (1.65 mm).

2.5 CARPET PROTECTION

- A. Carpet Shield: Model # CS36500 as manufactured by Surface Shields
 - 1. Features:
 - a. Self-adhering film designed to protect carpeting
 - b. Protects clients' carpeting from damage claims while building, remodeling or painting
 - c. Ideal protection during inclement weather

- d. Highly resistant to tears and punctures
 - e. Protects all types of carpeting for up to 30 days
2. Applications:
- a. Construction
 - b. Moving
 - c. Remodeling
 - d. Model Homes
 - e. Drywall
 - f. Painting
 - g. Temporary Protection
3. Product Specifications
- a. Thickness: 2.5 mil nominal
 - b. Film: Low Density Polyethylene
 - c. Adhesive Type: Formulated Acrylic
 - d. Adhesion Level: 17-25 oz./in.
 - e. Tensile Strength: 3000 psi
 - f. Temperature (Ideal): 70 degrees F
 - g. Humidity (Ideal): 50 percent
 - h. Elongation MD: 350 percent - 500 percent
 - i. Chemical Name: Acrylic PSA Tapes
 - j. Chemical Family: Acrylic PSA Polyethylene Film
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Carpet Shield
 - m. Material Use: Surface Protection
4. Available Sizes
- a. CS2130W Clear 21 inches by 30' 12 lbs. Shelf Display
 - b. CS2450W Clear 24 inches by 50 feet 18 lbs. Shelf Display
 - c. CS24200L Clear 24 inches by 200 feet 6 lbs. Reverse Wound
 - d. CS24500 Clear 24 inches by 500 feet 15 lbs. Reverse Wound
 - e. CS241000 Clear 24 inches by 1000 feet 30 lbs. Reverse Wound
 - f. CS30200 Clear 30 inches by 200 feet 7.5 lbs. Reverse Wound
 - g. CSR30200 Clear 30 inches by 200 feet 7.5 lbs. Regular Wound
 - h. CS36200 Clear 36 inches by 200 feet 9 lbs. Reverse Wound

- i. CS36250 Clear 36 inches by 250 feet 11 lbs. Reverse Wound
 - j. CS36500 Clear 36 inches by 500 feet 23 lbs. Reverse Wound
 - k. CS361000 Clear 36 inches by 1000 feet 45 lbs. Reverse Wound
 - l. CS48500 Clear 48 inches by 500 feet 35 lbs. Reverse Wound
5. Handling and Storage
- a. Do not apply to hardwood floors or other hard surfaces. Always test Carpet Shield on a small portion of carpet that is in a non-exposed area. 72-hour test required for use over adhesive installations. Temporary protection for up to 30 days. Recommended for synthetic carpeting only. Apply only to dry carpet, do not use under damp conditions.
6. Application Instructions:
- a. Before applying Carpet Shield, thoroughly clean and vacuum to remove dust and debris. Place on desired surface and unroll. Cut to length with utility knife. When finished, roll up Carpet Shield and discard. If Carpet Shield becomes damaged replace with new Carpet Shield. Replace Carpet Shield every 30 days. Do not apply Carpet Shield to wool based carpet. Follow all installation methods and instructions that come with Carpet Shield.

2.6 DUST CONTAINMENT

A. Clean Mats by Surface Shields: Model # CM2436B4

- 1. Features:
 - a. Tacky surface mat to remove dust and dirt from footwear
 - b. Mat contains 30 tabbed sheets for easy removal
 - c. Prevents dust and dirt from spreading while building or remodeling
 - d. Do not adhere to carpeted surfaces
- 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Warehouse
 - d. Drywall
 - e. Industrial
 - f. Temporary Protection
- 3. Product Specifications
 - a. Thickness: 2.0 mil nominal
 - b. Film: Low Density Polyethylene

- c. Adhesive Type: Water Based Acrylic
 - d. Adhesion Level: 14-18 oz./in.
 - e. Tensile Strength 150 lbs./in
 - f. Temperature (Ideal) 70 degrees F
 - g. Humidity (Ideal) 50 percent
 - h. Elongation 250-300 percent
 - i. Chemical Family: Polyethylene Film
 - j. Chemical Formula: Proprietary
 - k. Trade Name: Clean Mat
 - l. Material Use: Surface Protection
4. Available Sizes
- a. CM1836B4: Blue 18 inches by 36 inches (4 pack) 7 lbs.
 - b. CM1836W4: White 18 inches by 36 inches (4 pack) 7 lbs.
 - c. CM1845B4: Blue 18 inches by 45 inches (4 pack) 8 lbs.
 - d. CM1845W4: White 18 inches by 45 inches (4 pack) 8 lbs.
 - e. CM2436B4: Blue 24 inches by 36 inches (4 pack) 9 lbs.
 - f. CM2436W4: White 24 inches by 36 inches (4 pack) 9 lbs.
 - g. CM2445B4: Blue 24 inches by 45 inches (4 pack) 11 lbs.
 - h. CM2445W4: White 24 inches by 45 inches (4 pack) 11 lbs.
 - i. CM3636B4: Blue 36 inches by 36 inches (4 pack) 13 lbs.
 - j. CM3636W4: White 36 inches by 36 inches (4 pack) 13 lbs.
 - k. CM3645B4: Blue 36 inches by 45 inches (4 pack) 16 lbs.
 - l. CM3645W4: White 36 inches by 45 inches (4 pack) 16 lbs.
5. Handling and Storage
- a. Store at room temperature. Do not store in extreme conditions over 95 degrees F or below 40 degrees F.
6. Installation
- a. Place Clean Mat at the entrance/exit of the jobsite to remove dust and debris before entering the jobsite. Replace tabbed sheet as needed. Do not apply Clean Mat on finished surfaces.
- B. Duct Cover Shield: Model # DCR36200B as manufactured by Surface Shields
1. Features:
- a. Self-adhering protective film for HVAC ducts
 - b. Very high adhesion for all types of ductwork

- c. Will not leave a residue on metal after removal
 - d. Highly resistant to tears and punctures
- 2. Applications:
 - a. Construction
 - b. HVAC
 - c. Remodeling
 - d. Closures
 - e. Mechanical
 - f. Temporary Protection
- 3. Product Specifications
 - a. Thickness: 3.0 mil nominal
 - b. Film: Low Density Polyethylene
 - c. Adhesive Type: Water Based Acrylic
 - d. Adhesion Level: 12.7 oz./in.
 - e. Tensile Strength 2800 psi
 - f. Temperature (Ideal) 70 degrees F
 - g. Humidity (Ideal) 50 percent
 - h. Elongation 525 percent
 - i. Chemical Family: Polyethylene Film
 - j. Chemical Formula: Proprietary
 - k. Trade Name: Dust Cover Shield
 - l. Material Use: Temporary closures
- 4. Available Sizes
 - a. DCR318200B: Blue 18 inches by 200 inches 5 lbs.
 - b. DCR324200B: Blue 24 inches by 200 inches 6 lbs.
 - c. DCR24200: Clear 24 inches by 200 inches 6 lbs.
 - d. DCR336200B: Blue 36 inches by 200 inches 9 lbs.
 - e. DCR36200: Clear 36 inches by 200 inches 9 lbs.
 - f. DCR348200B: Blue 48 inches by 200 inches 12 lbs.
- 5. Handling and Storage
 - a. Store at room temperature. If Duct Cover Shield is stored in extreme conditions over 95 degrees F or below 40 degrees F allow product to return to room temperature prior to use.

6. Installation
 - a. Clean surface of ductwork before applying Duct Shield. Remove upon substantial completion of the jobsite, or when ductwork will be made inaccessible.
- C. DUST SHIELD PRO: Model # DSPRO20 or DSPRO2 as manufactured by Surface Shields
 1. Features:
 - a. Makes constructing temporary walls quick and affordable
 - b. Heavy gauge aluminum prevents dents
 - c. Locking head ensures that poly sheeting will not slip out
 - d. Adjustable poles are available in 10 foot, 12 foot and 20 foot.
 - e. 360-degree swivel foot for use on floors and angled ceilings
 - f. Custom printed bags available
 - g. Micro adjust feature increases tension against the ceiling
 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Dust Containment
 - d. Painting
 - e. Temporary Protection
 3. Product Specifications
 - a. Thickness: n.a.
 - b. Bulk Material: Aluminum
 - c. Head/Foot Material: Plastic/Rubber
 - d. Tensile Strength: n.a.
 - e. Temperature (Ideal): 70 degrees F
 - f. Humidity (Ideal): 50 percent
 - g. Elongation: n.a.
 - h. Chemical Name: n.a.
 - i. Chemical Family: n.a.
 - j. Chemical Formula: Proprietary
 - k. Trade Name: Dust Shield PRO Poles
 - l. Material Use: Surface Protection/Dust Containment
 4. Available Sizes

- a. DSPRO2 Red Poles adjust up to 12 feet, 8 lbs.
 - b. DSPRO20 Red Poles adjust up to 20 feet, 12 lbs.
 - 5. Handling and Storage
 - a. Store at room temperature.
 - 6. Installation
 - a. Construct Temporary Dust Containment barriers using Dust Shield Pro Poles and Zip N Close adhesive zippers. Use a jobsite approved poly sheeting. To ensure a tight seal use a Dust Shield Pro Pole every 4-6 feet.
- D. STEP N PEEL Clean Mats by Surface Shields: Model # DG30W
- 1. Features:
 - a. Protects floors from dirt, scuffs and heel marks
 - b. Elastic closure
 - c. Lightweight and breathable
 - d. Cost effective protection for any surface
 - e. Available in cloth and PE coated materials
 - 2. Applications:
 - a. Construction
 - b. Laboratory
 - c. Moving
 - d. Temporary Protection
 - e. Industrial
 - f. Remodeling
 - g. Warehouse
 - 3. Product Specifications
 - a. Thickness: 2.0 mil nominal
 - b. Film: Polyethylene
 - c. Adhesive Type: Water-based Acrylic
 - d. Adhesion Level: 14.0 - 18.0 oz./in.
 - e. Tensile Strength: 2000-3000 psi
 - f. Temperature (Ideal): 70 degrees F
 - g. Humidity (Ideal): 50 percent
 - h. Elongation: 300-400 percent

- i. Chemical Name: Polyethylene / Acrylic
 - j. Chemical Family: Polyethylene / Acrylic
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Step N Peel
 - m. Material Use: Surface Protection
- 4. Available Sizes
 - a. DG30WM: White Frame 25.5 inches by 31.5 inches 30 Sheets 7 lbs.
 - b. DGRCM: Refill 24 inches by 30 inches 30 Sheets 2 lbs.
 - c. DG30W: White Frame 25.5 inches by 31.5 inches 30 Sheets 7 lbs.
 - d. DGRC: Refill 24 inches by 30 inches 30 Sheets 2 lbs.
 - e. DG60W: White Frame 25.5 inches by 31.5 inches 60 Sheets 10 lbs.
 - f. DGRC60 Refill 24 inches by 30 inches 60 Sheets 4.5 lbs.
 - g. DGC: Custom Print (min 12) 30 Sheets 7 lbs.
- 5. Handling and Storage
 - a. Store at room temperature. Do not store in extreme conditions over 95 degrees F or below 40 degrees F.
- 6. Installation
 - a. Place Step N Peel at the entrance/exit of the jobsite to remove dust and debris before entering the jobsite. Replace tabbed sheet as needed.
- E. Vent Mask by Surface Shields
 - 1. Features:
 - a. Keeps dust and debris from entering floor or wall registers during construction or work
 - b. Individual perforated sheets for easy application
 - c. Medium tack / residue free
 - 2. Applications:
 - a. Construction
 - b. Remodeling
 - c. Residential
 - d. Drywall
 - e. Painting
 - f. Temporary Protection
 - 3. Product Specifications

- a. Thickness: n.a.
 - b. Film: Polyethylene
 - c. Adhesive Type: Water-based Acrylic
 - d. Adhesion Level: n.a.
 - e. Tensile Strength: n.a.
 - f. Temperature (Ideal): 70 degrees F
 - g. Humidity (Ideal): 50 percent
 - h. Elongation: n.a.
 - i. Chemical Name: Polyethylene
 - j. Chemical Family: Polyethylene Film
 - k. Chemical Formula: Proprietary
 - l. Trade Name: Vent Mask
 - m. Material Use: Surface Protection
4. Available Sizes
- a. VMC12200P8: Clear 12 inches by 200 feet perforations every 8 inches 2 lbs.
 - b. VMB08185P4: Blue 8 inches by 185 feet perforations every 4 inches 1.5 lbs.
 - c. VMB13185P13: Blue 13 inches by 185 feet perforations every 13 inches 2 lbs.
5. Handling and Storage
- a. Store at room temperature. Avoid high humidity environments.
6. Installation
- a. Clean surface of Vent before applying Vent Shield. Remove upon substantial completion of the jobsite, when ductwork will be made inaccessible or during testing. Do Not Apply to Wooden vent covers
- F. Zip N Close Zippers by Surface Shields: Model # ZC02
- 1. Features:
 - a. Creates instant access to tarps or plastic enclosures
 - b. Pressure sensitive adhesive backing
 - c. Can be opened from either side
 - d. Use 1 zipper for a flap or 2 for a wider opening
 - e. 2 zippers per package
 - 2. Applications:

- a. Construction
 - b. Dust Containment
 - c. Remodeling
 - d. Temporary Walls
 - e. Drywall
 - f. Painting
 - g. Abatement
3. Product Specifications
- a. Thickness: n.a.
 - b. Adhesion Level: n.a.
 - c. Density: n.a.
 - d. Tensile Strength: n.a.
 - e. Temp Resistance: n.a.
 - f. Elongation: n.a.
 - g. Critical Temperature: n.a.
 - h. Cloth Material: Polyester - 300D
 - i. Teeth Material: Polyester
 - j. Teeth Size: 0.74 mm dia.
 - k. Head Material: Zinc Alloy
 - l. Adhesive: Styrene Butadiene, Styrene Isoprene
 - m. Trade Name: Zip N Close Zippers
 - n. Material Use: Surface Protection
4. Available Sizes
- a. ZA02 Red 1.5 inches by 7 feet, 10 oz.
 - b. ZC02 Blue 2.75 inches by 7 feet, 1 lb.
5. Handling and Storage
- a. Ensure good ventilation and exhaustion at the workplace. Keep respiratory protective devices available. Store in a cool location away from fire and heat. No special handling requirements.
6. Installation
- a. Construct Temporary Dust Containment barriers using Dust Shield Pro Poles and Zip N Close adhesive zippers. Use a jobsite approved poly sheeting. To ensure a tight seal use a Dust Shield Pro Pole every 4-6 feet.

2.7 ADHESIVE TAPE

A. Builder Board Tape:

1. Description:
 - a. The perfect tape to compliment Builder Board with Liquid Shield Technology. It has an aggressive, high tack adhesive that can seam Builder Board together for months. It's strong, flexible and lays flat.
2. Product Specifications:
 - a. Available Colors: Natural
 - b. Recyclable: No
 - c. Reusable: No
 - d. Breathable: No
 - e. Adhesive: Yes
 - f. Liquid Resistant: Yes
 - g. Flame Retardant: No

B. Builder Board Breathable Tape:

1. Description:
 - a. Prevent cure lines and let vapors escape by seaming with the strong, tacky hold of Builder Board Breathable Tape.
2. Product Specifications:
 - a. Available Colors: Natural
 - b. Recyclable: Yes
 - c. Reusable: No
 - d. Breathable: Yes
 - e. Adhesive: No
 - f. Liquid Resistant: No
 - g. Flame Retardant: No

C. Drywall Mesh Tape by Surface Shields

1. Description:
 - a. Drywall mesh tape is a self-adhesive fiberglass tape. Seam drywall joints and mask for stucco application. Patch Pro tape is available in sizes ranging from 2 inches to 36 inches wide
2. Product Specifications:
 - a. Available Colors: Blue, White, Yellow
 - b. Recyclable: No

- c. Reusable: No
- d. Breathable: Yes
- e. Adhesive: Yes
- f. Liquid Resistant: No
- g. Flame Retardant: No

D. Painters Grade Blue Tape by Surface Shields

- 1. Description:
 - a. A versatile, 5 mil tape that's easy to use and conforms to a variety of surfaces. It has a synthetic rubber adhesive that peels off easily.
- 2. Product Specifications:
 - a. Available Colors: Blue
 - b. Recyclable: No
 - c. Reusable: No
 - d. Breathable: No
 - e. Adhesive: Yes
 - f. Liquid Resistant: Yes
 - g. Flame Retardant: No

E. ARMBAR PE Tape by Surface Shields

- 1. Description:
 - a. Developed for superior hold to leading competitors & engineered with exclusive quick release. Armbar pro grade poly tape is ideal for stucco, surface protection and dust containment applications.
- 2. Product Specifications:
 - a. Available Colors: Red
 - b. Tape Size: 2 in
 - c. Recyclable: No
 - d. Reusable: No
 - e. Breathable: No
 - f. Adhesive: Yes
 - g. Liquid Resistant: Yes
 - h. Flame Retardant: No
 - i. Flame Retardant: No

F. Ultrastik by Surface Shields

- 1. Description:

- a. Ultrastik is a double sided, scrim reinforced acrylic adhesive tape. It's ideal for applying base trim, mounting of vinyl, plastic and wooden molding. It's also non-toxic and bonds to most materials.
2. Product Specifications:
 - a. Available Colors: Clear
 - b. Recyclable: No
 - c. Reusable: No
 - d. Breathable: No
 - e. Adhesive: Yes
 - f. Liquid Resistant: No
 - g. Flame Retardant: No

2.8 PORTABLE JOBSITE TRASH CONTAINERS

- A. Portable Jobsite Trash Containers: Model # RBTB 16-36 Trash Box as manufactured by Ram Board. Portable, reusable jobsite trash container.
 1. Fits Trash Bags: 42 gal to 50 gal (159 L to 189 L)
 2. Recycled and Recyclable Materials: 100 percent.
 3. Unique folds for easy storage.
 4. Quick self-locking assembly, no tape required.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Examine substrates for compliance with requirements for installation. Proceed with installation or protection products only after unsatisfactory conditions have been corrected
- C. 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.

3.4 PROTECTION

- A. Protection installed products may be left in place until completion of project or adjacent work.

- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Products.
 - 2. Transportation and handling.
 - 3. Storage and protection.
 - 4. Reuse of existing materials.
 - 5. Product options.
- B. Related Sections:
 - 1. Section 012500 - Substitution Procedures.

1.2 PRODUCTS

- A. Provide interchangeable components by the same manufacturer for identical items.
- B. Do not use products containing asbestos or other known hazardous materials.
- C. Do not reuse materials and equipment removed from existing construction in completed Work, except as specifically permitted by the Contract Documents.

1.3 TRANSPORTATION AND HANDLING

- A. Coordinate delivery of Products to prevent conflict with Work and adverse conditions at site.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to ensure that Products comply with requirements of Contract Documents, are undamaged, and quantities are correct.
- D. Provide equipment and personnel to handle products by methods to prevent damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturer's instructions with manufacturer's seals and labels intact and legible.
- B. Store Products on site unless prior written approval to store off site has been obtained from Owner.
- C. Store Products subject to damage by elements in weathertight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- D. Exterior Storage:
 - 1. Store fabricated Products above ground; prevent soiling and staining.
 - 2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.

3. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
- E. Arrange storage areas to permit access for inspection. Periodically inspect stored products to verify that products are undamaged and in acceptable condition.

1.5 REUSE OF EXISTING MATERIALS

- A. Carefully remove, handle, protect, and store Products.
- B. Clean and refinish Products to original or specified condition.
- C. Restore operable components to working condition.
- D. Arrange and pay for transportation, storage, and handling of Products requiring off site storage, restoration, or renovation.

1.6 PRODUCT OPTIONS

- A. Products specified by reference standard only:
 1. Select any Product meeting the specified standard.
 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.
- B. Products specified by naming two or more acceptable Products: Select any named Product.
- C. Products specified by stating that the Contract Documents are based on a Product by a single manufacturer followed by the statement "Equivalent products by the following manufacturers are acceptable":
 1. Select the specified Product or a Product by a named manufacturer having equivalent or superior characteristics to the specified Product and meeting the requirements of the Contract Documents.
 2. If the specified Product is not selected, submit Product Data to substantiate compliance of proposed Product with specified requirements.
 3. The specified Product establishes the required standard of quality.
- D. Products specified by naming one or more Products followed by "or approved substitute" or similar statement:
 1. Submit a substitution request under provisions of Section 012500 for Products not listed.
 2. The specified Product establishes the required standard of quality.
- E. Products specified by naming one or more Products or manufacturers followed by the statement "Substitutions: Under provisions of Division 01":
 1. Submit a substitution request under provisions of Section 012500 for Products not listed.
 2. The specified Product establishes the required standard of quality.
- F. Products specified by naming one Product followed by the statement "Substitutions: Not permitted": Substitutions will not be allowed.

- G. Products specified by required performance or attributes, without naming a manufacturer or Product:
 - 1. Select any Product meeting specified requirements.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.

PART 2 PRODUCTS
Not used

PART 3 EXECUTION
Not used

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Division 02 Section "Selective Building Demolition" for demolition of selected portions of the building.
 - 2. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least ten (10) days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
 1. Fire-suppression systems.
 2. Communication systems.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 PREPARATION

- A. Examine existing conditions of work, including elements subject to movement or damage during cutting and patching.
- B. After uncovering work, examine conditions affecting installation of new products or performance of work.
- C. Provide protection for other portions of project.
- D. Provide protection from elements.

3.2 CUTTING AND PATCHING

- A. Execute cutting to include excavating, fitting, and patching of Work required to:
 1. Make several parts fit properly.
 2. Uncover work to provide for installation of ill timed work.
 3. Remove and replace defective work.
 4. Remove and replace work not conforming to requirements of Contract Documents.
 5. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

- B. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, and finishes.
- C. Execute cutting and demolition by methods that will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.
- D. Execute excavating and backfilling by methods that will prevent damage to other Work, and will prevent settlement.
- E. Employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather exposed or moisture resistant elements.
 - 2. Sight exposed finished surfaces.
- F. Restore work that has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.
- G. Refinish entire surfaces as necessary to provide an even finish:
 - 1. Continuous surfaces: To nearest intersections.
 - 2. Assembly: Refinish entirely.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Construction waste management goals, plan, and records.

1.2 WASTE MANAGEMENT GOALS

- A. Reuse, salvage, or recycle non-hazardous waste materials.
- B. Minimize waste sent to landfills and incinerators.
- C. Prioritize non-hazardous construction waste management in following order:
 1. Reduce amount of waste generated.
 2. Reuse material through on-site reuse or off-site salvaging, including sale or donation.
 3. Recycle material including diverting materials for secondary uses whenever economically feasible.
 4. Dispose of materials with no practical use or economic benefit at landfill.

1.3 WASTE MANAGEMENT

- A. Pro-actively manage construction and demolition waste:
 1. Practice efficient waste management when sizing, cutting, and installing products.
 2. Use all reasonable means to divert construction and demolition waste from landfills and incinerators, and to facilitate recycling and reuse.
 3. Return unused products and overages to supplier, or donate to non-profit group.
 4. Carefully install products; avoid removal of ill-timed and poorly installed products.
 5. Use centralized cutting areas to facilitate waste collection.
 6. Deliver, store, and handle products to prevent damage.
- B. Require subcontractors and suppliers to participate in waste management efforts.
- C. Construction waste includes:
 1. Products from demolition and removal, excluding abatement waste, excavated soil, and land-clearing debris.
 2. Excess and unusable construction products.
 3. Packaging materials for construction products.

4. Other materials generated during construction process but not incorporated into the Work.
- D. Give consideration to:
 1. Availability of viable recycling markets.
 2. Condition of materials.
 3. Ability to provide material in suitable condition and in quantities acceptable to available markets.
 4. Time constraints imposed by internal project completion mandates.
- E. Be responsible for implementation of special programs involving rebates and similar incentives related to recycling of waste.
- F. Revenues and other savings obtained for salvage and recycling accrue to Contractor.
- G. Ensure that firms and facilities used for recycling, reuse, and disposal have legal permits for intended uses.

1.4 QUALITY ASSURANCE

- A. Review and discuss waste management plan implementation and progress at Preconstruction Conference and Progress Meetings.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Designate separate areas to facilitate separation of materials for potential recycling, salvage, reuse and return.
- B. Clearly identify areas and receptacles.
- C. Keep storage areas and receptacles clean and orderly; prevent contamination of materials.
- D. Monitor storage areas; correct problems and implement preventative measures.

1.6 TRAINING

- A. Provide training of waste management methods to be used at appropriate stages of Project.
- B. Require participation of all subcontractors.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 WASTE COLLECTION

- A. Provide containers and storage areas to facilitate waste management, clearly identified.
- B. Handle recyclable materials to prevent contamination by incompatible products and materials.
- C. Separate materials by:
 1. Placing into marked separate containers, then transporting to recycling facility.

2. Placing into single container, then transporting to recycling facility for separation.

3.2 DISPOSAL

- A. Dispose of nonhazardous waste materials that cannot be reused, recycled, or salvaged at licensed landfill or incinerator.
- B. Handle, store, and dispose of hazardous wastes in accordance with applicable codes, ordinances, rules, and regulations.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Closeout procedures.
 - 2. Final cleaning.
 - 3. Adjusting.
 - 4. Project record documents.
 - 5. Operation and maintenance data.
 - 6. Warranties.
 - 7. Spare parts and maintenance materials.
 - 8. Starting of systems.
 - 9. Demonstration and instructions.

1.2 CLOSEOUT PROCEDURES

- A. Final Inspection:
 - 1. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with the Contract Documents and ready for Architect's inspection.
 - 2. If Architect performs reinspection due to failure of Work to comply with claims of status of completion made by Contractor, Owner will compensate Architect for such additional services and will deduct the amount of such compensation from final payment to Contractor.
- B. Submit final Application for Payment showing original Contract Sum, adjustments, previous payments, retainage withheld from previous payments, and sum remaining due.
- C. Closeout Submittals:
 - 1. Evidence of compliance with requirements of governing authorities.
 - 2. Certificate of Occupancy.
 - 3. Project Record Documents.
 - 4. Operation and Maintenance Data.
 - 5. Warranties.
 - 6. Keys and keying schedule.
 - 7. Spare parts and maintenance materials.
 - 8. Evidence of payment of Subcontractors and suppliers.

9. Final lien waiver.
 10. Certificate of insurance for products and completed operations.
 11. Consent of Surety to final payment.
 12. Sustainable Design Submittals.
- D. Owner will occupy all portions of the building as specified in Section 01 1100.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean surfaces exposed to view:
 1. Clean glass.
 2. Remove temporary labels, stains and foreign substances.
 3. Polish transparent and glossy surfaces.
 4. Vacuum carpeted surfaces; damp mop hard surface flooring.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain following record documents on site; record actual revisions to the Work:
 1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other Modifications to the Contract.
 5. Reviewed Shop Drawings, Product Data, and Samples.
 6. Material Safety Data Sheets.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Make entries neatly and accurately.
- E. Label each set or volume with "PROJECT RECORD DOCUMENTS", project title, and description of contents.
 1. Organize contents according to Project Manual table of Contents.

2. Provide table of contents for each volume.
 - F. Drawings: Mark each item to record actual construction including:
 1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 2. Field changes of dimension and detail.
 3. Details not on original Drawings.
 - G. Specifications: Mark each Product section description of actual Products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and Modifications.
 - H. Shop Drawings: Mark each item to record actual construction including:
 1. Field changes of dimension and detail.
 2. Details not on original Shop Drawings.
 - I. Submit one copy along with final Application for Payment.
- 1.6 OPERATION AND MAINTENANCE DATA
- A. Identify as "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.
 - B. Contents:
 1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 2. Operation and maintenance instructions: Arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 3. Project documents and certificates including:
 - a. Shop drawings and product data.
 - b. HVAC balance reports.
 - c. Certificates.

- d. Copies of warranties and bonds.
- C. Submittal:
 - 1. Submit one copy at least 15 days prior to final inspection.
 - 2. Architect will notify Contractor of any required revisions after final inspection.
 - 3. Revise content of documents as required prior to final submittal.
 - 4. Submit one copy of revised documents within 10 days after final inspection.

1.7 WARRANTIES

- A. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- B. Include Table of Contents.
- C. Submit one copy along with final Application for Payment.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.8 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site in location as directed; obtain receipt prior to final payment.

1.9 STARTING OF SYSTEMS

- A. Notify Owner and Architect at least seven days prior to startup of each system or piece of equipment.
- B. Prior to beginning startup verify that:
 - 1. Lubrication has been performed.
 - 2. Drive rotation, belt tension, control sequences, tests, meter readings, and electrical characteristics are within manufacturer's requirements.
 - 3. Utility connections and support components are complete and tested.
- C. Execute start-up under supervision of applicable manufacturer's representative or Contractor's personnel in accordance with manufacturers' instructions.
- D. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.
- E. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.10 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.

- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Utilize Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed upon times, at equipment location.
- E. Prepare and insert additional data in Operation and Maintenance Manuals when need for additional data becomes apparent during instruction.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Attention is directed to Division 0, Bidding and Contract Requirements, and to Division 1, General Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK

- A. Extent of selective demolition work is shown on drawings.
- B. Removal Work Specified Elsewhere: Cutting floors and masonry walls for piping, ducts and conduit as required.

1.3 QUALITY ASSURANCE

- A. Contractor Qualifications: Engage only subcontractors who can demonstrate not less than five years successful experience in work of similar character.
- B. Requirements for Regulatory Agencies: Comply with all applicable requirements.

1.4 SUBMITTALS

- A. Schedule: Include demolition considerations within project schedule.
- B. Report size and condition of existing foundation at east wall (location of new storefront).

1.5 PROJECT CONDITIONS

- A. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
- B. Salvage Items: Certain materials/products/fabrications are indicated to be reused or relocated. Others are to be removed but not reused or relocated; verify each with Owner. Carefully remove, clean, protect and store such items. Turn over items to be removed but not reused or relocated to Owner and obtain receipt.
- C. Protections: Provide temporary barricades and other forms of protection as required to prevent injury to people during selective demolition.
 - 1. Provide protective measures as required to provide free and safe passage of personnel.
 - 2. Provide interior and exterior shoring, bracing or support to prevent movement, settlement or collapse of structure or element to be demolished, and adjacent facilities or work to remain.
 - 3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
 - 4. Protect floors with suitable coverings when necessary.
 - 5. Provide protection of areas not under construction from dust and debris.

6. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no other water leakage or damage occurs to structure or interior areas of existing building.
 7. Remove protections at completion of work.
- D. Damages: Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.
- E. Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference's with roads, streets, walks and other adjacent occupied or used facilities.
1. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations, or directed by Owner or Architect.
- F. Explosives: Use of explosives will not be permitted.
- G. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations and perform in accordance with applicable standards.
- H. Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- I. Environmental Controls: Use temporary enclosures and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Except as otherwise indicated or approved by the Architect, provide materials for selective demolition which will result in equal-or-better work than the work being cut-and-patched in terms of performance characteristics, and including visual effect where applicable. Comply with the requirements, and use materials identical with the original materials where feasible and where recognized that satisfactory results can be produced thereby.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Prior to commencement of selective demolition work, inspect surrounding areas where selective demolition will be performed with the Owner. Photograph existing conditions including adjacent structures, related surfaces, finishes and equipment to record condition where selective demolition could cause damage, or where existing condition could be misconstrued as damage resulting from selective demolition work.

3.2 PREPARATION

- A. Provide interior and exterior shoring, bracing or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.
 - 1. Cease operations and notify the Owner's representative immediately if safety of structures appears to be endangered. Take precautions to support structures until determination is made for continuing operations.
- B. Cover and protect finishes, equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have been removed.
- C. Erect and maintain dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
- D. Provide weatherproof closures for exterior openings resulting from demolition work.
- E. Drain, purge or otherwise remove, collect and legally dispose of chemicals, gases, explosives, acids, flammables and other dangerous materials before proceeding with selective demolition work.

3.3 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with demolition schedule and governing regulations.
 - 1. Proceed with selective demolition in systematic manner, from top of structure to ground. Complete demolition work above each floor or tier before disturbing supporting members on lower levels.
 - 2. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
 - 3. Where selective demolition terminates at construction to remain, uniformly terminate demolition to provide straight lines and smooth surfaces as required for selective demolition.
 - 4. Remove structural framing members and lower to ground by hoists, derricks or other suitable methods. Do not permit demolished materials to fall to ground.
 - 5. Use means to support work to be demolished including individual demolished sections, with adequate safety factor to support any combination of potential loads.

6. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.
 7. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
 8. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.
- B. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's representative, in written, accurate detail. Pending receipt of directive from Owner's representative, rearrange selective demolition schedule as necessary to continue overall job progress without delay.
 - C. Employ only skilled tradesmen to perform selective demolition.
 - D. Cut work by methods least likely to damage work to be retained and work adjoining.
 - E. In general, where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chipping tools. Core drill openings through concrete work.
 - F. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
 - G. Restore exposed finishes of patched areas and, where necessary, extend finish restoration onto retained work adjoining in a manner which will eliminate evidence of patching.
 - H. Where selective demolition terminates at a surface, finish or substrate to remain, completely remove all traces of material selectively demolished including mortar beds. Provide smooth, even substrate transition.
 - I. Where finishes are to be removed, completely remove related attaching materials such as nails, screws and anchors. Do not damage supporting structure by removal.

3.4 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove debris, rubbish and other materials resulting from selective demolition operations from site as building demolition proceeds. Do not allow to accumulate.
 1. If hazardous materials are encountered during demolition operations, immediately stop work in the area affected and report the condition to Owner and Architect in writing. If Owner determines the hazardous materials are asbestos, PCB's or other toxic substances, do no further work in the area until the materials are either removed or rendered harmless, and the area has been certified safe by appropriate authorities.
- B. Burning of removed materials from selective demolition will not be permitted on site.
- C. Legally transport debris, rubbish and other materials resulting from selective demolition and legally dispose of off-site licensed disposal facilities.

3.5 CLEAN UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave interior areas broom clean.
- B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- C. Clean adjacent structures and improvements of dust, dirt and debris caused by demolition operations, as directed by Architect or governing authorities. Return adjacent areas to condition existing prior to the start of the work.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 03 30 00

CAST IN PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.

1.4 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."

1.5 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1.
 - 1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators.
- B. Hot-Weather Placement: Comply with ACI 301.

PART 2 PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117 .

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that 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.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.
- D. Galvanized-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from galvanized-steel wire into flat sheets.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.4 CONCRETE MATERIALS

- A. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type II,
 - 2. Fly Ash: ASTM C 618, Class F or C.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Air-Entraining Admixture: ASTM C 260/C 260M.
- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- E. Water: ASTM C 94/C 94M and potable.

2.5 VAPOR RETARDERS

- A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, no dissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, no dissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.

2.7 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.8 CONCRETE MIXTURES, GENERAL

- 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 (ACI 301M).
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

2.9 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Normal-Weight Concrete:
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.4.

3. Slump Limit: 4 inches before adding high-range water-reducing admixture or plasticizing admixture plus or minus 1 inch.
4. Air Content: 6.0 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
6. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.10 FABRICATING REINFORCEMENT

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

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 FORMWORK INSTALLATION

- 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.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEM INSTALLATION

- 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-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT INSTALLATION

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

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is 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.

3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. 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.
 - 1. Apply to concrete surfaces exposed to public view.

3.7 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 (ACI 301M) 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. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. 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. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in 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. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

3.8 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.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Concrete Lintels.
 - 3. Mortar and Grout Materials.
 - 4. Reinforcement.
 - 5. Ties and Anchors.

1.2 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For reinforcing steel. Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315.
- C. Samples for Verification: For each type and color of exposed masonry unit and colored mortar.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
 - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

1.5 FIELD CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6. Do not add calcium chloride or other salt or anti-freeze agents.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 PRODUCTS**2.1 UNIT MASONRY, GENERAL**

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions. Copy and revise "CMUs" Paragraph below for non-load-bearing CMUs (changing ASTM C 90 to ASTM C 129) if needed; they are not usually an inventory item and may have to be ordered in large quantities. Indicate load-bearing and non-load-bearing units on Drawings if both are specified.
- B. CMUs: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3050 psi.
 - 2. Density Classification: Medium weight unless otherwise indicated.
- C. Concrete Building Brick: ASTM C 55.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 3050 psi.
 - 2. Density Classification: Medium weight.

2.3 CONCRETE LINTELS

- A. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.

2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.

- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
- E. Aggregate for Mortar: ASTM C 144.
 - 1. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
 - 2. White-Mortar Aggregates: Natural white sand or crushed white stone.
 - 3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Non-chloride, non-corrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
- I. Water: Potable.

2.5 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M, Grade 60.
- B. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Interior Walls: Hot-dip galvanized carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized carbon steel.
 - 3. Wire Size for Side Rods: 0.187-inch diameter.
 - 4. Wire Size for Cross Rods: 0.148-inch diameter.
 - 5. Wire Size for Veneer Ties: 0.187-inch diameter.
 - 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 - 7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.
- D. Masonry-Joint Reinforcement for Multiwythe Masonry:
 - 1. Tab type, either ladder or truss design, with one side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe, but with at least 5/8-inch cover on outside face.
- E. Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- diameter, hot-dip galvanized carbon-steel continuous wire.

2.6 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.
 - 1. Wire: Fabricate from 3/16-inch-(4.76-mm-) diameter, hot-dip galvanized-steel wire.
- D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
 - 1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm) diameter, hot-dip galvanized-steel wire.
 - 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized-steel wire.
- E. Partition Top Anchors: 0.105-inch- (2.66-mm-) thick metal plate with a 3/8-inch- (9.5-mm-) diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.
- F. Rigid Anchors: Fabricate from steel bars 1-1/2 inches (38 mm) wide by 1/4 inch (6.35 mm) thick by 24 inches (610 mm) long, with ends turned up 2 inches (51 mm) or with cross pins unless otherwise indicated.
 - 1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.
- G. Adjustable Masonry-Veneer Anchors:
 - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
 - 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.105-inch- (2.66-mm-) thick steel sheet, galvanized after fabrication
 - 3. Fabricate wire ties from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized-steel wire unless otherwise indicated.
 - 4. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section.

5. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a gasketed sheet metal anchor section, with pronged legs of length to match thickness of insulation or sheathing and raised rib-stiffened strap to provide a slot for inserting wire tie.
6. Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except with hex washer head and neoprene or EPDM washer, No. 10 (4.83-mm) diameter, and with coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B 117.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

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

3.2 TOLERANCES

- A. Dimensions and Locations of Elements:
 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12 mm) maximum.
- C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
 2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
 3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses 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. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
 3. Bed webs in mortar in grouted masonry, including starting course on footings.
 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
- B. Lay solid 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.
- C. If another joint profile is used, revise first paragraph below or show on Drawings.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.5 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. 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 nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 - 3. Protect adjacent surfaces from contact with cleaner.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 - 6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.6 MASONRY WASTE DISPOSAL

- A. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
 - 1. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.
- B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Load-bearing steel stud wall framing.
2. Non-load-bearing steel stud wall framing.
3. Steel soffit framing.
4. Steel floor and ceiling joist framing.

B. Related Sections:

1. Division 01:General Requirements; Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. American Iron and Steel Institute (AISI) - Specification for the Design of Cold-Formed Steel Structural Members.
- B. American Society of Civil Engineers (ASCE) 7 - Minimum Design Loads for Buildings and Other Structures.
- C. American Welding Society (AWS) D1.3/D1.3M - Structural Welding Code - Sheet Steel.
- D. ASTM International (ASTM):
 1. A653/A653M Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 2. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 3. A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
 4. C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.
 5. C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
 6. C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- E. Steel Framing Industry Association (SFIA) - Member Directory.
- F. Steel Stud Manufacturer's Association (SSMA) - Member Directory.
- G. Society for Protective Coatings (SSPC) - Painting Manual.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate framing layout, components, connections, fastenings, and pertinent details.
 - 2. Product Data: Indicate framing components, sizes, materials, finishes, and accessories.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certificate from Professional Structural Engineer responsible for system design that system was designed in accordance with Contract Document requirements, applicable Building Code, and generally accepted engineering practices.
 - 2. Welder Certifications: As required by AWS D1.3/D1.3M.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Current member of SFIA or SSMA.
- B. Installer Qualifications: Minimum 5 years documented experience in work of this Section.
- C. Calculate structural properties of framing members in accordance with AISI Specifications.
- D. Design framing under the direct supervision of a Professional Structural Engineer with minimum [10] years experience in the work of this Section and licensed in the State in which the Project is located.
- E. Design joist system to withstand:
 - 1. Live and dead loads in accordance with Building Code.
 - 2. Maximum deflection under loading: $L/360$ without decking materials.
- F. Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.
- G. Welder Qualifications: AWS D1.3/D1.3M.

1.4 DELIVERY, STORAGE AND HANDLING

- A. In accordance with ASTM C1007.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Clark Steel Framing.
 - 2. Dale/Incor.
 - 3. Dietrich Metal Framing; a Worthington Industries Company.
 - 4. MarinoWare; a division of Ware Industries.

5. Super Stud Building Products, Inc.

6. Unimast, Inc

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Framing Materials:

1. ASTM A653/A653M or A1003/A1003M, galvanized sheet steel, G60 coating class.
2. Fabricate components to ASTM C955.
3. Studs and joists: SSMA stud profile, C-shaped, punched for utility access.
4. Tracks:
 - a. SSMA stud track profile, C-shaped, same gage and depth as studs, unpunched.
 - b. Top track: Deflection type, deep leg track with slotted screw holes; permit plus or minus 1/2 inch movement of overhead structure without damage to framing.
 - c. Top and bottom track: 1-1/4 inch high legs.
 - d. Rim track: Provide closure for ends of joists.

2.3 ACCESSORIES

- A. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.
- B. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.
- C. Fasteners: ASTM C1513; self-drilling, self-tapping screws.
- D. Touch Up Paint: SSPC Paint 20, Type I or II.
- E. Welding Electrodes: AWS D1.3/D1.3M; type required for materials being welded.

2.2 FABRICATION

- A. Framing components may be prefabricated using templates.
- B. Cut members square and with tight fit to adjacent framing.
- C. Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.
- D. Fabricate straight, level, and true, without warp or rack.
- E. Fabrication Tolerances: In accordance with ASTM C955.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install framing components in accordance with ASTM C1007, manufacturer's instructions, and approved Shop Drawings.

- B. Welding: In accordance with AWS D1.3/D1.3M.
- C. Make provisions for erection stresses. Provide temporary alignment and bracing.

3.1 INSTALLATION - NON-AXIALLY LOADED STUD FRAMING

- A. Place top and bottom tracks in straight lines with ends butted. Fasten tracks at maximum 12 inches on center.
- B. Place studs at spacing indicated and not more than 2 inches from abutting walls and at each side of openings.
- C. Install deflection compensating top track at framing extending to underside of structure.
- D. Connect studs to top and bottom tracks.
- E. Construct corners using minimum of three studs.
- F. Do not splice studs.
- G. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.
- H. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.
- I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- J. Laterally brace walls at locations indicated.

3.2 INSTALLATION - JOISTS

- A. Place joists at spacings indicated and not more than 2 inches from abutting walls. Connect members to supports using fastener method.
- B. Set members parallel and level; install lateral bracing and bridging where indicated.
- C. Locate joists directly over bearing studs or provide load distribution member.
- D. Provide additional joists under parallel partitions when partition length exceeds one-half of joist span and around openings that interrupt one or more joists.
- E. Do not splice joists.
- F. Provide web stiffeners at reaction points and points of concentrated loads.
- G. Provide end blocking where joist ends are not otherwise restrained from rotation.

3.3 INSTALLATION TOLERANCES

- A. In accordance with ASTM C1007.

3.4 ADJUSTING

- A. Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780, Annex A1.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 DESCRIPTION:

- A. This section specifies wood blocking, framing, sheathing, furring, nailers, sub-flooring, rough hardware, and light wood construction.

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00 Submittal Procedures.
- B. Shop Drawings showing framing connection details, fasteners, connections and dimensions.
- C. Manufacturer's Literature and Data:
 - 1. Submit data for lumber, panels, hardware and adhesives.
 - 2. Submit data for wood-preservative treatment from chemical treatment manufacturer and certification from treating plants that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 3. Submit data for fire retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 4. For products receiving a waterborne treatment, submit statement that moisture content of treated materials was reduced to levels specified before shipment to project site.
- E. Manufacturer's certificate for unmarked lumber.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protect lumber and other products from dampness both during and after delivery at site.
- B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- C. Stack plywood and other board products so as to prevent warping.
- D. Locate stacks on well drained areas, supported at least 152 mm (6 inches) above grade and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 QUALITY ASSURANCE:

- A. Installer: A firm with a minimum of three (3) years' experience in the type of work required by this section.

1.6 GRADING AND MARKINGS:

- A. Any unmarked lumber or plywood panel for its grade and species will not be allowed on VA Construction sites for lumber and material not normally grade marked, provide manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material meet the specified the specified requirements.

PART 2 PRODUCTS

2.1 LUMBER:

- A. Unless otherwise specified, each piece of lumber must bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
 - 1. Identifying marks are to be in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 - 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Structural Members: Species and grade as listed in the AFPA NDS having design stresses as shown.
- C. Lumber Other Than Structural:
 - 1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
 - 2. Framing lumber: Minimum extreme fiber stress in bending of 7584 kPa (1100 PSI).
 - 3. Furring, blocking, nailers and similar items 101 mm (4 inches) and narrower Standard Grade; and, members 152 mm (6 inches) and wider, Number 2 Grade.
 - 4. Board Sub-flooring: Shiplap edge, 25 mm (1 inch) thick, not less than 203 mm (8 inches) wide.
- D. Sizes:
 - 1. Conforming to PS 20.
 - 2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.
- E. Moisture Content:
 - 1. Maximum moisture content of wood products is to be as follows at the time of delivery to site.
 - a. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
 - b. Lumber over 50 mm (2 inches) thick: 25 percent or less.

F. Fire Retardant Treatment:

1. Comply with Mil Spec. MIL-L-19140.
2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 610 mm (24 inches) from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members provided in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with AWWA Book use category system standards U1 and T1, except any process involving the use of Chromated Copper Arsenate (CCA) or other agents classified as carcinogenic for pressure treating wood is not permitted.

2.2 PLASTIC LUMBER:

A. General:

1. Allowable loads and spans, as documented in evaluation reports or in information referenced in evaluation reports, are not to be less than design loads and spans indicated on contract documents.
2. Restricted to exterior use only.

B. All-Plastic Lumber: Shapes made from high-density polyethylene (HDPE), PVC, polystyrene, or cellular PVC with no cellulose fiber.

1. Decking Standard: ICC-ES AC174.
2. Shear Parallel to Length: Maximum 6,894 kPa (1,000 psi) in accordance with ASTM D2344/D2344M.
3. Density: ASTM D6111.
4. Compressive Strength:
 - a. Secant Modulus: Minimum 482,633 kPa (70,000 psi) in accordance with ASTM D6108.
 - b. Stress at 3 percent strain: Minimum 10,342 kPa (1,500 psi) in accordance with ASTM D6108.
 - c. Compression Parallel to Grain: Minimum 20,684 kPa (3,000 psi) in accordance with ASTM D6112.
 - d. Compression Perpendicular to Grain: Minimum 6,894 kPa (1,000 psi) in accordance with ASTM D6112.

5. Flexural Strength: Minimum 13,789 kPa (2,000 psi) in accordance with ASTM D6109.
6. Tensile Strength: Minimum 8618 kPa (1,250 psi) in accordance with ASTM D198.
7. Surface Texture: Woodgrain or Smooth.
8. Color: As indicated in the Construction Drawings.

2.3 PLYWOOD:

- A. Comply with PS 1.
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- C. Sheathing:
 1. APA rated Exposure 1 or Exterior; panel grade CD or better.
 2. Wall sheathing:
 - a. Minimum 9 mm (11/32 inch) thick with supports 406 mm (16 inches) on center and 12 mm (15/32 inch) thick with supports 610 mm (24 inches) on center unless specified otherwise.
 - b. Minimum 1200 mm (48 inches) wide at corners without corner bracing of framing.
 3. Roof sheathing:
 - a. Minimum 9 mm (11/32 inch) thick with span rating 24/0 or 12 mm (15/32 inch) thick with span rating for supports 406 mm (16 inches) on center unless specified otherwise.
 - b. Minimum 15 mm (19/32 inch) thick or span rating of 40/20 or 18 mm (23/32 inch) thick or span rating of 48/24 for supports 610 mm (24 inches) on center.
- D. Subflooring:
 1. Under finish wood flooring or underlayment:
 - a. APA Rated sheathing, Exposure 1. panel grade CD.
 - b. Minimum 15 mm (19/32 inch) thick with span rating 32/16 or greater for supports at 406 mm (16 inches) on center and 18.25 mm (23/32 inch) thick with span rating 48/24 for supports at 610 mm (24 inches) on center.
 2. Combination subflooring-underlayment under resilient flooring or carpet:
 - a. APA Rated Stud-I-Floor Exterior or Exposure 1, T and G.
 - b. Minimum 15 mm (19/32 inch) thick or greater, span rating 16, for supports at 406 mm (16 inches) on center; 18 mm (23/32 inch) thick or greater, span rating 24, for supports at 610 mm (24 inches) on center.

E. Underlayment:

1. APA rated Exposure 1 or Exterior, panel grade C-C Plugged.
2. Minimum 6 mm (1/4 inch) thick or greater over plywood subflooring // and 9 mm (3/8 inch) thick or greater over board subflooring, // unless otherwise shown.

2.4 STRUCTURAL-USE PANELS:

A. Comply with APA E30.

B. Bearing the mark of a recognized association or independent agency that maintains continuing control over quality of panel which identifies compliance by end use, Span Rating, and exposure durability classification.

C. Wall and Roof Sheathing:

1. APA Rated sheathing panels, durability classification of Exposure 1 or Exterior Span Rating of 16/0 or greater for supports 406 mm (16 inches) on center and 24/0 or greater for supports 610 mm (24 inches) on center.

D. Subflooring:

1. Under finish wood flooring or underlayment:
 - a. APA rated sheathing panels, durability classification of Exposure 1 or Exterior.
 - b. Span Rating of 24/16 or greater for supports 406 mm (16 inches).
2. Under resilient floor or carpet.
 - a. APA rated combination subfloor-underlayment grade panels, durability classification of Exposure 1 or Exterior T and G.
 - b. Span Rating of 16 or greater for supports 406 mm (16 inches) on center and 24 or greater for supports 610 mm (24 inches) on center.

E. Underlayment:

1. APA rated Exposure I.
2. Minimum 6 mm (1/4 inch) thick or greater over subfloor.

F. Wood "I" Beam Members:

1. Size and Shape as indicated in contract documents.
2. Cambered and marked "TOP UP".
3. Plywood webs: PS-1, minimum 9 mm (3/8 inch) thick, unless shown otherwise.
4. Flanges: Kiln dried stress rated dense lumber minimum 38 mm (1 1/2 inch) thick, width as indicated on contract documents.
5. Plywood web fitted into flanges and joined with ASTM D2559 adhesive to form "I" beam section unless shown otherwise.

G. Laminated Veneer Lumber (LVL):

1. Bonded jointed wood veneers with ASTM D2559 adhesive.

2. Scarf jointed wood veneers with grain of wood parallel.
3. Size as indicated on contract documents.

2.5 ROUGH HARDWARE AND ADHESIVES:

A. Anchor Bolts:

1. ASME B18.2.1 and ASME B18.2.2 galvanized, 13 mm (1/2 inch) unless shown otherwise.
2. Extend at least 203 mm (8 inches) into masonry or concrete with ends bent 50 mm (2 inches).

B. Miscellaneous Bolts: Expansion Bolts: C1D A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Provide 13 mm (1/2 inch) bolt unless shown otherwise.

C. Washers

1. ASTM F844.
2. Provide zinc or cadmium coated steel or cast iron for washers exposed to weather.

D. Screws:

1. Wood to Wood: ASME B18.6.1 or ASTM C1002.
2. Wood to Steel: ASTM C954, or ASTM C1002.

E. Nails:

1. Size and type best suited for purpose unless noted otherwise. Provide aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.
2. ASTM F1667:
 - a. Common: Type I, Style 10.
 - b. Concrete: Type I, Style 11.
 - c. Barbed: Type I, Style 26.
 - d. Underlayment: Type I, Style 25.
 - e. Masonry: Type I, Style 27.
 - f. Provide special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 32 mm (1-1/4 inches) long, 8d and deformed or annular ring shank.

F. Framing and Timber Connectors:

1. Fabricate of ASTM A653/A653M, Grade A; steel sheet not less than 1.3 mm (0.052 inch) thick unless specified otherwise. Apply standard plating to steel timber connectors after punching, forming and assembly of parts.
2. Framing Angles: Angle designed with bendable legs to provide three (3) way anchors.

3. Straps:
 - a. Designed to provide wind and seismic ties with sizes as shown or specified.
 - b. Strap ties not less than 32 mm (1-1/4 inches) wide.
 - c. Punched for fastener.
5. Joist Hangers:
 - a. Fabricated of 1.6 mm (0.063 inch) minimum thick sheet, U design unless shown otherwise.
 - b. Heavy duty hangers fabricated of minimum 2.7 mm (0.108 inch) thick sheet, U design with bent top flange to lap over beam.
6. Timber Connectors: Fabricated of steel to shapes indicated on contract drawings.
7. Joist Ties: Mild steel flats, 5 mm by 32 mm (3/16 inch by 1 1/4 inch) size with ends bent about 30 degrees from horizontal, and extending at least 406 mm (16 inches) onto framing. Punch each end for three (3) spikes.
8. Wall Anchors for Joists and Rafters:
 - a. Mild steel strap, 5 mm by 32 mm (3/16 inch by 1-1/4 inch) with wall ends bent 50 mm (2 inches), or provide 9 mm by 130 mm (3/8 inch by 5 inch) pin through strap end built into masonry.
 - b. Strap long enough to extend onto three joists or rafters, and punched for spiking at each bearing.
 - c. Strap not less than 101 mm (4 inches) embedded end.
9. Joint Plates:
 - a. Steel plate punched for nails.
 - b. Steel plates formed with teeth or prongs for mechanically clamping plates to wood.
 - c. Size for axial eccentricity, and fastener loads.
- G. Adhesives:
 1. For field-gluing plywood to lumber framing floor or roof systems: ASTM D3498.
 2. For structural laminated Wood: ASTM D2559.

PART 3 EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

- A. Conform to applicable requirements of the following:
 1. AFPA NDS for timber connectors.
 2. AITC A190.1 Timber Construction Manual for heavy timber construction.
 3. AFPA WCD1 for nailing and framing unless specified otherwise.

4. APA for installation of plywood or structural use panels.
 5. TPI for metal plate connected wood trusses.
- B. Fasteners:
1. Nails.
 - a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA WCD1 where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
 - b. Use special nails with framing connectors.
 - c. For sheathing and subflooring, select length of nails sufficient to extend 25 mm (1 inch) into supports.
 - d. Use 8d or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
 - e. Use 16d or larger nails for nailing through 50 mm (2 inch) thick lumber.
 - f. Select the size and number of nails in accordance with the Nailing Schedule except for special nails with framing anchors.
 - g. Nailing Schedule; Using Common Nails:
 1. Joist bearing on sill or girder, toe nail three (3) 8d nails or framing anchor.
 2. Bridging to joist, toe nail each end two (2) 8d nails.
 3. Ledger strip to beam or girder three (3) 16d nails under each joint.
 4. Subflooring or Sheathing:
 - a) 152 mm (6 inch) wide or less to each joist face nail two (2) 8d nails.
 - b) Subflooring, more than 152 mm (6 inches) wide, to each stud or joint, face nail three (3) 8d nails.
 - c) Plywood or structural use panel to each stud or joist face nail 8d, at supported edges 152 mm (6 inches) on center and at intermediate supports 254 mm (10 inches) on center. When gluing plywood to joint framing increase nail spacing to 305 mm (12 inches) at supported edges and 508 mm (20 inches) o.c. at intermediate supports.
 5. Sole plate to joist or blocking, through sub floor face nail 20d nails, 406 mm (16 inches) on center.
 6. Top plate to stud, end nail two (2) 16d nails.
 7. Stud to sole plate, toe nail or framing anchor. Four (4) 8d nails.
 8. Doubled studs, face nail 16d at 610 mm (24 inches) on center.

9. Built-up corner studs 16d at 610 mm (24 inches) (24 inches) on center.
 10. Doubled top plates, face nails 16d at 406 mm (16 inches) on center.
 11. Top plates, laps, and intersections, face nail two (2) 16d.
 12. Continuous header, two pieces 16d at 406 mm (16 inches) on center along each edge.
 13. Ceiling joists to plate, toenail three (3) 8d or framing anchor.
 14. Continuous header to stud, four (4) 16d.
 15. Ceiling joists, laps over partitions, face nail three (3) 16d or framing anchor.
 16. Ceiling joists, to parallel rafters, face nail three (3) 16d.
 17. Rafter to plate, toe nail three (3) 8d or framing anchor. Brace 25 mm (1 inch) thick board to each stud and plate, face nail three (3) 8d.
 18. Built-up girders and beams 20d at 812 mm (32 inches) on center along each edge.
2. Bolts:
- a. Fit bolt heads and nuts bearing on wood with washers.
 - b. Countersink bolt heads flush with the surface of nailers.
 - c. Embed in concrete and solid masonry or provide expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
 - d. Provide toggle bolts to hollow masonry or sheet metal.
 - e. Provide bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 610 mm (24 inch) intervals between end bolts. Provide clips to beam flanges.
3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
- a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
 - b. ASTM C954 for steel over 0.84 mm (0.033 inch) thick.
4. Power actuated drive pins may be provided where practical to anchor to solid masonry, concrete, or steel.
5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Provide metal plugs, inserts or similar fastening.
6. Screws to Join Wood:
- a. Where shown or option to nails.

- b. ASTM C1002, sized to provide not less than 25 mm (1 inch) penetration into anchorage member.
 - c. Spaced same as nails.
- 7. Installation of Timber Connectors:
 - a. Conform to applicable requirements of the AFPA NDS.
 - b. Fit wood to connectors and drill holes for fasteners so wood is not split.
 - c. Set sills or plates level in full bed of mortar on masonry or concrete walls.
 - 1. Space anchor bolts 1219 mm (4 feet) on centers between ends and within 152 mm (6 inches) of end. Stagger bolts from side to side on plates over 178 mm (7 inches) in width.
 - 2. Provide shims of slate, tile or similar approved material to level wood members resting on concrete or masonry. Do not use wood shims or wedges.
 - 3. Closely fit, and set to required lines.
- D. Cut notch, or bore in accordance with AFPA WCD1 passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- E. Blocking Nailers, and Furring:
 - 1. Install furring, blocking, nailers, and grounds where shown.
 - 2. Provide longest lengths practicable.
 - 3. Provide fire retardant treated wood blocking where shown at openings and where shown or specified.
 - 4. Layers of Blocking or Plates:
 - a. Stagger end joints between upper and lower pieces.
 - b. Nail at ends and not over 610 mm (24 inches) between ends.
 - c. Stagger nails from side to side of wood member over 127 mm (5 inches) in width.
- F. Floor & Ceiling Framing:
 - 1. Set with crown edge up.
 - 2. Keep framing at least 50 mm (2 inches) away from chimneys.
 - 3. Bear on not less than 101 mm (4 inches) on concrete and masonry, and 38 mm (1-1/2 inches) on wood and metal unless shown otherwise.
 - 4. Support joist, trimmer joists, headers, and beams framing into carrying members at same relative levels on joist hangers unless shown otherwise.

5. Lap and spike wood joists together at bearing, or butt end-to-end with scab ties at joint and spike to plates. Scab tie lengths not less than 203 mm (8 inches) lap on joist ends. Install wood I beam joists as indicated in contract documents.
 6. Frame openings with headers and trimmer joist. Double headers carrying more than two tail joists and trimmer joists supporting headers carrying more than one tail joist unless otherwise indicated in contract documents.
 7. Drive nails through headers into joists using two (2) nails for 50 mm by 152 mm (2 inch by 6 inch); three (3) nails for 50 mm by 203 mm (2 inch by 8 inch) and four (4) nails for 50 mm by 254 mm (2 inch by 10 inch) and over in size.
 8. Install nearest joist to double headers and spike joist to both header members before trimmer joist is installed and secured together.
 9. Doubled joists under partitions parallel with floor joists.
 10. Where joists run perpendicular to masonry or concrete, anchor every third joist to masonry or concrete with one (1) metal wall anchor. Securely spike anchors with three (3) nails to side of joist near its bottom.
 11. Anchor joists running parallel with masonry or concrete walls to walls with steel flats spaced not over 1828 mm (6 feet) apart. Extend steel flats over at least three (3) joists and into masonry 101 mm (4 inches) with ends turned 50 mm (2 inches); bolt to concrete. Set top of flats flush with top of joists, and securely nail steel flats to each joist.
 12. Hook ties at steel framing over top flange of steel members.
 13. Nonbearing partitions running parallel with ceiling joists, install solid 50 mm (2 inch) thick bridging same depth as ceiling joists cut to fit snug between joists for securing top plate of partitions. Securely spike bridging to joists. Space 1219 mm (4 feet) on center.
- H. Roof Framing:
1. Set rafters with crown edge up.
 2. Form a true plane at tops of rafters.
 3. Valley, Ridge, and Hip Members:
 - a. Size for depth of cut on rafters.
 - b. Straight and true intersections of roof planes.
 - c. Secure hip and valley rafters to wall plates by using framing connectors.
 - d. Double valley rafters longer than the available lumber, with pieces lapped not less than 1219 mm (4 feet) and spiked together.
 - e. Butt joint and scab hip rafters longer than the available lumber.
 4. Spike to wall plate and to ceiling joists except when secured with framing connectors.
 5. Frame openings in roof with headers and trimmer rafters. Double headers carrying more than one (1) rafter unless shown otherwise.

6. Install 50 mm by 101 mm (2 inch by 4 inch) strut between roof rafters and ceiling joists at 1219 mm (4 feet) on center unless shown otherwise.
- I. Framing of Dormers:
 1. Frame as indicated in contract documents, with top edge of ridge beveled to pitch of roof header.
 2. Set studs on doubled trimmer rafters.
 3. Double studs at corners of dormers.
 4. Double plate on studs and notch rafters over plate and bear at least 75 mm (3 inches) on plates.
 5. Frame opening to receive window frame or louver frame.
- J. Partition and Wall Framing:
 1. Provide 50 mm by 101 mm (2 inch by 4 inch) studs spaced 406 mm (16 inches) on centers; unless otherwise indicated on contract documents.
 2. Install double studs at openings and triple studs at corners.
 3. Installation of sole plate:
 - a. Anchor plates of walls or partitions resting on concrete floors in place with expansion bolts, one (1) near ends of piece and at intermediate intervals of not more than 1219 mm (4 feet) or with power actuated drive pins with threaded ends of suitable type and size, spaced 610 mm (2 feet) on center unless shown otherwise.
 - b. Nail plates to wood framing through subfloor as specified in nailing schedule.
 4. Headers or Lintels:
 - a. Make headers for openings of two (2) pieces of 50 mm (2 inch) thick lumber of size shown with plywood filler to finish flush with face of studs or solid lumber of equivalent size.
 - b. Support ends of headers on top of stud cut for height of opening. Spike cut stud to adjacent stud. Spike adjacent stud to header.
 5. Provide double top plates, with members lapped at least 610 mm (2-feet) spiked together.
 6. Install intermediate cut studs over headers and under sills to maintain uniformity of stud spacing.
 7. Provide single sill plates at bottom of opening unless otherwise indicated in contract documents. Toe nail to end stud, face nail to intermediate studs.
 8. Install 50 mm (2 inch) blocking for firestopping so that maximum dimension of any concealed space is not over 2438 mm (8 feet) in accordance with AFPA WCD1.
 9. Install corner bracing when plywood or structured use panel sheathing is not used.

- a. Let corner bracing into exterior surfaces of studs at an angle of approximately 45 degrees, extended completely over walls plates, and secured at bearing with two (2) nails.
 - b. Provide 25 mm by 101 mm (1 inch by 4 inch) corner bracing.
- K. Rough Bucks:
 - 1. Install rough wood bucks at opening in masonry or concrete where wood frames or trim occur.
 - 2. Brace and maintain bucks plumb and true until masonry has been built around them or concrete cast in place.
 - 3. Cut rough bucks from 50 mm (2 inch) thick stock, of same width as partitions in which they occur and of width shown in exterior walls.
 - 4. Extend bucks full height of openings and across head of openings; fasten securely with anchors specified.
- L. Subflooring:
 - 1. Subflooring may be either boards, structural-use panels, or plywood.
 - 2. Lay board subflooring diagonally, with close joints. Stagger end joints and make joints over supports. Bear each board on at least three supports.
 - 3. Provide a clearance of approximately 13 mm (1/2 inch) at masonry or concrete at walls.
 - 4. Apply plywood and structural-use panel subflooring with face grain or long dimension at right angles to the supports, with edges 6 mm (1/4 inch) apart at side joints, and 3 mm (1/8 inch) apart at end joints.
 - 5. Combination subfloor-underlayment:
 - a. Space edges 3 mm (1/8 inch) apart.
 - b. Provide a clearance of 6 mm (1/4 inch) at masonry on concrete at walls.
 - 6. Stagger panel end joints and make over support.
- M. Underlayment:
 - 1. Where finish flooring of different thickness is used in adjoining areas, provide underlayment of thickness required to bring finish flooring surfaces into same plane.
 - 2. Apply to dry, level, securely nailed, clean, wood subfloor without any projections.
 - 3. Plywood and particle underlayment are to be glue-nailed to subfloor.
 - 4. Butt underlayment panels to a light contact with a 1 mm (1/32 inch) space between plywood or hardboard underlayment panels and walls, and approximately 9 mm (3/8 inch) between particleboard underlayment panels and walls.

5. Stagger underlayment panel end joints with respect to each other and offset joints with respect to joints in the subfloor at least 50 mm (2 inches).
 6. After installation, avoid traffic on underlayment and damage to the finish surface.
- N. Sheathing:
1. Provide plywood or structural-use panels for sheathing.
 2. Lay panels with joints staggered, with edge and ends 3 mm (1/8 inch) apart and nailed over bearings as specified.
 3. Set nails not less than 9 mm (3/8 inch) from edges.
 4. Install 50 mm by 101 mm (2 inch by 4 inch) blocking spiked between joists, rafters and studs to support edge or end joints of panels.
 5. Match and align sheathing which is an extension of work in place to existing.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
- B. Related Sections:
 - 1. Division 01: General Requirement; Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. A653/A653M Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - 3. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 4. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
 - 5. F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55 and 105 KSI Yield Strength.
- B. National Institute of Standards and Technology (NIST) - Product Standard PS 20 - American Softwood Lumber Standard.
- C. Northeastern Lumber Manufacturers Association (NELMA) - Standard Grading Rules for Northeastern Lumber.
- D. National Lumber Grades Authority (NLGA) - Standard Grading Rules for Canadian Lumber.
- E. Southern Pine Inspection Bureau (SPIB) - Standard Grading Rules for Southern Pine Lumber.

1.3 QUALITY ASSURANCE

- A. Lumber Grading Agency: Certified to NIST PS 20.
- B. Identify lumber and sheet products by official grade mark.
- C. *Fire Retardant Treated Products: Bear label of recognized independent testing laboratory indicating flame spread rating of 25 or less, tested to ASTM E84.*

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials minimum 6 inches above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation.
- B. Do not store seasoned or treated materials in damp location.
- C. Protect edges and corners of sheet materials from damage.

1.5 WARRANTIES

- A. Provide manufacturer's 10 year warranty against rot and termite damage for composite wood.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Sheathing:
 - 1. Georgia Pacific.
 - 2. Weyerhaeuser.
 - 3. LP.
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Sheet Products:
 - 1. Type: APA Plywood.
 - 2. Panel grade:
 - a. Wall sheathing: APA Rated Sheathing.
 - 3. Exposure:
 - a. Exterior applications: Exposure 1.
 - b. Interior applications: Interior.

2.3 ACCESSORIES

- A. Fasteners:
 - 1. Type and size: As required by conditions of use.
 - 2. Exterior locations and treated products: Hot-dip galvanized steel, ASTM A153/A153M, G90 coating class.
 - 3. Other interior locations: Plain steel.
- D. Metal Connectors and Joist Hangers:
 - 1. Galvanized steel, ASTM A653/A653M, G90 coating class.
 - 2. Size and shape: As specified in drawings.
- E. Subflooring Adhesive:
 - 1. Waterproof, water based, air cure type, in cartridge dispensers.

F. Sill Gasket: 1/4 inch thick, plate width, closed cell polyethylene or urethane foam from continuous rolls.

G. Termite Shield: Galvanized sheet steel, minimum 26 gage.

PART 3 EXECUTION

3.1 INSTALLATION

A. Set members level, plumb, and rigid.

B. Make provisions for erection loads, and for temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Place beams, joists, and rafters with crown edge up.

D. Construct load bearing framing members full length without splices.

E. Wall Sheathing:

1. Place panels perpendicular to framing members, with ends over firm bearing and staggered.

2. If diagonal corner braces are not installed, at corners, place sheathing for a horizontal distance of 48 inches.

3. Leave 1/8 inch expansion space at panel ends and edges.

4. Secure to supports with screws spaced maximum 6 inches on center along edges and maximum 12 inches on center in field of panels.

O. Provide blocking, nailers, grounds, furring, and other similar items required to receive and support work.

Q. Treat field cuts and holes in preservative treated members providing structural support in accordance with AWP A M4.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 06 20 00

FINISH CARPENTRY

PART 1 GENERAL

1.1 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures.
- B. Section 01 60 00 – Product Requirements.
- C. Section 01 74 19 – Construction Waste Management.
- D. Section 06 06 20 – Decorative Plastic Laminates.
- E. Section 09 91 00 – Painting.

1.2 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI A208.1, Particleboard.
 - 2. ANSI A208.2, Medium Density Fiberboard (MDF).
 - 3. ANSI/HPVA HP-1, American National Standard for Hardwood and Decorative Plywood.
- B. Architectural Woodwork Institute (AWI).
- C. Environmental Protection Agency (EPA)

1.3 QUALITY ASSURANCE

- A. Plywood, particleboard, OSB and wood based composite panels to ANSI standards.

1.4 SUBMITTALS

- A. Indicate details of construction, profiles, jointing, fastening and other related details.
- B. Indicate materials, thicknesses, finishes and hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, store and protect materials in accordance with Section 01 60 00 – Product Requirements.
- B. Protect materials against dampness during and after delivery.
- C. Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

PART 2 PRODUCTS

2.1 PANEL MATERIAL

- A. Panel materials to be urea-formaldehyde free.
- B. Hardwood Veneer Plywood to be stocked by the manufacturer in compliance with ANSI/HPVA HP-1.
- C. Hardboard Paneling, to be interior factory finished and to comply with ANSI/AHA 135.5.

2.2 FASTENERS FOR INTERIOR FINISH CARPENTRY

- A. Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
- B. Where Galvanized finish is indicated, provide fasteners and anchorage with hot-sip galvanizes coating complying with ASTM A 153/A 153M.
- C. Paneling Adhesives: Comply with paneling manufacturer's written recommendations for adhesives. Use adhesive that has a VOC content of 50 G/L or less when calculated according to 40 CFR 59, subpart D (EPA Method 24)

2.3 MDF PANELING

- A. Select and arrange panels on each wall to minimize noticeable variations in grain character and color between adjacent panels.
- B. Leave 1/8-inch (6-MM) gap to be covered with trim at top, bottom, and openings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- B. Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.
- C. Form joints to conceal shrinkage.
- D. Install MDF Panels with uniform tight joints between panels.

3.2 CONSTRUCTION

- A. Fastening.
 - 1. Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - 2. Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - 3. Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.
 - 4. Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- B. Standing and running trim.
 - 1. Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitered joints.
 - 2. Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
 - 3. Make joints in baseboard, where necessary using a 45° scarf type joint.

4. Install door and window trim in single lengths without splicing.
- C. Shelving.
 1. Install shelving on shelf brackets, where indicated.
- D. Paneling:
 1. Secure paneling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in color.
 2. Secure paneling and perimeter trim using concealed fasteners.
 3. Secure paneling and perimeter trim using counter sunk screws plugged with matching wood plugs.
- E. Handrails, wall rails and bumper rails.
 1. Install handrails, wall rails and bumper rails in locations indicated.
 2. Make joints hair line, dowelled and glued.
 3. Install support brackets as required.
 4. Install brackets at ends and at 600 mm on center minimum at intermediate spacing's.
 5. Install metal backing plates between studs at bracket locations to ensure proper support for brackets and bolts or self-tapping screws.
 6. Secure using counter sunk screws plugged with matching wood plugs.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 06 41 00

ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Special fabricated cabinet units.
 - 2. Plastic laminate countertops.
 - 3. Shop finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 066116 - Solid Surfacing Fabrications.
 - 3. Section 079200 - Joint Sealers.

1.2 REFERENCES

- A. Architectural Woodwork Institute/Architectural Woodwork Manufacturers of Canada/Woodwork Institute (AWI/AWMAC/WI) - Architectural Woodwork Standards.
- B. Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA) LD-3 - High Pressure Decorative Laminates.
- C. Forest Stewardship Council (FSC) STD-40-004 - Chain of Custody Standard.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Include dimensioned plan, sections, elevations, and details, including interface with adjacent work.
 - b. Designate wood species and finishes.
 - 2. Samples:
 - a. 3 x 3 inch plastic laminate samples showing available colors and finishes.
 - b. Each hardware component.
 - c. 6 inch long lumber samples [for transparent finish].
 - d. 12 x 12 inch sheet product samples [for transparent finish].

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications:
 - 1. Minimum 5 years experience in work of this Section.
 - 2. Certified under AWI/AWMAC/WI Quality Certification Program

1.5 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until proper protection can be provided, and until needed for installation.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of casework:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 43 to 70 percent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Cabinets:
 - 1. Schrock. (www.schrock.com)
- B. Acceptable Manufacturers - Plastic Laminate:
 - 1. Formica Corp. (www.formica.com)
 - 2. Wilsonart International, Inc. (www.wilsonart.com)
- C. Substitutions: Not permitted.

2.2 MATERIALS

- A. Sheet Products:
 - 1. Graded in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 4 requirements for quality grade specified.
 - 2. Exposed and semi-exposed veneers: as specified in Drawings for species, cut, and quality.
 - 3. Sheet core: Medium density fiberboard.
- B. Lumber:
 - 1. Graded in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 3 requirements for quality grade specified, average moisture content of [6] [] percent.
 - 2. Exposed and semi-exposed locations as specified in Drawings for species, cut, and quality.
- C. Hardboard: Pressed wood fiber with resin binder; standard grade, ¼ inch thick, smooth one side.
- D. Plastic Laminate: NEMA LD-3.
 - 1. High pressure decorative laminate:
 - a. Horizontal surfaces:
 - i. Backing sheet: Grade BKH.
 - ii. Postformed surfaces: Grade HGP.

- iii. Acid resisting: Grade LGP.
- iv. Other surfaces: Grade HGS.
- b. Vertical surfaces:
 - i. Backing sheet: Grade BKH.
 - ii. Cabinet liner: Grade CLS.
 - iii. Other surfaces: Grade VGP.
- 2. Low pressure decorative laminate: Grade VGL.
- 3. Colors: To be selected from manufacturer's full color range.
- 4. Finish: Matte.

2.3 ACCESSORIES

- A. Solid Surfacing Countertops: Specified in Section 066116.
- B. Fasteners: Type and size as required by conditions of use.
- C. Adhesives:
 - 1. Waterproof, water based type, compatible with backing and laminate materials.
 - 2. Maximum volatile organic compound (VOC) content: 70 grams per liter.
- D. Joint Sealers: Specified in Section 079200.

2.4 FABRICATION

- A. Cabinets - Laminate Finish:
 - 1. Quality: AWI/AWMAC/WI Architectural Woodwork Standards, Section 10, Custom Grade.
 - 2. Construction type: Frameless.
 - 3. Interface style: Overlay.
 - 4. Semi-exposed surfaces: High pressure decorative laminate.
 - 5. Fit exposed and semi-exposed edges with matching laminate edging.
 - 6. Fabricate drawer bodies to full depth of drawer fronts less ½ inch.
 - 7. Door style: Aspen
 - 8. Finish: High Gloss White
- B. Shop assemble for delivery to project site in units easily handled.
- C. Prior to fabrication, field verify dimensions to ensure correct fit.
- D. Apply plastic laminate in full uninterrupted sheets; fit corners and joints to hairline. Slightly bevel arises. Apply laminate backing sheet to reverse side of laminate faced surfaces.
- E. Where field fitting is required, provide ample allowance for cutting. Provide trim for scribing and site conditions.

PART 3 PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition cabinets to average humidity that will prevail after installation.

3.2 INSTALLATION

- A. Install in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
- B. Set plumb, rigid and level.
- C. Scribe to adjacent construction with maximum 1/8 inch gaps.
- D. Adhere countertops, splashes, and skirts with beads of adhesive.
- E. Fill joints between cabinets, splashes, and adjacent construction with joint sealer as specified in Section 079200; finish flush.

END OF SECTION

SECTION 06 46 00

WOOD TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior wood trim.
 - 2. Shop finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. American Wood Protection Association (AWPA) U1 - Use Category System - User Specification for Treated Wood.
- B. Architectural Woodwork Institute/Architectural Woodwork Manufacturers of Canada/Woodwork Institute (AWI/AWMAC/WI) - Architectural Woodwork Standards.
- C. ASTM International (ASTM) E84 - Standard Test Method for Surface Burning Characteristics of Materials.
- D. Forest Stewardship Council (FSC) STD-40-004 - Chain of Custody Standard.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Include dimensioned plans, sections, elevations, and details, including interface with adjacent work.
 - b. Designate wood species and finishes.
 - 2. Samples: 6 inch long samples of each profile.
- B. Sustainable Design Submittals:
 - 1. Materials Reuse.
 - 2. Regional Materials.
 - 3. Low-Emitting Materials.
 - 4. Certified Wood.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications:
 - 1. Minimum 5 years documented experience in work of this Section.
 - 2. Certified under AWI/AWMAC/WI Quality Certification Program.
- B. Mockups:

1. Size: [8] feet long.
 2. Show: Each trim profile.
 3. Locate where directed.
 4. Approved mockup may remain as part of the Work.
- C. Pre-Installation Conference:
1. Convene [2] weeks prior to beginning work of this Section.
 2. Attendance: Architect, Contractor, installer, and related trades.
 3. Review, discuss and resolve:
 - a. Critical dimensions.
 - b. Product delivery and storage.
 - c. Staging and sequencing.
 - d. Protection of completed work.
- D. Fire Retardant Treated Products: Bear label of recognized independent testing laboratory indicating flame spread rating of 25 or less, tested to ASTM E84.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until proper protection can be provided, and until needed for installation.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of interior trim:
1. Temperature: 60 to 80 degrees F.
 2. Humidity: 43 to 70 percent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. Cali Bamboo. (www.calibamboo.com)
 2. Substitutions: Not Permitted

2.2 MATERIALS

- A. Wood Planks
1. Quality: AWI/AWMAC/WI Architectural Woodwork Standards, Section 3, Custom Grade.
 2. Style: Standard T&G
 3. Finish: Java

2.3 ACCESSORIES

- A. Fasteners: Type and size as required by conditions of use; plain steel for interior use; hot dip galvanized steel for exterior use.

B. Adhesives:

1. Waterproof, [water based] [solvent release] type, compatible with trim and substrate materials.
2. Maximum volatile organic compound (VOC) content: 30grams per liter.

2.4 FABRICATION

- A. Quality: AWI/AWMAC/WI Architectural Woodwork Standards, Section 6, Premium Grade.
- B. Where field fitting is required, provide ample allowance for cutting.
- C. Groove back of trim applied to flat substrate, except do not groove exposed ends.
- D. Preservative Treatment:
 1. Treat wood in accordance with AWWPA U1:
 - a. Interior locations protected from moisture sources: Category UC1 - Interior/Dry.
 - b. Interior locations in contact subject to sources of moisture: Category UC2 - Interior/Damp.
- E. Fire Retardant Treatment; treat wood in accordance with AWWPA U1:
 1. Interior locations: Category UCFA - Fire Retardant/Interior.
 2. Exterior locations: Category UCFB - Fire Retardant/Exterior.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition wood to average humidity that will prevail after installation.
- B. Back prime wood installed against masonry or cementitious materials prior to installation.

3.2 INSTALLATION

- A. Install in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
- B. Install in longest practical lengths.
- C. Set plumb and level.
- D. Miter ends, corners, and intersections.
- E. Scribe to adjacent construction with maximum 1/8 inch gaps.
- F. [Fasten] [Adhere] to supporting construction.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 066116

SOLID SURFACING FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surfacing countertops.

B. Related Sections:

1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 079200 - Joint Sealers.

1.2 REFERENCES

- A. ASTM International (ASTM) E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Submittals for Review:

1. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.
2. Product Data: Indicate product description, fabrication information and compliance with specified performance requirements.
3. Samples: 2 x 2 samples showing available colors.

B. Closeout Submittals:

1. Maintenance Data: Include recommended cleaning materials and procedures and damage repair.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Minimum 5 years experience in work of this Section.
- B. Fire Hazard Classification: Class A flame spread/smoke developed rating, tested to ASTM E84.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

1. LG Hausys Hi-Macs. (<http://www.lghimacsusa.com>)

B. Substitutions: Not permitted.

2.2 MATERIALS

A. Solid Surfacing:

1. Material: Hi-Macs solid surface
2. Thickness: 1-1/2 inch.

3. Color: Moondust G160

4. Surface finish: Satin.

2.3 ACCESSORIES

A. Adhesive:

1. Type recommended by solid surfacing manufacturer.

2. Maximum volatile organic compound (VOC) content: 70 grams per liter.

B. Joint Sealer: Specified in Section 079200.

2.4 FABRICATION

A. Fabricate components in shop to sizes and shapes indicated, in accordance with manufacturer's instructions and approved Shop Drawings.

B. Fabricate splashes and skirts from solid surfacing in color to match countertops.

C. Form joints to be inconspicuous in appearance and without voids. Join pieces with adhesive.

D. Provide holes and cutouts for mounting of sinks, trim, and accessories.

E. Finish exposed edges to smooth, uniform square profile.

F. Allowable Tolerances:

1. Maximum variation in size: 1/8 inch.

2. Maximum variation in location of openings: 1/8 inch from indicated location.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved Shop Drawings.

B. Set plumb, level, and rigid.

C. Adhere countertops, splashes, and skirts with beads of adhesive.

D. Seal perimeter with joint sealer as specified in Section 079200. Finish smooth and flush.

E. Allowable Tolerances:

1. Maximum variation from level and plumb: 1/8 inch in 10 feet, noncumulative.

2. Maximum variation in plane between adjacent pieces at joint: Plus or minus 1/32 inch.

3.2 ADJUSTING

A. Sand out minor scratches and abrasions.

3.3 PROTECTION

A. Protect surfaces from damage with nonstaining coverings.

END OF SECTION

SECTION 07 10 00

DAMPPROOFING AND WATERPROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fluid-applied dampproofing.
- B. Fluid-applied waterproofing.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete
- B. Section 04 20 00 - Unit Masonry.
- C. Section 07 92 00 - Joint Sealers.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM C836 - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
 - 2. ASTM D412 - Tests for Rubber Properties in Tension
 - 3. ASTM E96 - Water Vapor Transmission of Materials.
- B. Federal Specifications:
 - 1. SS-C-153 - Cement, Bituminous, Plastic.
 - 2. SS-W-110 - Water-Repellent Colorless, Silicone Resin Base.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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. Warranty: Submit a sample warranty identifying the terms and conditions stated in Warranty article.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Applicator shall be experienced in applying the same or similar materials.
- B. Regulatory Requirements: Comply with applicable codes, regulations, ordinances, and laws regarding use and application of products that contain volatile organic compounds (VOC).

1.6 PRE-INSTALLATION MEETINGS

- A. Pre-Installation Conference: Prior to beginning work, convene a conference to review conditions, installation procedures, schedules and coordination with other work.
- B. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original, factory-sealed, unopened containers bearing manufacturer's name and label intact and legible with following information.
 - 1. Name of material.
 - 2. Manufacturer's stock number and date of manufacture.
- B. Store materials in protected and well ventilated area. Handle materials to avoid damage.
- C. PROJECT CONDITIONS
 - 1. Do not apply when surface temperature or weather conditions conflict with manufacturer's published requirements.
 - 2. Coordinate waterproofing work with other trades.
 - 3. Keep flammable products away from spark or flame. Do not allow the use of spark producing equipment during application and until all vapors have dissipated. Post "NO SMOKING" signs.
 - 4. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

- A. Warranty: Provide manufacturer's standard limited material warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Karnak Corp., which is located at: 330 Central Ave.; Clark, NJ 07066; Toll Free Tel: 800-526-4236; Tel: 732-388-0300; Fax: 732-388-9422; Email:[request info \(info@karnakcorp.com\)](mailto:info@karnakcorp.com); Web:www.karnakcorp.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 DAMPPROOFING

- A. 920AF Fibered Emulsion Mastic: Trowel grade, general purpose coating. Manufactured with refined asphalt, clay emulsifiers, and selected non-asbestos fibers.
1. Cures to a tough, flexible, durable finish and will resist variations in temperature and weather.
 2. Low odor coating.
 3. May be applied to slightly damp surfaces.
 4. ASTM D1227, Type II, Class I.
 5. ASTM D1187, Type I.
 6. SS-R-1781.
 7. MIL-R-3472A.
 8. Coverage Rate: 4 to 6 gallons per 100 square feet.
 9. Solids by Weight: 52 percent, nominal.
 10. Solids by Volume: 49 percent, nominal.
 11. Color: Black.
 12. Permeance: 0.5 perms.
 13. Cure Time: 24 to 48 hours at 77 degrees F and 50 percent Relative Humidity.
 14. Service Temperature (Cured Film): -5 to 180 degrees F.
 15. Fabric Reinforcing: Karnak #31 Fiber Glass Membrane.

- B. 83AF Fibered Dampproofing: Brush or spray applied, solvent based asphalt compound. Manufactured with selected asphalts, mineral fibers, stabilizers and mineral spirits.
1. Dries to a tough, flexible, durable finish and will resist variations in temperature and conditions.
 2. Excellent resistance to acids and alkalies in the soil and the environment.
 3. ASTM D4479, Type I.
 4. SS-A-694d.
 5. Coverage Rate: 4 gallons per 100 square feet.
 6. Solids by Weight: 72 percent.
 7. Solids by Volume: 65 percent.
 8. Color: Black.
 9. Permeance: 0.25 perms.
 10. Cure Time: 24 to 48 hours at 77 degrees F and 50 percent Relative Humidity.
 11. Service Temperature (Cured Film): 15 to 150 degrees F.
- C. 86AF Fibered Trowel Mastic: Trowel grade, manufactured from a blend of selected asphalts, fibers, stabilizers, fillers and solvents.
1. Dries to a tough, flexible, durable finish and will resist variations in temperature and conditions.
 2. Excellent resistance to most acids, alkalies, and salts.
 3. ASTM D4586, Type I (Non-Asbestos).
 4. Federal Specification SS-C-153, Type I (except Asbestos-Free).
 5. Coverage Rate: 5 to 6 gallons per 100 square feet.
 6. Solids by Weight: 74 percent.
 7. Solids by Volume: 67 percent.
 8. Color: Black.
 9. Permeance: 0.25 perms.
 10. Cure Time: 24 to 48 hours at 77 degrees F and 50 percent Relative Humidity.

11. Service Temperature (Cured Film): 15 to 160 degrees F.
- D. 112AF Foundation and Roof Coating: Brush or spray applied, non-fibered asphalt coating.
1. Dries to a tough, flexible, durable finish.
 2. Coverage Rate for Foundation Walls: 1 to 1-1/2 gallons per 100 square feet.
 3. Coverage Rate for Roofs: 1 to 2 gallons per 100 square feet.
 4. Solids by Weight: 70 percent.
 5. Solids by Volume: 64 percent.
 6. Color: Black.
 7. Cure Time: 8 to 24 hours at 77 degrees F and 50 percent Relative Humidity.
 8. Service Temperature (Cured Film): -40 to 180 degrees F.

2.3 WATERPROOFING

- A. 192 One-Kote: Single component, elastomeric waterproofing membrane, polyurethane with bitumen modifiers.
1. Single Layer Dry Film Thickness: 60 mils.
 2. High-Build Multi-Layer Dry Film Thickness: 90 mils.
 3. High-Build Multi-Layer Dry Film Thickness: 120 mils.
 4. ASTM C836.
 5. Coverage Rate: 4 gallons per 100 square feet.
 6. Shore Hardness, ASTM C836: 85.
 7. Elongation, ASTM D412: 600 percent.
 8. Tensile Strength, ASTM D412: 50 PSI.
 9. Water Vapor Permeance, ASTM E96: 0.1 perm.
 10. Heat Aging, ASTM C836: No Cracking.
 11. Crack Bridging, ASTM C836: Pass (10 cycles).
 12. Adhesion, ASTM C836: 5 lbs/in.

13. Solids: Minimum 90 percent.
14. Color: Black.
- B. 229AR Elastomeric Waterproofing: Single component, rubber reinforced asphalt that forms a highly elastomeric waterproof coating as well as an air barrier.
 1. Dry film thickness: 40 mils.
 2. Excellent resistance to acids, alkalies, and salts.
 3. ASTM D4586, Type I.
 4. ASTM D4479, Type I.
 5. Complies with Chapter 13 of Massachusetts Energy Code.
 6. Coverage Rate: 4 to 5 gallons per 100 square feet.
 7. Hardness, ASTM D2240: 55.
 8. Elongation, ASTM D412: 700 percent.
 9. Tensile Strength, ASTM D412: 400 PSI.
 10. Water Vapor Permeance, ASTM E96: 0.017 perm.
 11. Air Permeability: 0.000 L/s.m² at 75pa pressure difference.
 12. Solids, Trowel, ASTM D2967: 70 percent.
 13. Solids, Brush, ASTM D2967: 63 percent.
 14. Solids, Spray, ASTM D2967: 60 percent.
 15. Color: Black.
 16. VOC Content: 300 g/L.
 17. Chemical Resistance:
 - a. Salt Fog Resistance, 1/16 cured film: 500 hours - excellent.
 - b. Abrasion Resistance: Excellent.
 - c. Resistance to Acid: 60 days - excellent.
 - d. 10 percent HCL: Excellent.
 - e. 10 percent H₂SO₄: Excellent.

- f. 10 to 85 percent Phosphoric: Good.
 - g. Nitric Acid: Not Recommended.
 - h. Resistance to Alkalies: 60 days - excellent.
 - i. 10 percent NA OH: Excellent.
 - j. 45 percent Ammonium Nitrate: Excellent.
 - k. 10 percent Ammonium Sulfate: Excellent.
- C. 88R Rubberized Waterproofing: Spray applied, solvent based elastomeric asphalt compound, manufactured with selected asphalts, stabilizers and mineral spirits.
 - 1. Dry film thickness: 33 mils.
 - 2. Excellent resistance to acids, alkalies, and salts.
 - 3. ASTM D4479, Type I.
 - 4. Federal Specification SS-A-694d.
 - 5. Complies with Chapter 13 of Massachusetts Energy Code.
 - 6. Coverage Rate: 4 gallons per 100 square feet.
 - 7. Elongation, ASTM D412: 550 to 600 percent.
 - 8. Tensile Strength, ASTM D412: 150 PSI.
 - 9. Water Vapor Permeance, ASTM E96: 0.026 perm.
 - 10. Air Permeability: 0.001 L/s.m2 at 75pa pressure difference.
 - 11. Solids by Weight: 57.3 percent.
 - 12. Solids by Volume: 51.3 percent.
 - 13. Color: Black.
 - 14. Cure Time: 24 to 48 hours at 77 degrees F and 50 percent Relative Humidity.
 - 15. Chemical Resistance:
 - a. Acids: Excellent.
 - b. Alkaline: Excellent.
 - c. Salts: Excellent.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Before work is started, applicator shall thoroughly examine all surfaces for any deficiencies.
- B. Notify Architect in writing of any defects.

3.2 SURFACE PREPARATION

- A. Surface should be free of oil, grease, dirt, laitance and loose material.
- B. Repair all cracks and holes as recommended by Manufacturer, before applying surface coating.

3.3 APPLICATION

- A. Comply with manufacturer recommendations and approved submittals. Mix as recommended by manufacturer.
- B. For fabric reinforced applications, apply first coat. Apply reinforcing fabric over the wet coating, overlapping all edges. Smooth out all wrinkles, to ensure there is no trapped air beneath fabric. Apply second coat.

END OF SECTION

SECTION 07 21 13

BOARD INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Board insulation at exterior walls, at perimeter of foundation walls, and under concrete slabs.

B. Related Sections:

1. Division 01: General Requirements; Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. ASTM International (ASTM):

1. C578 - Standard Specification for Rigid Cellular Polystyrene Thermal Insulation.
2. C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
3. C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
4. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
5. E96/E96M - Standard Test Method for Water Vapor Transmission of Materials.
6. E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

1.3 SUBMITTALS

A. Submittals for Review:

1. Product Data: Indicate product composition and performance characteristics.

1.4 QUALITY ASSURANCE

A. Fire Hazard Classification:

1. Noncombustible, tested to ASTM E136.
2. Maximum flame spread/smoke developed rating of 75/450, tested to ASTM E84.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store insulation in clean, dry, sheltered area, off ground or floor, until used. Protect against wetting and moisture absorption.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Acceptable Manufacturers - Polystyrene Insulation:
 - 1. Dow Chemical Co. (www.dowbuildingmaterials.com)
 - 2. Owens Corning. (www.owenscorning.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Board Insulation:
 - 1. ASTM C578, closed cell extruded polystyrene foam.
 - 2. Minimum compressive strength: 40 PSI.
 - 3. Water vapor permeance: Maximum 1.5 perms for 1 inch thickness, tested to ASTM E96/E96M.

2.3 ACCESSORIES

- A. Adhesive: Type recommended by insulation manufacturer
- B. Tape: Minimum 2 inches wide, pressure sensitive, waterproof.
- C. Impale Fasteners:
 - 1. Steel impaling fasteners on metal base with lock washers, length to suit insulation thickness.
 - 2. Adhesive: Type recommended by fastener manufacturer.
- D. Metal Clips: Galvanized steel, L-shaped, 2 inches long.
- E. Fasteners: Type best suited to application, hot-dip galvanized or fluoropolymer coated steel.

PART 3 EXECUTION**3.1 PREPARATION**

- A. Substrate:
 - 1. Remove protrusions flush with adjacent surface.
 - 2. Remove dirt, dust, oil, grease, and other materials that could impair adhesion.

3.2 INSTALLATION

- A. Apply adhesive in continuous beads.
- B. Install boards on foundation wall vertically.
- C. Place boards in a method to maximize contact bedding.
- D. Stagger side joints.
- E. Butt edges and ends tight to adjacent boards, at perimeter, and around penetrations with maximum 1/4 inch gaps.

- F. Extend boards over control joints, unbonded to foundation 12 inches on one side of joint.

END OF SECTION

[THIS PAGE LEFT INTENTIONALLY BLANK]

SECTION 07 21 16

BLANKET INSULATION

PART 1 GENERAL

1.1 SCOPE

- A. Provide all of the labor, materials, equipment, and services to furnish and install the batt insulation.

1.2 DELIVERY

- A. Deliver materials in original packages, containers, or bundles bearing manufacturer's labels. Labels shall indicate brand name and descriptive data confirming compliance with requirements herein specified.

1.3 PROTECTION

- A. Keep materials dry, protected against moisture, weather, and damage.

PART 2 PRODUCTS

2.1 UN FACED BATT INSULATION

A. Description:

- 1. Mineral or fiber glass composition conforming to ASTM C665, Type I.
- 2. Non-combustible:
 - a. Flame spread: 15.
 - b. Smoke developed: 0.

B. Thermal resistance:

- 1. 3-5/8": R-13.

2.2 ACCESSORIES

- A. Nails and staples: Steel wire, galvanized, type and size to suit application.
- B. Tape: Polyethylene or polyester, self-adhering type, 2" wide.
- C. Insulation fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install insulation in accordance with the manufacturer's printed instructions without gaps or voids.
- B. Trim insulation to neatly and tightly fit spaces. Use batts free of damage.
- C. Install in the number of layers necessary to achieve the required "R" value.

- D. Physically and permanently attach batts to framing so as to prevent downward slippage of batt. Use wire or metal straps to hold insulation in place. Support relying on friction alone will not be allowed.
- E. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- F. The completed installation of surrounding construction shall totally conceal this insulation. Do not leave exposed to view or possible invasion of fire.

3.2 CLEAN UP

- A. When work is completed in each area, remove debris, equipment, and excess material and leave area broom clean.

END OF SECTION

SECTION 072800

MOISTURE BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sheet materials for controlling moisture movement at exterior wall assemblies.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. D41 - Standard Test Method for Rubber Properties in Tension.
 - 2. D226 - Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Waterproofing.
 - 3. D412 - Standard Test Method for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
 - 4. D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - 5. E96/E96M - Standard Test Method for Water Vapor Transmission of Materials.
 - 6. E331 - Standard Test Method for Water Penetration of Exterior Windows, Doors, and Curtain Walls by Uniform Static Air Pressure Differential.
 - 7. E2178 - Standard Test Method for Air Permeance of Building Materials.
 - 8. E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

1.3 QUALITY ASSURANCE

- A. Provide continuous barrier to moisture infiltration, air infiltration and exfiltration, and water vapor transmission, flashed to discharge incidental condensation and water penetration.
- B. Mockup:
 - 1. Construct mockup of typical exterior wall, full height.
 - 2. Incorporate back-up construction, moisture barrier, typical opening, flashings, and critical junctions.
 - 3. Locate in coordination with Architect.
 - 4. Approved mockup may remain as part of the Work.
- C. Pre-Installation Conference:
 - 1. Convene at site 2 weeks prior to beginning work of this Section.
 - 2. Attendance: Architect, Contractor, moisture barrier installer, and related trades whose work follows or affects moisture barrier.
 - 3. Review and discuss:

- a. Surface preparation, minimum substrate curing period, and installation procedures.
- b. Special details and flashings.
- c. Sequence of construction, responsibilities, and schedule for subsequent operations.
- d. Mock-up requirements.
- e. Inspection, protection, and repair procedures.

1.4 SUBMITTALS

- A. Submittals for Review:
 1. Product Data: Manufacturer's descriptive data.
 2. Samples: 12 x 12 inch moisture barrier samples.
- B. Sustainable Design Submittals:
 1. Regional Materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Sheet Moisture Barriers:
 1. DuPont. (www.tyvek.com)
 2. Griffolyn, Division of Reef Industries. (www.reefindustries.com)
 3. Raven Industries. (www.rufco.com)
- B. Acceptable Manufacturers - Rubberized Sheet Moisture Barriers:
 1. Grace Construction Products. (www.graceconstruction.com)
 2. W.R. Meadows, Inc. (www.wrmeadows.com)
 3. Polyguard Products, Inc. (www.polyguardproducts.com)
- C. Acceptable Manufacturers - Fluid Applied Moisture Barriers:
 1. Carlisle Coatings and Waterproofing. (www.carlisle-ccw.com)
 2. Henry Company. (www.henry.com)
 3. Tremco Incorporated. (www.tremcosealants.com)
- D. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Moisture Barrier: Asphalt impregnated felt, ASTM D226, No. 15 non perforated.

2.3 ACCESSORIES

- A. Fasteners: Hot-dip galvanized or fluoropolymer coated steel screws with 1 inch diameter plastic washers, minimum 5/8 inch penetration into framing.
- B. Joint Tape: Minimum 2 inches wide, pressure sensitive, waterproof, of type recommended by moisture barrier manufacturer.

- C. Flashing Sheet: Self adhering, rubberized asphalt laminated to HPDE facing, minimum 30 mil thick. Type recommended by moisture barrier manufacturer.
- D. Primer: Type recommended by moisture barrier manufacturer.
- E. Patching Compound: Type recommended by moisture barrier manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean surfaces to receive moisture barrier; remove loose and foreign matter that could impair adhesion or performance.
- B. Protect adjacent and underlying surfaces.
- C. Fill voids, holes, and cracks over 1/16] inch in width with patching compound; finish flush with adjacent surfaces. Apply one coat of moisture barrier over patched areas and allow to dry.
- D. Apply joint tape centered over sheathing joints. Lap ends 2 inches minimum. Press to full bond with substrate without voids, wrinkles, bridging, or fishmouths.

3.2 INSTALLATION - SHEET MOISTURE BARRIERS

- A. Provide complete and continuous barrier.
- B. Apply primer when required by moisture barrier manufacturer.
- C. Install moisture barrier without tears, voids, and holes.
- D. Begin application at low point; weatherlap succeeding courses minimum 4 inches.
- E. Lap ends 6 inches minimum. Tape seal lapped ends and edges.
- F. Fasten at maximum 12 inches on center.
- G. Press to full bond with substrate without voids, wrinkles, bridging, or fishmouths.
- H. Seal to door and window frames, around penetrations, and at perimeter.

3.3 APPLICATION - FLUID APPLIED MOISTURE BARRIERS

- A. Apply moisture barrier in accordance with manufacturer's instructions.
- B. Apply primer to joints in substrate, inside and outside corners, and around perimeter and penetrations. Apply joint tape over primer; press to full bond with substrate.
- C. Apply moisture barrier by [roller] [or] [spray] to continuous and uniform coverage with minimum mil thickness as recommended by manufacturer.
- D. Seal to door and window frames, around penetrations, and at perimeter with flashing sheet. Press to full bond with substrate without voids, wrinkles, bridging, or fishmouths.

3.4 FIELD QUALITY CONTROL

- A. Inspect moisture barrier for damage just prior to covering.
- B. Clean damaged areas and cover with additional moisture barrier material minimum 6 inches larger than damaged area on all sides. Seal to main moisture barrier with continuous tape.

END OF SECTION

[THIS PAGE LEFT INTENTIONALLY BLANK]

SECTION 07 42 13

ALUMINUM METAL PLATE WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum metal plate wall panels

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 – Cold-Formed Metal Framing: Wall panel substrates support framing.
- B. Section 06 1000 – Rough Carpentry: Plywood substrate wall sheathing.
- C. Section 07 2500 – Weather Barriers: Air and moisture barrier required as part of metal wall panel assembly.
- D. Section 07 6200 – Sheet Metal Flashing and Trim: Field formed flashings and other sheet metal work.
- E. Section 07 9200 – Joint Sealants: Perimeter sealant.

1.03 DEFINITION

- A. Metal Plate Wall Panel Assembly: Metal plate wall panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete weather tight wall system based on AAMA CW-RS-1.

1.04 REFERENCE STANDARDS

- A. AAMA - American Architectural Manufacturers Association (www.aamanet.org)

AAMA CW-RS-1 – The Rain Screen Principle and Pressure Equalized Wall Design; 2012

AAMA 501.1 – Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2005

AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2009

AAMA 508 – Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems; 2014 [Testing based on 2007 Edition]

AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014

AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013 [Testing based on 2005 Edition]

- B. ASTM International (American Society for Testing and Materials; www.astm.org)
 - 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011
 - 2. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015

3. ASTM D523 - Standard Test Method for Specular Gloss; 2014
 4. ASTM D2244 – Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2015
 5. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011
 6. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 07(2015)
 7. ASTM E8/E8M - Standard Test Methods for Tension Testing of Metallic Materials; 2013a
 8. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 04(2012)
 9. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014
 10. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 00(2009)
 11. ASTM E1233/E1233M – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential; 2014 [Testing based on 2006 Edition]
 - C. TAS - Testing Application Standards; Florida Building Code, 2010
 1. TAS 202 – Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading; 1994
 2. TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading; 1994
 - D. LEED – Leadership in Energy and Environmental Design
 - E. NAAMM – National Association of Architectural Metal Manufacturers
 - F. SMACNA – Sheet Metal and Air Conditioning Contractor’s National Association
 - G. PS - Voluntary Product Standard; National Institute of Standards and Technology (NIST)
 1. PS-1 – Structural Plywood; 2009
- 1.05 ADMINISTRATIVE REQUIREMENTS
- A. Coordination: Coordinate panel assemblies with rain drainage, flashing, trim, stud back-up, soffits, and other adjoining work.
 - B. Preinstallation Meeting:
 1. Attendees:
 - a. Owner.

- b. Architect.
 - c. Installer.
 - d. Panel manufacturer's representative.
 - e. Structural support installer's.
 - f. Installer's whose work interfaces with or affects wall panels including installers of doors, windows, and louvers.
2. Review and finalize construction schedule.
3. Verify availability of materials, installer's personnel, equipment, and facilities needed to maintain schedule.
4. Review means and methods related to installation, including manufacturer's written instructions.
5. Examine support conditions for compliance with requirements, including alignment and attachment to structural members.
6. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affects this Work.
7. Review temporary protection requirements for during and after installation of this Work.

1.06 SUBMITTALS

- A. See Section 01 3000 – Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for each type of product indicated, include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal plate wall panel and accessory.
- C. Shop Drawings: Submit fabrication and installation layouts of metal plate wall panels; including details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 1. Provide distinction between factory-assembled, shop-assembled, and field-assembled work.
 2. Provide details of following items at full scale.
 - a. Manufacturer's standard sheet metal trims.
 - b. Components of wall panel construction, anchorage methods, and hardware.
- D. Coordination Drawings: Submit exterior elevations, drawn to scale, that have the following items shown and coordinated with each other, using input from installers of the following items:
 1. Metal plate wall panels and attachments.
 2. Girts.

3. Wall-mounted items including doors, windows, louvers, and lighting fixtures.
 4. Penetrations of wall by pipes and utilities.
- E. Samples: Submit for each type of exposed finish required, and prepared on samples of size as follows:
1. Aluminum Metal Plate Wall Panels: At least 2 inch by 3 inch.
- F. Test and Inspection Reports: Submit test and inspection reports on each type of wall panel system provided for project based on evaluation of comprehensive tests performed by qualified testing agency.
- G. Maintenance Data: Submit maintenance data for metal plate wall panels.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with at least five years of documented experience.
- B. Installer: Company specializing in performing work of this section and approved by manufacturer.
1. Install system in strict compliance with manufacturer's installation instructions.
- C. Anodized Finish Applicator: Provide either caustic (traditional) or eco-friendly (acid) etching technologies.
1. Use fully automated, computer-controlled process lines for consistency of finish throughout project.
 2. Use documented production line quality control protocols in accordance with AAMA 611 test procedures.
- D. Source Limitations: Obtain each type of metal plate wall panel from single source and from single manufacturer.

1.08 MOCKUPS

- A. Mockups: Provide mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and to establish quality standards for fabrication and installation.
1. Build mockup of typical wall panel assembly, including corner, supports, attachments, and accessories.
 - a. Include at least four panels to represent a four-way panel joint and showing full thickness.
- B. Approval of mockups does not constitute approval of deviation from Contract Documents within mockups unless these deviations are approved by Architect in writing.

- C. Subject to compliance with requirements, approved mockups may become part of completed Work if undisturbed upon Date of Substantial Completion.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling: Store materials in clean, dry, interior area in accordance with manufacturer's instructions.
- C. Deliver panels, components, and other manufactured items without damage or deformation.
- D. Protect panels during transportation, handling, and installation from weather, excessive temperatures and construction operations.
- E. Handle panels in strict compliance with manufacturer's instructions and recommendations, and in a manner to prevent bending, warping, twisting, and surface damage.
 - 1. Store panels vertically with top of panel down, storage of panels horizontally is not permitted.
- F. Store panels covered with suitable weather tight and ventilated covering.
- G. Provide storage of panels to ensure dryness, with positive slope for drainage of moisture.
- H. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.
- I. Remove strippable protective covering from aluminum panel prior to installation.

1.10 SITE CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of this Work to be performed according to manufacturer's installation instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before panel fabrication and indicate measurements on Shop Drawings.
 - 1. Coordinate with construction schedule.

1.11 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Wall System Warranty: Provide wall panel manufacturer warranty, agreeing to correct defects in manufacturing of materials within a one year period after Date of Substantial Completion.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.

- b. Deterioration: Beyond normal weathering of wall system metals and other materials.
- C. Panel Material Warranty: Provide panel material manufacturer warranty, agreeing to repair finish of metal plate wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 1 years from Date of Substantial Completion.
 - 2. Warranty Coverage: In accordance with AAMA 2605 for 70 percent PVDF resin on aluminum finish requirements.
 - a. Fading, Loss of Color Retention: Loss of 5 Delta E units (Hunter) or less, in accordance with ASTM D2244.
 - b. Chalking, Chalky White Powder on Panel Surface: Chalking at No. 8 or less for colors, or No. 6 for white, in accordance with ASTM D4214.
 - c. Loss of Adhesion: Loss of 10 percent due to cracking, checking or peeling, or failure to adhere to bare metal.
 - d. Gloss Retention: 50 percent or less in accordance with ASTM D523.
 - e. Salt Spray, Accelerated: At least 4,000 hours in accordance with ASTM B117.
 - f. Humidity Testing, Accelerated: At least 4,000 hours in accordance with ASTM D2247.
 - 3. Warranty Coverage: In accordance with AAMA 611 Class 1 anodized aluminum finish requirements.
 - a. Loss of Adhesion: Resists cracking, crazing, flaking, and blistering when forming and welding completed prior to finishing; post forming or welding voids warranty.
 - b. Fading - Loss of Color Retention: Loss of 5 Delta E units (Hunter) or less, in accordance with ASTM D2244.
 - c. Chalking, Chalky White Powder on Panel Surface: Chalking at No. 8 or less in accordance with ASTM D4214.
 - d. Salt Spray, Accelerated: At least 3,000 hours in accordance with ASTM B117.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Dri-Design – Aluminum Wall Panel System.
Address: 12480 Superior Ct., Holland, Michigan 49424.
P.O. Box 1286 Holland, Michigan 49422-1286.
Phone: (616) 355-2970; Fax: (616) 355-2972;
Website: www.dri-design.com.
- B. Substitutions not permitted.

2.02 PERFORMANCE REQUIREMENTS

- A. Metal Plate Wall Panel Assemblies: Comply with performance requirements without failure due to defective manufacturing, fabrication, installation, or other construction defects.
- B. Design, fabricate, and erect a dry joint, pressure equalized rainscreen aluminum wall panel system without use of sealants, gaskets, or butyl tape, tested as installed in compliance with AAMA 508, and as follows:
 - 1. Cyclic Static Air Pressure Differential: Pass cycled pressure loading at 25 psf in 100 three-second cycles in accordance with ASTM E1233/E1233M.
 - 2. Air Infiltration: Pass when tested at 1.57 psf (25 mph) in accordance with ASTM E283.
 - 3. Water Penetration:
 - a. Static: Pass water penetration test under 25.0 psf positive static air pressure difference for at least 15 minutes with 5 gallons per sf per hour of water applied in accordance with ASTM E331.
 - b. Dynamic: Pass water penetration test under 15.0 psf dynamic pressure difference for at least 15 minutes with 5 gallons per sf per hour of water applied in accordance with AAMA 501.1.
 - 4. Structural: Provide systems tested in accordance with ASTM E330/E330M and certified to be without permanent deformation or failure of structural members.
- C. High Velocity Hurricane Zone (HVHZ): Comply with ASTM E8/E8M test methods and performance requirements of Florida Building Code and Miami-Dade County test protocols TAS-202 and TAS-203 for HVHZ with at least plus 61 psf to minus 80 psf design pressure rating.
 - 1. Application: For aluminum plate thickness of 0.080 inch only.

2.03 MATERIALS

- A. Aluminum Plate: Alloy and temper as recommended by manufacturer for application and in compliance with manufacturers design requirements.
 - 1. Aluminum Material: Tension-leveled, [fluoropolymer PVDF painted finish, 3003-H14 manganese alloy].
 - 2. Thickness: 0.080 inch.
 - 3. Weight: Less than 2 lbs per sf.
 - 4. Finish: Four-Coat Fluoropolymer
- B. Panel Depth: 1-1/4 inch, nominal.
- C. Panel Size: As indicated on Drawings.
- D. Panel Joints: As indicated on Drawings.

2.04 FABRICATION

- A. Fabricate and finish wall panels within manufacturer's facilities and fulfill indicated performance requirements demonstrated by laboratory testing.
 - 1. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide post-finishing of panels, paint aluminum wall panels only after completion of panel fabrication and ensure exposed edges are coated.
- C. Provide post anodizing of panels, anodize aluminum wall panels only after completion of panel fabrication and ensure exposed edges are anodic coated without crazing of surface at formed edges.

2.05 FINISHES

- A. Comply with NAAMM's - Metal Finishes Manual for Architectural and Metal Products, for recommendations of designating finishes.
- B. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride (PVDF) resin system.
 - 1. Two-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 2. Three-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 3. Two-Coat Mica Fluoropolymer: AAMA 2605, fluoropolymer finish with suspended mica flakes containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
 - 4. Four-Coat Fluoropolymer: AAMA 2605, fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat and clear coats. Prepare, pre-treat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' installation instructions.
- C. Field Touch-Up Materials: As recommended by coating manufacturer for field application.

2.06 ACCESSORIES

- A. Metal Plate Wall Panel Accessories: Provide components required for a complete metal plate wall panel assembly including trim, copings, fascia, mullions, sills, corner units, flashings, and similar items. Match material and finish of panels unless otherwise indicated.
- B. Provide integral drainage system and manufactures standard extrusions at termination of dissimilar materials.

- C. Flashing and Trim: Match material, finish, and color of adjacent wall panels.
 - 1. Thickness: At least 0.040 inch.
 - 2. Refer to Section 07 6200.
- D. Panel Fasteners: Designed to withstand design loads, with at least 7/16 inch diameter head and neoprene washer.
 - 1. Aluminum Wall Panel Material: Provide stainless steel fasteners, or coated fastener approved by panel manufacturer or project wall consultant.
- E. Sub-Girts: Galvanized, provide size and gage in accordance with project requirements.
 - 1. Furring Channel: Provide Hat, C, U or Z type as recommended by manufacturer.
 - 2. Flat Strap: At least 14 gage, 0.0747 inch (1.90 mm) thick.
 - 3. Refer to Section 05 40 00.
- F. Substrate Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I, at least 5/8 inch thick.
 - 1. Refer to Drawings and Section 06 1000 for requirements.
- G. Weather Barriers: Provide climate specific weather barrier with performance characteristics for air penetration, water vapor transmission, and water penetration resistance.
 - 1. Refer to Section 07 2500 for requirements.
- H. Sealants: As recommended by metal panel manufacturer for openings within wall panels and perimeter conditions.
 - 1. Refer to Section 07 92 00 for requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, and Work areas and conditions with Installer present for compliance with requirements for installation tolerances, wall panel supports, and other conditions affecting performance of this Work.
- B. Examine wall framing to verify that girts, angles, channels, studs, and other structural wall panel support members and anchorage have been installed within alignment tolerances required by wall panel manufacturer.
- C. Verify that weather barrier has been installed over sheathing or substrate to prevent air infiltration or water penetration.
- D. Examine rough-in for components and systems penetrating wall panels to coordinate actual penetration locations relative to wall panel joint locations prior to installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Miscellaneous Framing: Install sub girt, base angles, sills, furring, and other wall panel support members and provide anchorage in accordance with ASTM C754 for gypsum panel type substrates and panel manufacturer's installation instructions.

3.03 INSTALLATION

- A. Install wall panels in accordance with manufacturer's installation instructions, including pressure equalized rainscreen installation method and installation guidelines.
 - 1. Wall panels consist of single sheets of metal formed with interlocking gutter and drainage system integral to the panel with single horizontal attachment for dry-joint rainscreen assembly.
 - 2. Use of secondary drainage channels, brackets, support pins, joint sealants or gaskets to manage the drainage of wall panel system is not permitted.
 - 3. Attach wall panels using progressive interlocking method, engaging bottom of panel in top of previous panel working bottom up, and left to right.
 - 4. Install wall panels with single top attachment in pre-punched holes to allow individual panels to move due to thermal expansion.
 - 5. Do not compromise internal gutter.
- B. Install wall panels for orientation, sizes, and locations as indicated on Drawings.
- C. Install wall panels with proper anchorage and other components for this Work securely in place.
- D. Install wall panels with provisions for thermal and structural movement.
- E. Install shims to plumb substrates as necessary for installation of wall panels.
- F. Install weather tight seals at perimeter of wall panel openings.
 - 1. Test for proper adhesion on small unexposed area of solid surfacing prior to use.
 - 2. Refer to Section 07 92 00.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA - Architectural Sheet Metal Manual.
 - 1. Provide concealed fasteners where possible, and set units true to line and level as indicated.
 - 2. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 3. Install flashing and trim as wall panel Work proceeds.
- H. Install weather tight escutcheons for pipe and conduit penetrating exterior walls.
- I. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by wall panel manufacturer.

- J. Install attachment system to support wall panels and with provisions to provide a complete weather tight wall system, including sub girts, extrusions, flashings and trim.
 - 1. Include attachment to supports and trims at locations using dissimilar materials.
 - 2. Do not apply sealants to joints, unless noted otherwise on Drawings or Shop Drawings.
 - 3. Install starter extrusion at base course and at cut panel locations.
 - K. Install accessories with positive anchorage to building and weather tight mounting and provisions for thermal expansion, and coordinate installation with flashings and other components.
 - 1. Install components required for a complete wall panel assembly including trim, copings, flashings and other accessory items.
 - L. Weather Barrier: Install weather barrier behind wall panels and over substrate in accordance with requirements of Section 07 2500.
- 3.04 TOLERANCES
- A. Shim and align wall panel units with installed tolerances of 1/4 inch in 20 feet, non-cumulative, on level, plumb, and location lines as indicated.
- 3.05 FIELD QUALITY CONTROL
- A. Testing Agency: Not required.
 - B. Water-Spray Test: Not required.
 - C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
 - D. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
 - E. Perform additional tests and inspections, at Contractor's expense, to verify compliance of replaced wall panels or necessary additional work with specified requirements.
 - F. Prepare test and inspection reports.
- 3.06 CLEANING
- A. Upon completion of wall panel installation, clean finished surfaces as recommended by panel manufacturer.
 - B. Upon completion of wall panel installation, clear weep holes and drainage channels of obstructions and dirt.
- 3.07 PROTECTION
- A. Protect installed products from damage during subsequent construction.
 - B. Replace wall panels damaged or deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal flashings and trim.
 - 2. Edge flashings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 2. 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
- B. American National Standards Institute/Single Ply Roofing Institute (ANSI/SPRI) ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- C. ASTM International (ASTM):
 - 1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - 2. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 3. A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
 - 4. A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 5. B32 - Standard Specification for Solder Metal.
 - 6. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 7. Sheet Metal and Air Conditioning Manufacturer's Association International (SMACNA) - Architectural Sheet Metal Manual.

1.3 SUBMITTALS

- A. Submittals for Review:

1. Shop Drawings: Show locations, types and thicknesses of metal, profiles, dimensions, fastening methods, provisions for expansion and contraction, and joint details.
2. Samples:
 - a. 3 x 3 inch prefinished metal samples showing available colors.

1.4 QUALITY ASSURANCE

- A. Fabricator and Installer Qualifications: Minimum 5 years experience in work of this Section.
- B. Design, fabricate, and install metal copings and edge flashings in accordance with ANSI/SPRI ES-1.
- C. Conform to SMACNA Manual for nominal sizing of gutters, scuppers, collector boxes and downspouts for rainfall intensity determined by a storm occurrence of 1 in 50 years.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Galvanized Steel Sheet:
 1. ASTM A653/A653M, Structural Quality, G60 galvanized coating class, 24 gage core steel unless noted otherwise.
 2. Where sheet metal is to be painted, apply phosphate film at factory.
- B. Precoated Galvanized Steel Sheet:
 1. ASTM A755/A755M, Structural Quality, G60 galvanized coating class, 24 gage core steel unless noted otherwise.
 2. Finish: AAMA 621, fluoropolymer coating, containing minimum 50 percent PVDF resins, color to be selected from manufacturer's full color range.
- C. Aluminum Sheet:
 1. ASTM B209, alloy 3003, temper H14, 0.032inch thick.
 2. Finish: AAMA 611; Architectural Class II anodized, clear.
 3. Finish: AAMA 2605, fluoropolymer coating containing minimum 50 percent PVDF resins, three coat system, color to be selected from manufacturer's full color range.

2.2 ACCESSORIES

- A. Solder: ASTM B32.
- B. Fasteners: Same material and finish as sheet metal, with neoprene gasketed washers where exposed.
- C. Joint Sealers: Specified in Section 079200.

2.3 FABRICATION

- A. Fabricate components in accordance with SMACNA Manual.
- B. Profiles:
 1. Gutters: N/A

2. Downspouts: N/A
- C. Solder shop formed joints. After soldering, remove flux and wash clean.
- D. Fabricate corners in single units with minimum 18 inch long legs.
- E. Fabricate vertical faces with bottom edge formed outward $\frac{1}{4}$ inch and hemmed to form drip.
- F. Form sections accurate to size and shape, square and free from distortion and defects.
- G. Provide for thermal expansion and contraction in sheet metal:
 1. Gutters:
 - a. Place expansion joints at maximum 50 feet on center.
 - b. Locate expansion joints between downspouts; prevent water flow over joint.
 2. Other sheet metal:
 - a. Provide expansion joints in sheet metal exceeding 15 feet in running length.
 - b. Place expansion joints at 10 feet on center maximum and maximum 2 feet from corners and intersections.
 3. Joint width: Consistent with types and sizes of materials, minimum width $\frac{1}{4}$ inch.
- H. Fabricate expansion joints in metal copings and edge flashings with backing and cover plates formed to flashing profile, minimum 8 inches long.
- I. Unless otherwise indicated, provide minimum $\frac{3}{4}$ inch wide flat lock seams; lap in direction of water flow.
- J. Fabricate cleats and starter strips of same material as sheet metal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install flashing and sheet metal as indicated and in accordance with SMACNA Manual.
- B. Install cleats and starter strips before starting installation of sheet metal. Fasten at 6 inches on center maximum.
- C. Expansion Joints in Metal Copings:
 1. Center backing plate between flashing pieces at end joints.
 2. Apply two continuous beads of joint sealer between backing plate and flashing sections at each end.
 3. Install flashing pieces with $\frac{1}{2}$ inch expansion space at abutting ends; apply sealer to expansion space.
 4. Apply two continuous beads of joint sealer between cover plate and flashing sections at each end.
- D. Secure flashings with concealed fasteners where possible.
- E. Apply plastic cement between metal and bituminous flashings.
- F. Fit flashings tight, with square corners and surfaces true and straight.

- G. Seam and seal field joints.
 - H. Separate dissimilar metals with bituminous coating or non-absorptive gaskets.
 - I. Reglets:
 - 1. Install reglets true to line and level. Seal top of surface mounted reglet with joint sealer.
 - 2. Install flashings into reglets to form tight fit. Secure with lead or plastic wedges at 9 inches on center maximum. Seal remaining space with joint sealer.
 - J. Gutters:
 - 1. Secure with straps spaced maximum 36 inches on center and within 12 inches of ends.
 - K. Downspouts:
 - 1. Secure with straps spaced maximum 8 feet on center and within 2 feet of ends and elbows.
 - 2. Flash downspouts into gutters and fasten.
 - 3. Flash upper sections into lower sections minimum 2 inches at joints; fasten sections together.
 - L. Apply joint sealers as specified in Section 079200.
- 3.2 CLEANING
- A. Clean sheet metal; remove slag, flux, stains, spots, and minor abrasions without etching surfaces.

END OF SECTION

SECTION 07 92 00

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Joint backup materials.
2. Joint sealers.

B. Related Sections:

1. Division 01: General Requirements; Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. ASTM International (ASTM):

1. C510 - Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
2. C719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
3. C794 - Standard Test Method for Adhesion In Peel of Elastomeric Joint Sealants.
4. C834 - Standard Specification for Latex Sealing Compounds.
5. C919 - Standard Practice for Use of Sealants in Acoustical Applications.
6. C920 - Standard Specification for Elastomeric Joint Sealants.
7. C1193 - Standard Guide for Use of Joint Sealants.
8. C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.
9. C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
10. C1472 - Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width.
11. C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.
12. D2203 - Standard Test Method for Staining from Sealants.
13. D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

1.3 SUBMITTALS

A. Submittals for Review:

1. Product Data: Indicate sealers, primers, backup materials, bond breakers, and accessories proposed for use.
2. Warranty: Sample warranty form.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 2 years experience in work of this Section.
- B. Maximum Volatile Organic Compound (VOC) Content; interior sealers and accessories:
 1. Sealers: 250 grams per liter.
 2. Primers for non-porous substrates: 250 grams per liter.
 3. Primers for porous substrates: 775 grams per liter.
- C. Field Pre-Construction Testing:
 1. Perform field testing for sealant adhesion in accordance with ASTM C1521 on exterior mockup, prior to beginning application, and for each 1000 feet of installed sealer.
 2. Install sealers using joint preparation methods and materials recommended by sealer manufacturer.
 3. When tests indicate sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of sealers under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F (5 deg C).
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTIES

- A. Furnish manufacturer's and applicator's standard warranties providing coverage for sealers and accessories that fail to provide air and water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. BASF Building Systems. (www.buildingsystems.basf.com)
 2. Dow Corning Corp. (www.dowcorning.com)
 3. GE Silicones. (www.siliconeforbuilding.com)

4. Pecora Corp. (www.pecora.com)
5. Sika Corp. (www.sikausa.com)
6. Tremco, Inc. (www.tremcosealants.com)

B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Joint Sealer Type 1: Urethane joint sealant.

1. ASTM C920, Grade NS, single component polyurethane type, non sag.
2. Movement capability: Plus or minus 25percent.
3. Color: To be selected from manufacturer's full color range.

B. Joint Sealer Type 2: Silicone joint sealant.

1. ASTM C920, Grade NS, single component silicone type, non-staining, field tintable, non sag.
2. Movement capability: Plus or minus 50 percent.
3. Color: To be selected from manufacturer's full color range.

C. Joint Sealer Type 3: Latex joint sealants

1. ASTM C834, single component acrylic latex or siliconized acrylic latex, non sag, Type OP, Grade NF.
2. Movement capability: Plus or minus 7-1/2 percent.
3. Color: To be selected from manufacturer's full color range.

D. Joint Sealer Type 4: Acoustical joint sealant.

1. ASTM C834, single component acrylic latex, non sag, non-hardening, non-corrosive, recommended by manufacturer for acoustical applications.
2. Movement capability: Plus or minus 7-1/2percent.
3. Color: To be selected from manufacturer's full color range.

2.3 ACCESSORIES

A. Primer:

1. Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces:

1. 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:

1. Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Joint Backing:
 1. ASTM C1330, closed cell polyethylene foam, preformed round joint filler, non-absorbing, non-staining, resilient, compatible with sealer and primer, recommended by sealer manufacturer for each sealer type.
 2. Size: Minimum 1.25 times joint width.

2.4 MIXES

- A. Mix multiple component sealers in accordance with manufacturer's instructions.
 1. Mix with mechanical mixer; prevent air entrainment and overheating.
 2. Continue mixing until color is uniform.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove loose and foreign matter that could impair adhesion. If surface has been subject to chemical contamination, contact sealer manufacturer for recommendation.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Protect adjacent surfaces with masking tape or protective coverings.
- D. Calculate joint dimensions in accordance with ASTM C1472.

3.2 APPLICATION

- 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:
 1. Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
 2. Install acoustical sealers and accessories in accordance with ASTM C919.
- C. Install sealant backings of kind 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.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that 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.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs 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. Retain one or more of three subparagraphs below to suit joint configurations required for Project. First subparagraph makes concave configuration the default requirement; second and third subparagraphs require that other configurations be indicated on Drawings. Revise if one of the latter two configurations is the default requirement.
 4. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 5. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
 6. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.3 FIELD QUALITY CONTROL

- A. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 CLEANING

- A. Clean off excess sealant 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.

3.5 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 deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

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:

- 1. Standard and custom hollow metal doors and frames.
- 2. Steel sidelight, borrowed lite and transom frames.
- 3. Louvers installed in hollow metal doors.
- 4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

- 1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
- 2. Division 08 Section "Flush Wood Doors".
- 3. Division 08 Section "Door Hardware".
- 4. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
- 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- 5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- 6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- 7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 - 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 - 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

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

1.7 COORDINATION

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

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
 - 1. CECO Door Products (C).
 - 2. Curries Company (CU).
 - 3. Steelcraft (S).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Manufacturers Basis of Design:
 - a. Curries Company (CU) - M Series.
- C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.5 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - i. Two anchors per jamb up to 60 inches high.
 - ii. Three anchors per jamb from 60 to 90 inches high.
 - iii. Four anchors per jamb from 90 to 120 inches high.
 - iv. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - i. Three anchors per jamb up to 60 inches high.
 - ii. Four anchors per jamb from 60 to 90 inches high.
 - iii. Five anchors per jamb from 90 to 96 inches high.

- iv. Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - v. Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
- 10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping 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 non-template, 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 Sections.

2.7 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

Part 1 General

1.1 Related Documents

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

1.2 Summary

- A. Section Includes: Kawneer Architectural Aluminum Storefront System, including perimeter trims, stools, accessories, shims, and anchors, and perimeter sealing of storefront units.

- 1. Types of Kawneer Aluminum Storefront Systems include:

- a. Trifab™ VG 451 Framing System – 2" x 4 ½" nominal dimension: Non-Thermal; Center; Screw Spine Fabrication.
- b. Trifab™ VG 451 Framing System – Impact Glazing and Blast Mitigation.
- c. Trifab™ VG 451T Framing System – 2" x 4 ½" nominal dimension; Thermal; Front; Weatherseal Glazed (Type B); Screw Spine Fabrication.
- d. Trifab™ VG 451T Framing – Impact Glazing and Blast Mitigation.

- B. Related Sections:

- 1. 07 92 00 – Joint Sealers
- 2. 08 41 13 – Aluminum Framed Entrance and Storefronts
- 3. 08 71 00 – Door Hardware
- 4. 08 80 00 – Glazing

1.3 Definitions

- A. Definitions: For fenestration industry standard terminology and definitions refer to Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG)

1.4 Performance Requirements

- A. Storefront System Performance Requirements:

- 1. Wind loads: Provide storefront systems; include anchorage, capable of withstanding wind load design pressure of 16 lbs./sq. ft. inward and 16 lbs./sq. ft. outward. The design pressures are based on the 2015 Michigan Building Code.
- 2. Air Leakage: The test specimen shall be tested in accordance with ASTM E 283. Air Leakage rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.2 psf with interior seal, or, rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 1.6 psf without interior seal. CSA A440 Fixed Rating.

3. Water Resistance: The test specification shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf as defined in AAMA 501.
4. Uniform Load: A static air design load of 35 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess on $L/175$ of the span of any framing member. At a 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.
5. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures:
 - a. Temperature Change (Range): 0 deg. F; 180 deg. F.
 - b. Test Interior Ambient-Air Temperature: 75 deg. F.
 - c. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5 for a minimum of 3 cycles.
6. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be less than:
 - a. Glass to Exterior – 0.47 (low-e) or 0.61 (clear)
 - b. Glass to Center – 0.44 (low-e) or 0.61 (clear)
 - c. Glass to interior – 0.41 (low-e) or 0.56 (clear)
7. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
 - a. Glass to Exterior – 70frame and 69glass (low-e) or 69frame and 58glass (clear).
 - b. Glass to Center – 62frame and 68glass (low-e) or 63frame and 56glass (clear).
 - c. Glass to Interior – 56frame and 67glass (low-e) or 54frame and 58glass (clear).
8. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
 - a. Glass to Exterior – 38 (STC) and 31 (OITC).
 - b. Glass to Center – 37 (STC) and 30 (OITC).
 - c. Glass to Interior – 38 (STC) and 30 (OITC).
9. Windborne-Debris-Impact Resistance Performance: Shall be tested in accordance with ASTM E 1886, information in ASTM E 1996 and TAS 201/203.
 - a. Large-Missile Impact: For aluminum-framed systems located within 30 feet (9.1 m) of grade.

- b. Small-Missile Impact: For aluminum-framed systems located above 30 feet (9.1 m) of grade.
10. Blast Mitigation Performance: Shall be tested or proven through analysis to meet ASTM F1642, GSA-TS01, and UFC 04-010.01 performance criteria.

To meet UFC 04-010.01, B-3.1 Standard 10 for Windows and Skylights, the following options are available:

- a. Section B-3.1.1 Dynamic analysis.
- b. Section B-3.1.2 Testing.
- c. Section B-3.1.3 ASTM F2248 Design Approach.

1.5 Submittals

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Glazing.
 - 5. Flashing and drainage.
- G. Other Action Submittals:
 - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.6 Quality Assurance:

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum-framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements". Do not modify size and dimensional requirements.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications 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 mockup for type(s) of storefront 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".
- G. Structural-Sealant Glazing: Comply with ASTM C 1401, "Guide for Structural Sealant Glazing" for design and installation of structural-sealant-glazed systems.
- H. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1.7 Project Conditions

- A. Field Measurements: Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field 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. Trifab™ VG 451 (Non-Thermal) or Trifab™ 451T (Thermal) Framing System
 3. Trifab™ VG 451 (Non-Thermal) or Trifab™ 451T (Thermal) Framing System (Impact Glazing and Blast Mitigation)
 4. System Dimensions: 2" x 4-1/2" (50.8 mm x 114.3 mm)
 5. Glass: Exterior
- B. N/A
- C. Substitutions: Refer to Substitutions Section for procedures and submission requirements
1. Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
 2. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid storefront installation and construction delays.
 3. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
 4. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefronts for a period of not less than ten (10) years. (Company Name)
 5. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
 6. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.
- D. 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.

2.2 Materials

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum framing members, trim hardware, anchors, and other components.
- C. 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.

- D. 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.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 Storefront Framing System

- A. Thermal Barrier (Trifab™ VG 451T):
 - 1. Kawneer IsoLock™ Thermal Break with a 1/4" (6.4 mm) separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposes shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

2.4 Glazing Systems

- A. Glazing: As specified in Division 08 Section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- 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: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:

1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
 - a. Color: Black
2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
 - a. Color: Matching structural sealant.

2.5 Entrance Door Systems

- A. Entrance Doors: As specified in Division 084113 Section "Aluminum-Framed Entrances and Storefronts".
- B. Entrance Door Hardware: As specified in Division 084113 Section "Door Hardware".

2.6 Accessory Materials

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants".
- D. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.7 Fabrication

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 1. Profiles that are sharp, straight, and free of defects or deformations.
 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 4. Physical and thermal isolation of glazing from framing members.
 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 6. Provisions for field replacement of glazing.
 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. Structural-Sealant-Glazed Framing Members: N/A.

- D. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
- E. 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 _____).
 - 2. Kawneer Permanodic™ AA-M10C21A41 / AA-M45C22A41, AAMA 611, Architectural Class I Clear Anodic Coating (Color #14 Clear) (Optional).
 - 3. Kawneer Permanodic™ AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear) (Standard).
 - 4. Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating (Color _____).
 - 5. Kawneer Permادize™ (50% PVDF), AAMA 2604, Fluoropolymer Coating (Color _____).
 - 6. Kawneer Permacoat™ AAMA 2604, Powder Coating (Color _____)
 - 7. Other: Manufacturer _____ Type _____ Color _____.

PART 3 EXECUTION

3.1 Examination

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight framed aluminum storefront system installation.
 - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
 - 2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
 - 3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components.
- B. Install aluminum-framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum-framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed storefront to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 Field Quality Control

- A. Field Tests: Architect shall select storefront 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 by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.
 - 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/ft², whichever 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 6.2 psf (300 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 Adjusting, Cleaning, and Protection

- A. Clean aluminum surfaces immediately after installing aluminum-framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 08 71 00

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 commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
 - 3. Door hardware includes, but is not necessarily limited to, the following:
 - a. Mechanical door hardware.
 - b. Electromechanical door hardware.
 - c. Cylinders specified for doors in other sections.
- B. Related Sections:
 - 1. Section 08 11 13 – Hollow Metal Doors and Frames
 - 2. Section 08 14 16 – Flush Wood Doors
- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- D. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions 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. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 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.
 - h. Warranty information for each product.
 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: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified 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.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware)

for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.

2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 3. Review sequence of operation narratives for each unique access controlled opening.
 4. Review and finalize construction schedule and verify availability of materials.
 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

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. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- 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, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories 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 standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. 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. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- A. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- B. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for standard duty cylindrical (bored) locks and latches.
 - 3. Five years for exit hardware.
 - 4. Twenty five years for manual surface door closer bodies.
 - 5. Five years for motorized electric latch retraction exit devices.
 - 6. Two years for electromechanical door hardware.

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.

PART 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets 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.

- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. 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.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following:
 - a. 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 all out-swinging lockable doors.
 - 5. Acceptable Manufacturers:
 - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
 - 1. Acceptable Manufacturers:
 - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).

- b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2. POWER TRANSFER DEVICES

- a. NOT USED

2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

- 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
- 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
- 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
- 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
- 5. Acceptable Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 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.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Manufacturer's Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 3. New System: Key locks to a new key system as directed by the Owner.
- E. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
- F. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.
- G. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Acceptable Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).
- H. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – ML2000 Series.
 - b. Sargent Manufacturing (SA) – 8200 Series.
 - c. Yale Locks and Hardware (YA) – 8800FL Series.
- B. Cylindrical Locksets, Grade 2 (Standard Duty): ANSI/BHMA A156.2, Series 4000, Grade 2 certified.
1. Locks are to be non-handed and fully field reversible.
 2. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - CL3800 Series.
 - b. Sargent Manufacturing (SA) - 7-Line.
 - c. Yale Locks and Hardware (YA) - 5300LN Series.

2.6 STAND ALONE ACCESS CONTROL LOCKING DEVICES

A. NOT USED

2.7 LOCK AND LATCH STRIKES

- A. 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. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
 4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.8 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
 5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when

conventional power supplies are not sufficient to provide the proper inrush current.

6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
 7. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
 - a. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
 8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
 9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 10. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 11. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
- C. Tube Steel Removable Mullions: ANSI/BHMA A156.3 removable steel mullions with malleable-iron top and bottom retainers and a primed paint finish.
1. Provide keyed removable feature where specified in the Hardware Sets.
 2. Provide stabilizers and mounting brackets as required.
 3. Provide electrical quick connection wiring options as specified in the hardware sets.
 4. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - 700/900 Series.
 - b. Sargent Manufacturing (SA) - 980S Series.

2.9 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC8000 Series.
 - b. Norton Door Controls (NO) – 9500 Series.
 - c. Sargent Manufacturing (SA) - 281 Series.

2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Acceptable Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.11 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Acceptable Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 - 1. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.13 ELECTRONIC ACCESSORIES

- A. NOT USED

2.14 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. 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. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in 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. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and 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.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating 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.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. Manufacturer's Abbreviations:

- 1. MK - McKinney
- 2. PE - Pemko
- 3. RU - Corbin Russwin
- 4. YA - Yale
- 5. RO - Rockwood
- 6. GS - ASSA ABLOY Glass Solutions
- 7. RF - Rixson
- 8. SU - Securitron

Hardware Sets**Set: 1.0**

Doors: 101, 112

- | | | | |
|---|------------------|------------------|----|
| 1 | Continuous Hinge | CFM-SLF-HD1 x PT | PE |
|---|------------------|------------------|----|

1	Exit Device (rim, nightlatch)	ED4200 K157 x LC M110 M92 MELR M52	630	RU ⚡
1	Mortise Cylinder	2153	626	YA
1	Rim Cylinder	1193	626	YA
1	Pull	RM201 Mtg-Type 12XHD	US32D- 316	RO
1	Conc Overhead Stop	6-X36	630	RF
1	Surface Closer	DC8220 x mounting plate to suit application	689	RU
1	Threshold	1715AK MSES25SS		PE
1	Weatherstrip	- integral within construction of door and frame assembly		00
1	Sweep	29326CNB TKSP8		PE

Notes:

Door normally closed and locked. Key override outside retracts latch bolt of exit device.
Free egress always permitted.

Set: 2.0

Doors: 102

1	Continuous Hinge	CFM-SLF-HD1		PE
1	Push Pull	RM251 Mtg-Type 12XHD Mtg-Type 11XHD	US32D- 316	RO
1	Conc Overhead Stop	6-X36	630	RF
1	Surface Closer	DC8220 x mounting plate to suit application	689	RU

Set: 3.0

Doors: 104

	Hinge (heavy weight)	T4A3786	US26D	MK
3	Hinge	TA2714	US26D	MK
1	Bathroom Lock	MOCN 8862FL IND	626	YA
1	Surface Closer	DC8200 - Pull Side Mount	689	RU
1	Kick Plate	K1050 10" high x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	406	US32D	RO
3	Silencer	608 / 609		RO
1	Coat Hook	796	US26D	RO

Notes:

Latch bolt operated by lever either side, except when outside lever is locked by thumb turn inside.

Operating inside lever or closing door unlocks outside lever. Key outside retracts latch at all times, even if thumb turn is held in locked position.

Install coat hook at 48" centerline above floor.

Set: 4.0

Doors: 108, 109, 110

3	Hinge	TA2714	US26D	MK
1	Access Control Cyl Lock	MO NTB620-NR	626	YA ⚡
1	Wall Stop	406	US32D	RO
3	Silencer	608 / 609		RO

Notes:

Latch operated by lever either side, unless outside lever is locked or unlocked by key outside or thumb turn

inside. Outside lever is unlocked by key outside / combination, or thumb turn inside. Latch is retracted by key outside when outside lever is locked. Inside lever always free.

Set: 5.0

Doors: 111

3	Hinge	TA2714	US26D	MK
1	Cylindrical Lock	MO 5305LN	626	YA
1	Surface Closer	DC8210 A12	689	RU
1	Kick Plate	K1050 10" high x 2" LDW 4BE CSK	US32D	RO
3	Silencer	608 / 609		RO

Notes:

Latch bolt operated by key outside or lever inside. Outside lever always rigid. Inside lever always free for egress.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 GENERAL1.1 SUMMARY

- A. Section Includes:
 - 1. Glass for other sections referencing this Section.
 - 2. Framed mirrors.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA) 800 - Voluntary Specifications and Test Methods for Sealants.
- B. American National Standards Institute (ANSI) Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
- C. American Society of Civil Engineers (ASCE) 7 - Minimum Design Loads for Buildings and Other Structures.
- D. ASTM International (ASTM):
 - 1. C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
 - 2. C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants.
 - 3. C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 - 4. C920 - Standard Specification for Elastomeric Joint Sealants.
 - 5. C1036 - Standard Specification for Flat Glass.
 - 6. C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT, Coated and Uncoated Glass.
 - 7. C1281 - Standard Specification for Preformed Tape Sealants for Glazing Applications.
 - 8. C1294 - Standard Test Method for Compatibility of Insulating Glass Edge Sealants with Liquid-Applied Glazing Materials.
 - 9. C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 - 10. E119 - Standard Test Method for Fire Tests of Building Construction and Materials.
 - 11. E152 - Standard Test Method for Fire Test of Door Assemblies.
 - 12. E163 - Standard Test Method for Fire Tests of Window Assemblies.
 - 13. E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
 - 14. E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
 - 15. E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- E. Consumer Product Safety Commission (CPSC) 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- F. Glass Association of North America (GANA):
 - 1. Engineering Standards Manual.
 - 2. Glazing Manual.
- G. Insulating Glass Manufacturers Alliance (IGMA):
 - 1. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units.
- H. Underwriters Laboratories (UL) 752 - Standard for Safety Bullet-Resisting Equipment.

1.3 SYSTEM DESCRIPTION

- A. Glass Thicknesses:
 - 1. Indicated thicknesses are minimums; select actual thicknesses by analyzing loads and conditions.
 - 2. Size glass to withstand positive and negative wind pressure acting normal to plane in accordance with Building Code as measured in accordance with ASTM E330.
 - 3. Provide glass in thicknesses and strengths to meet or exceed following criteria:
 - a. Comply with ASTM E1300.
 - b. Probability of breakage for vertical glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for load duration of 3 seconds.
- B. Thermal and Optical Performance Properties: Provide glass meeting specified performance properties, based on manufacturer's published test data for units of thickness indicated:
 - 1. U-factor: Per NFRC 100 expressed as Btu/square foot x hour x degree F.
 - 2. Solar heat gain coefficient: Per NFRC 200.
 - 3. Solar optical properties: Per NFRC 300.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Descriptive data and performance attributes for insulated glass.
 - 2. Warranty: Sample warranty form.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years experience in work of this Section.
- B. Regulatory Requirements:
 - 1. Provide safety glass for locations subject to human impact as required by Building Code.
 - 2. Safety glass: Tested and labeled to CPSC 16 CFR 1201.
- C. Perform Work in accordance with GANA Glazing Manual and IGMA TB-3001
- D. Interior Glazing Sealers and Accessories: Maximum volatile organic compound (VOC) content as follows:
 - 1. Glazing sealant: 250 grams per liter.
 - 2. Primers for non-porous substrates: 250 grams per liter.
 - 3. Primers for porous substrates: 775 grams per liter.

1.6 PROJECT CONDITIONS

- A. Perform glazing when ambient temperature is above 40 degrees F.
- B. Perform glazing on dry surfaces.

1.7 WARRANTIES

- A. Insulating Glass Units: Provide manufacturer's 10 year warranty against material obstruction of vision through unit due to:
 - 1. Intrusion of dust or moisture.
 - 2. Internal condensation.
 - 3. Film formation on internal glass surfaces caused by failure of hermetic seal except failure caused in whole or in part by breakage or fracturing of any portion of glass surface.
- B. Glass Coatings: Provide manufacturer's 10 year warranty against peeling, cracking, or deterioration of coating under normal conditions.
- C. Mirrors: Provide manufacturer's 10 year warranty against silver spoilage resulting from manufacturing defects.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Acceptable Manufacturers - Glass:
 - 1. Guardian Industries Corp. (www.guardian.com)
 - 2. Oldcastle Building Envelope. (www.oldcastlebe.com)
 - 3. Pilkington Architectural. (www.pilkington.com)
 - 4. PPG Industries, Inc. (www.ppg.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS - GLASS

- A. Clear Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
- B. Clear Tempered Glass: ASTM C1048, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select, Kind FT fully tempered.
- C. Mirror Glass: ASTM C1036, Type I transparent flat, Class 1 clear, Quality q2 mirror.

2.3 ACCESSORIES

- A. Setting Blocks: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone; 80 to 90 Shore A durometer hardness.
- B. Spacers: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone; 50 to 60 Shore A durometer hardness.
- C. Glazing Gaskets:
 - 1. Dense compression gaskets: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone or thermoplastic polyolefin rubber, molded or extruded shape to fit glazing channel retaining slot; black color.
 - 2. Soft compression gaskets: ASTM C509, Type II, black, molded or extruded, neoprene, EPDM, silicone or thermoplastic polyolefin rubber, of profile and hardness required to maintain watertight seal; black color.
- D. Glazing Sealant: ASTM C920, Type S, Grade NS, Class 25; single component silicone, low modulus, non sag, color to be selected from manufacturer's full color range.
- E. Sealant Backing: ASTM C1330, Type O, size and density to control glazing sealant depth and produce optimum glazing sealant performance.
- F. Primer: As recommended by glazing sealant manufacturer.
- G. Glazing Tape: ASTM C1281 and AAMA 800; butyl based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for installation.
- H. Mirror Adhesive: Adhesive setting compound, produced specifically for setting mirrors by spot application method.
- I. Mirror Frame: Roll formed stainless steel channel, No. 4 satin finish, 1/2 x 1/2 inch, 18 gage, mitered corners.

2.1 FABRICATION

- A. Annealed Glass: Comply with ASTM C1036.
- B. Tempered Glass:
 - 1. Comply with ASTM C1048.
 - 2. Process in horizontal position so that inherent roller distortion will run parallel to building floor lines after installation.

- C. Sealed Insulating Glass:
 - 1. Comply with ASTM E2190.
 - 2. Fabricate spacer bar frame of tubular aluminum filled with desiccant.
 - 3. Bond spacer bar frame to glass panes with twin primary seals.
 - 4. Fill space outside frame to glass edge with elastomeric sealant.
- D. Low-E Coated Glass: Apply low-emissivity coating to scheduled glass surface.
- E. Mirror Glass:
 - 1. Apply one coat of silver, one coat of electroplated copper, and one coat of organic mirror backing compound to back surface of glass.
 - 2. Isolate glass from frame with resilient, waterproof padding.
- D. Fabrication Tolerances: ASTM C1036 and ASTM C1048.
- E. Glass Identification:
 - 1. Apply manufacturer's label indicating type and thickness to each light of glass. Show position of exterior face when installed, where applicable.
 - 2. Etch manufacturer's label on each light of tempered glass.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean glazing rabbets; remove loose and foreign matter.
- B. Remove protective coatings on metal surfaces.
- C. Clean glass just prior to installation.

3.2 INSTALLATION - GENERAL

- A. Install glass in accordance with glass manufacturer's instructions.
- B. Maintain manufacturer's recommended edge and face clearances between glass and frame members.

3.3 INSTALLATION - SEALANT GLAZING METHOD

- A. Apply sealant to full depth of permanent stops.
- B. Press glass into sealant with slight lateral movement to ensure adhesion.
- C. Apply sealant to full depth of removable stops. Secure stops in position, forcing contact with sealant bead and completely filling joint.

3.4 INSTALLATION – MIRRORS

- A. Support mirrors on concealed hanger brackets. Anchor rigidly to wall construction.
- B. Place plumb and level without distortion.

3.5 PROTECTION

- A. After installation, mark glass with an 'X' using removable plastic tape.

END OF SECTION

SECTION 09 21 16

NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-structural metal studs for wall assemblies.
- B. Ceiling suspension system components and tie-wire.
- C. Steel framing for framed assemblies

1.2 RELATED SECTIONS

- A. Section 05 40 00 – Cold Formed Metal Framing
- B. Section 06 10 00 – Rough Carpentry
- C. Section 07 21 16 – Blanket Insulation

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. STM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 3. ASTM B 633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 - 4. ASTM C 645- Standard Specification for Nonstructural Steel Framing Members.
 - 5. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 6. ASTM C 847 - Standard Specification for Metal Lath.
 - 7. ASTM C 1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster (Plaster and Stucco Accessories).
 - 8. ASTM C 1396 - Standard Specification for Gypsum Board.
 - 9. STM C 1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
 - 10. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 11. ASTM E 90 - Standard Test Method for Laboratory Measurements of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 12. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 13. ASTM E 413 - Classification for Rating Sound Insulation.

- B. GA - 600 - Fire Resistance Design Manual.
- C. AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
- D. AISI - Standard for Cold-Formed Steel Framing General Provisions.

1.4 REFERENCES

- A. Design steel in accordance with American Iron and Steel Institute Publication "Specification for the Design of Cold-Formed Steel Structural Members", except as otherwise shown or specified.
- B. Design loads: As indicated on the Architectural Drawings. 5 PSF minimum design lateral load is required for interior walls by the building code. Shaftwall framing minimum design lateral load is typically 5 - 15 PSF.
- C. Design framing systems to withstand design loads without deflections greater than the following:
 - 1. Interior Non-Load Bearing Walls: Lateral deflection of: $L/240$.
- D. Design framing system to accommodate deflection of primary building structure and construction tolerances

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- B. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.
- C. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-structural steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM 119 by, and displaying a classification label from, an independent testing agency acceptable to authority having jurisdiction.
 - 1. Construct fire-resistance rated partitions in compliance with tested assembly requirements indicated on the Drawings.
 - 2. Rated assemblies to be substantiated from applicable testing using the proposed products, by Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store products in manufacturer's unopened packaging until ready for installation per requirements of ASIS's "Code of Standard Practice."
- B. Notify manufacturer of damaged materials received prior to installing.
- C. Deliver Materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1.7 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

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Acceptable Manufacturer, Metal Framing: ClarkDietrich Building Systems, 9100 Centre Pointe Dr. Suite 210, West Chester, OH 45069. Tel: (513) 870-1100. Fax: (513) 870-1300. E-mail: info@clarkdietrich.com ; Web: www.clarkdietrich.com.
 - 1. ClarkDietrich Building Systems; 501 Steward Road, Suite 100, Rochelle, IL 61068. Tel: (800) 659-0745.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 MATERIALS

- A. Cold-Formed Steel: Complying with ASTM C 645; unless indicated otherwise
- B. Protective Coating: Comply with ASTM C 645; ASTM A 653/A 653M G40 (Z120), Coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40 (Z120) or DiamondPluscoating; roll-formed from steel meeting mechanical and chemical requirements of ASTM A 1003 with a zinc-based coating. A40 galvanized products are not acceptable.
 - 1. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to the authority having jurisdiction.

2.3 FABRICATION

- A. General: Framing components may be preassembled into panels prior to erecting.
- B. Fabricate panels square, with components attached in a manner so as to prevent racking or distortion.
- C. Cut all framing components squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Hold members positively in place until properly fastened.
- D. Fasteners: Fasten components using self-tapping screws or welding.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.
- B. If Substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 ERECTION

- A. Install cold-formed framing in accordance with requirements of ASTM C 754.
- B. Framing Installation:
 - 1. Erect framing and panels plumb, level and square in strict accordance with approved drawings.

2. Handle and lift prefabricated panels in a manner to not cause distortion in a member.
 3. Anchor runner track securely to the supporting structure. Install concrete anchors only after full compressive strength has been achieved.
 4. Butt all track joints. Securely anchor abutting pieces of track to a common structural element, or splice them together.
 5. Align and plumb studs, and securely attach to the flanges or webs of both upper and lower tracks.
 6. Attach wall stud bridging when required in a manner to prevent stud rotation. Space bridging rows according to manufacturer's recommendations.
 7. Provide temporary bracing until erection is completed.
 8. Where indicated in the drawings, provide for structural vertical movement using means in accordance with manufacturer's recommendations.
 9. Cut all framing components square for attachment to perpendicular members or as required for an angular fit against abutting members.
- C. Drywall Penetration Barrier Mesh Installation:
1. Barrier Mesh sheets may be installed with diamond running in direction most suitable.
 2. Mesh Clips to be installed to secure the mesh to the framing members.
 3. Mesh joints occurring on framing members may either join staggered or butt together.
 4. It is acceptable to overlap mesh joints to achieve tie-in.
 5. BM Sheets shall join, begin and terminate on a framing member.
 6. BM sheets not joining on framing member shall be wire tied appropriate gage steel tie wire.
 7. Wire tying shall be no less frequent than the installation of Mesh Clips

3.3 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Acoustical insulation.
2. Gypsum board.
3. Taping and bedding of gypsum board.

B. Related Sections:

1. Division 01: General Requirements; Administrative, procedural, and temporary work requirements.
2. Section 07 92 00 - Joint Sealers.

1.2 REFERENCES

A. American National Standards Institute (ANSI):

1. A108.11 - Interior Installation of Cementitious Backer Units.
2. A118.9 - Test Methods and Specifications for Cementitious Backer Units.

B. ASTM International (ASTM):

1. C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
2. C514 - Standard Specification for Nails for the Application of Gypsum Wallboard.
3. C665 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Wood Frame and Light Construction Buildings.
4. C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Board.
5. C1047 - Standard Specifications for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
6. C1178 - Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.
7. C1396 - Standard Specification for Gypsum Board.
8. C1629 - Standard Classification for Abuse-Resistant Non-decorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
9. D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
10. E90 - Standard Test Method for Airborne Sound Transmission Loss of Building Partitions.

11. E413 - Standard Test Method for Classification for Rating Sound Insulation.
- C. Gypsum Association (GA):
 1. GA-214 - Levels of Gypsum Board Finish.
 2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
 3. GA-600 - Fire Resistance Design Manual.
- D. Underwriters Laboratories, Inc. (UL) - Fire Resistance Directory.

1.3 QUALITY ASSURANCE

- A. Fire Resistance Ratings:
 1. Construct assemblies to achieve fire resistance ratings indicated on Drawings, in accordance with referenced UL design number.
 2. If requirements of assembly numbers referenced conflict with Contract Document requirements, conform to assembly requirements.
- B. Acoustic Ratings: Construct assemblies to achieve acoustic ratings indicated on Drawings, tested to ASTM E90 and classified in accordance with ASTM E413.

1.4 PROJECT CONDITIONS

- A. Do not install gypsum board until building is substantially weathertight.
- B. Maintain temperature in spaces in which work is being performed above 50 degrees F during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Gypsum Panels:
 1. CertainTeed Gypsum, Inc. (www.certainteed.com)
 2. GP Gypsum Corporation. (www.gp.com)
 3. National Gypsum Co. (www.nationalgypsum.com)
 4. USG Corporation. (www.usg.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS - GYPSUM PANELS

- A. Regular Gypsum Board: ASTM C1396; 48 inches wide x 5/8 inch thick, maximum practical length, tapered edge.
- B. Fire Resistant Gypsum Board: ASTM C1396, Type X; 48 inches wide x 5/8 inch thick, maximum practical length, tapered edge; apply to fire rated assemblies.
- C. Water Resistant Gypsum Board: ASTM C1396; 48 inches wide x 5/8 inch thick maximum practical length, water resistant; apply to walls to receive tile and walls at janitor closets.
- D. Shaft Wall Liner: ASTM C1396; 1 inch thick x 24 inches wide, maximum practical length, square edges.

2.3 ACCESSORIES

- A. Fasteners: ASTM C1002, Type S screws, ASTM C514, drywall nails, minimum 5/8 inch penetration into framing.
- B. Acoustical Insulation:
 - 1. Specified in Section 07 21 16.
- C. Adhesive:
 - 1. Type recommended by gypsum panel manufacturer.
 - 2. Maximum volatile organic compound (VOC) content: 50 grams per liter.
- D. Trim Accessories: ASTM C1047.
 - 1. Material: Vinyl trim, perforated flanges
 - 2. Corner reinforcement: GA-216, Type CB-100 x 100.
 - 3. Casing: GA-216, Type LC.
 - 4. Control joint.
 - 5. Specified in Section 09 29 40 – Gypsum Vinyl Trim and Accessories
- E. Acoustical Sealer: Specified in Section 07 92 00 – Joint Sealers.
- F. Joint Treatment Materials:
 - 1. Reinforcing tape and joint compound; ASTM C475.
 - 2. Joint compound; maximum volatile organic compound (VOC) content: 250 grams per liter.

PART 3 EXECUTION

3.1 INSTALLATION OF GYPSUM PANELS

- A. Install panels and accessories in accordance with ASTM C754, GA-216, and manufacturer's instructions.
- B. Accurately cut panels to fit around openings and projections. Do not tear face paper or break gypsum core.
- C. Apply panels at non fire-rated assemblies in most economical manner, with ends and edges occurring over supports.
- D. Apply panels at fire-rated assemblies as required by design assembly.
- E. Stagger joints on opposite sides of partitions.
- F. Do not locate joints to align with edges of openings unless a control joint is installed.
- G. Mechanically fasten single layer panels to framing. Place fasteners minimum 3/8 inch from edges of panels; drive heads slightly below surface. Stagger fasteners at abutting edges.
- H. Apply face layer of double layer applications with joints offset from those in base layer; secure with mechanical fasteners to framing or with adhesive to base layer.

- I. At deflection compensating head tracks, cut panels 1/2 inch short of structure at head; do not secure panels to top runner channel.
- J. Treat cut edges and holes in moisture resistant gypsum board with joint sealer.
- K. Where recessed items occur in fire rated partitions, box item on all sides with gypsum board as required to maintain continuity of fire rating.

3.2 INSTALLATION OF ACOUSTICAL PARTITIONS

- A. Extend acoustical partitions past intersecting non-acoustical partitions.
 - B. Install acoustical insulation:
 - 1. Butt to framing members and adjacent construction.
 - 2. Carry around pipes, wiring, outlets, and other construction without voids.
 - 3. Press against one gypsum board surface to form slight air space on opposite side.
 - C. Seal acoustical partitions at perimeter and around penetrations:
 - 1. Apply continuous bead of sealer between gypsum panel edges and adjacent construction.
2. Seal space between gypsum panels at control joints, prior to installing metal control joint.
- 3. Apply sealer to penetrations through partitions.

3.3 INSTALLATION OF ACOUSTICAL INSULATION ABOVE CEILINGS

- A. Install acoustical insulation in continuous layer. Butt tightly to adjacent insulation and to other construction.
- B. Carry over pipes, wiring, boxes, and other construction without voids.

3.4 INSTALLATION OF SHAFT WALL SYSTEM

- A. Install in accordance with manufacturer's instructions.
- B. Cut liner panels $\frac{3}{4}$ inch less than wall height; install vertically between runners.
- C. Progressively install succeeding studs and liner panels.
- D. Apply gypsum panels to one or both sides as required by fire assembly description.

3.4 INSTALLATION OF ACCESSORIES

- A. Install in accordance with manufacturer's instructions.
- B. Install corner reinforcement at outside corners. Use single lengths where length of corner does not exceed standard length.
- C. Install casings where indicated and where gypsum board abuts dissimilar materials or stops with edge exposed.
- D. Install control joints at ceilings:
 - 1. At maximum 50 feet on center.
 - 2. Where ceiling framing changes direction.

- E. Install control joints at walls and partitions:
 - 1. At changes in backup material.
 - 2. At maximum 30 feet on center.
 - 3. Above one jamb of openings in partitions.

3.5 JOINT TREATMENT

- A. Treat joints and fasteners in gypsum board in accordance with GA-214.
- B. Levels of Finish:
 - 1. Surfaces in janitor closet: Level 1 finish.
 - 2. Surfaces to receive tile: Level 2 finish.
 - 3. Surfaces to receive flat or eggshell paints: Level 4 finish.
 - 4. Surfaces to receive semigloss paints: Level 5 finish.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 09 29 40

GYPSUM VINYL TRIM AND ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Vinyl trims and accessories for gypsum board.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 07 92 00 - Joint Sealants.
- C. Section 09 91 00 - Painting

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 2. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board.
 - 3. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard.
 - 4. ASTM C 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPCV) Compounds.
 - 5. ASTM D 3678 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Interior-Profile Extrusions.
 - 6. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. Gypsum Association (GA):
 - 1. GA-214 - Recommended Levels of Gypsum Board Finish.
 - 2. GA-216 - Application and Finishing of Gypsum Panel Products.
 - 3. GA-600 - Fire Resistance Design Manual.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 – Administrative Requirements.
- B. Product Data: Submit data on each type of vinyl trim and accessory.
 - 1. Storage and handling requirements and recommendations.
 - 2. Preparation and installation instructions and recommendations.
 - 3. Cleaning methods.
- C. Informational Submittals:

1. Materials Resources Certificates:
 - a. Certify recycled material content.
 - b. Certify distance from Project site for local and regional materials.
2. Indoor Air Quality Certificates: Certify Volatile Organic Compound (VOC) content for each interior adhesive, sealant, and primer.
3. Product Cost Data: Submit cost of products to verify compliance with project sustainable design requirements. Exclude cost of labor and equipment to install products. Provide cost data for the following products:
 - a. Products with recycled material content.
- D. Selection Samples: Two sets of full size samples, 9 inches (220 mm) length, representing manufacturer's full range of available trim products and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
 1. Store in covered area away from direct sunlight.
 2. Stack boxes containing trim members flat to prevent sagging.
- B. Store materials in manufacturer's original sealed, labeled packaging until ready for installation and in accordance with manufacturer's instructions. Protect from damage.

1.6 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 recommended limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: TRIM-TEX Inc., which is located at: 3700 West Pratt Avenue; Lincolnwood, IL 60712-2508; Toll Free Tel: 800-874-2333; Fax: 800-644-0216; Email:[request info \(info@trim-tex.com\)](mailto:info@trim-tex.com); Web:<http://www.trim-tex.com>.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 TRIM MEMBERS

- A. Basis of Design: Vinyl trim for gypsum board as manufactured by Trim-Tex Inc.; including accessories and joint treatments.
 1. Location of Manufacture: Lincolnwood IL.
- B. Performance Requirements:
 1. Self-Extinguishing: Shall not continue to support combustion when flame source is removed.
 2. Meet or exceed the following ASTM Standards:

- a. ASTM E84 - Achieve Class A rating for Smoke and Flame Spread.
- b. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard.
- c. ASTM C 1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPCV) Compounds.
- d. ASTM D 3678 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Interior-Profile Extrusions.
- e. GA-216 - Application and Finishing of Gypsum Panel Products.

2.3 CORNER BEADS

A. Standard Corner Beads:

1. Rigid Low Profile Corner. 90 Degree Outside. 1-3/8 inch (35 mm) mud flange. Arch available.
2. Rigid Jumbo Low Profile Corner. 90 Degree Outside 1-3/4 inch (44 mm) mud flange. Arch available.
3. Corner Bead. 90 Degree Outside. 1-1/4 inch (32 mm) mud flange. Arch available.
4. Jumbo Corner Bead. 90 Degree Outside 1-3/4 inch (44 mm) mud flange. Arch available.
5. Arch Plus 90 Degree Combo Bead. 90 Degree and Arch in One. 1-1/4 inch (32 mm) mud flange.
6. Skim Coat Plaster Corner. 90 Degree Outside 1-3/4 inch (44 mm) mud flange.
7. Rigid Splayed Adjustable Corner. 115 Degree-155 Degree Outside. 1-3/8 inch (35 mm) mud flange.
8. Splayed Corner Bead. 120 Degree-140 Degree Outside. 1-1/4 inch (32 mm) mud flange.
9. Jumbo Splayed Corner. 120 Degree-140 Degree Outside. 1-3/4 inch (44 mm) mud flange. Arch available for groin ceilings.
10. Adjustable Inside Corner. 70 Degree-150 Degree Inside. 1 inch (25 mm) mud flange.
11. Inside Corner Bead. 90 Degree Inside. Arch available.

B. Bumper Bead Corner Protection System:

1. For the Trim-Tex Two-Part Bumper Bead, Bumper Guard Corner Protection System, please reference Section 10 26 13 - Corner Guards.

C. Mud Set Beads (Beads installed using drywall compound like paper flange beads.):

1. Mud Set Rigid Low Profile Corner Bead. 90 degree Outside. 1-3/8 inch mud flange.
2. Mud Set Rigid Low Profile Jumbo Corner. 90 degree Outside. 1-3/4 inch mud flange.

3. Mud Set Adjustable Splayed Corner. 115 degree-155 degree Outside. 1-3/8 inch mud flange.
4. Mud Set Adjustable Inside Corner. 70 degree-150 degree Inside. 1 inch mud flange.
5. Mud Set Magic Corner. Full adjustable inside. Flexible center for expansion control and crack prevention. 1 inch mud flange.
6. Mud Set 350 Bull. 90 degree Outside. 1 inch mud flange.
7. Mud Set 3/4 inch R. Bullnose Corner Bead. 90 degree Outside. 7/8 inch mud flange.
8. Mud Set 3/4 inch R. Bullnose Splayed. 115 degree-155 degree Outside. 3/4 inch mud flange.
9. Mud Set L Bead & Flat Tear Away. For finishing drywall ends terminating at building components such as windows and doors.

2.4 COMMERCIAL BEADS

- A. Deflection Beads (For Head of Wall Details):
 1. Wall Mounted Deflection Bead. For deflection of up to 7/16 inch (11 mm) use Wall Mounted Deflection Bead. Wall Mounted Deflection Bead is not designed for major uplift. Minor uplift can be easily caulked. Always follow installation instructions included with product.
 2. Ceiling Mounted Deflection Bead. For deflection of up to 3/4 inch (19 mm) use Ceiling Mounted Deflection Bead. Ceiling Mounted Deflection Bead has a 1 inch (25 mm) vertical leg and can also cover up to 1/4 inch (6 mm) of uplift. You can also leave the drywall higher and cover for example, 1/2 inch (12 mm) of deflection and 1/2 inch (12 mm) of uplift. Always follow installation instructions included with product.
- B. Expansion Beads (Control Joints):
 1. 093V Expansion. C and T Intersections available.
 2. Hideaway Expansion.
 3. Magic Corner.
- C. Acoustical and Ceiling Beads:
 1. Flex Grid Angle. For 7/8 inch (22 mm) or 9/16 inch (14 mm) grid. White or Black. Finish columns and curved soffits around acoustical ceilings.
 2. Mud on Ceiling Bead. For 7/8 inch (22 mm) or 9/16 inch (14 mm) grid. Finish partition walls butting to existing acoustical ceiling.
 3. L.E.D. Light Bead. Finishes drywall end and creates a flange for low profile LED strip (sold separately).
 4. Architectural Access Door Bead. Creates clean transition with subtle 1/4 inch (6mm) step, provides a flange for access door to rest on. Can also be used to trim light fixtures when installed in a gypsum ceiling.

D. Fast Caps:

1. Fast Cap. For 3-5/8 inch (76 mm) metal stud and 5/8 inch (15.8 mm) drywall. Arch available.
2. Fast Cap for 2-1/2 inch (63 mm) metal stud.
3. 3/4 inch (19 mm) R. Bullnose Fast Cap. Arch available.

2.5 ACCESSORIES

- A. Spray Adhesive: Trim-Tex #847.
- B. Divergent Staples: Duo-Fast 1/2 inch (12 mm) divergent staples.
- C. Drywall Compound Adhesion Additive: Mud Max.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Verify site conditions are ready to receive work.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install vinyl trim members in accordance with manufacture's written instructions and comply with the following:
 1. ASTM C 754.
 2. ASTM C 840.
 3. GA-214.
 4. GA-216.
 5. GA-600.
 6. As scheduled and indicated on drawings.
 7. Where manufacturer's installation instructions do not specifically cover specific installation; comply with ASTM C 754, GA-216 and GA-600 as applicable.
- B. Secure trim members to substrate with staples and spray adhesive in accordance with trim manufacturer's written instructions.
 1. Install factory fabricated accessories at joints in trim members with durable:
 - a. Straight edges.
 - b. Straight corners.

- c. Smooth curvatures.
 - d. True arches.
 - 2. Apply specified mud to flanges of trim members.
 - C. Control Joints: Place control joints consistent with lines of building spaces as indicated on Drawings and the following:
 - 1. At changes in substrate construction.
 - 2. Where a gypsum wall or ceiling runs in an uninterrupted straight plan exceeding 30 feet (9.14 m) horizontally or vertically.
 - 3. Align control joints with architectural features and as directed by the Architect.
 - D. Interior Trim: Install in the following locations:
 - 1. Corner Bead: Use at outside corners; type as indicated on drawings.
 - 2. Deflection Bead: Use at head of wall or as indicated on drawings.
 - 3. J or L Bead. Use at exposed panel edges or as indicated on drawings.
 - 4. Other trims. Use as indicated on drawings.
- 3.3 PROTECTION
- A. Protect installed products until completion of project.
 - B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic and Porcelain tile floor and wall finishes.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A108/A118/A136.1 - American National Standard for Installation of Ceramic Tile.
 - 2. A137.1 - Specifications for Ceramic Tile.
- B. Tile Council of North America (TCNA) - Handbook for Ceramic, Glass, and Stone Tile Installation.
- C. Resilient Floor Covering Institute (RFCI) - FloorScore Certification Program.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's installation, cleaning, and maintenance instructions.
 - 2. Samples:
 - a. Tile: Full size samples in each color.
 - b. Grout: 1/2 x 1/2 x 3 inch long samples showing available colors.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum [5] years experience in work of this Section.
- B. Tile and Trim Units: Meet ANSI A137.1, Standard Grade.
- C. Dynamic Coefficient of Friction for Floor Tile: Minimum 0.42, tested in accordance with ANSI A137.1 using BOT 3000 tribometer.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver mortar, adhesive, and grout containers bearing hallmark certifying compliance with reference standards.
- B. Protect adhesive containers from freezing and overheating according to manufacturer's instructions.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain minimum ambient temperature of 50 degrees F during and after installation.

1.7 MAINTENANCE

- A. Extra Materials: One unopened carton of each tile.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Tile:
 - 1. Atlas Concorde (atlasconcorde.com)
 - 2. Ceramic Tiles International (virginiatile.com)
- B. Acceptable Manufacturers - Setting and Grouting Materials:
 - 1. BASF Corporation. (www.buildingsystems.basf.com)
 - 2. Bostik, Inc. (www.bostik-us.com)
 - 3. Laticrete International, Inc. (www.laticrete.com)
 - 4. Mapei Corporation. (www.mapei.us)
 - 5. TEC. (www.tecspecialty.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Tile: As specified in Drawings.

2.3 ACCESSORIES

- A. Latex-Portland Cement Mortar: ANSI A118.4, polymer modified dry set type.
- B. Dry Set Portland Cement Mortar: ANSI A118.1, polymer modified dry set type.
- C. Epoxy Adhesive:
 - 1. ANSI A118.3, thin set bond type.
 - 2. Maximum volatile organic compound (VOC) content: 65 grams per liter.
- D. Organic Adhesive:
 - 1. ANSI A136.1, Type 1,] [2,] thin set bond type.
 - 2. Maximum volatile organic compound (VOC) content: 65 grams per liter.
- E. Portland Cement: ASTM C150, Type 1, white color.
- F. Sand: ASTM C144, clean, free of organic matter.
- G. Lime: ASTM C207, Type S, hydrated.
- H. Water: Clean, potable.
- I. Grout:

1. ANSI A118.6, polymer modified type, sanded.
 2. Color: To be selected from manufacturer's full color range.
 3. Joint Sealers: Specified in Section 079200.
- J. Waterproof Membrane:
1. Type: Load bearing, single component, cold liquid applied type.
 2. Source: Schluter Systems or approved substitute.
- K. Joint Tape: Waterproof, perforated bedding tape.
- PART 3 EXECUTION**
- 3.1 PREPARATION**
- A. Clean surfaces to remove loose and foreign matter that could impair adhesion.
 - B. Remove ridges and projections. Fill voids and depressions with patching compound compatible with setting materials.
 - C. Allowable Substrate Tolerances:
 1. Thin set method:
 - a. Maximum variation in substrate surface: 1/8 inch in 8 feet.
 - b. Maximum height of abrupt irregularities: 1/32 inch.
 2. Thick set method: Maximum 1/4 inch in 10 feet variation in substrate surface.
 - D. Test concrete substrate to ASTM D4263; do not install tile until surfaces are sufficiently dry.
- 3.2 INSTALLATION**
- A. Install waterproof membrane in accordance with manufacturer's instructions.
 - B. Methods:
 1. Walls: A108.5, thin set with latex-Portland cement mortar.
 2. Floors: ANSI A108.5, thin set with latex-Portland cement mortar.
 3. Shower walls:
 - a. Fill joints between cementitious backer board with mortar. Apply tape centered over joint; skim coat with mortar.
 - b. Install tile in accordance with ANSI A108.5, thin set with latex-Portland cement mortar.
 4. Shower floors:
 - a. Surround floor drain with broken tile or crushed stone.
 - b. Install tile in accordance with ANSI A108.1B, thick set with reinforced Portland cement mortar and latex-Portland cement mortar.
 - C. Minimize pieces less than one half size. Locate cuts to be inconspicuous.
 - D. Lay tile to pattern shown on Drawings. Do not interrupt tile pattern through openings.

- E. Joint Width: 1/8 inch, plus or minus 1/16 inch.
- F. Make joints watertight, without voids, cracks, excess mortar, or excess grout. Align joints in wall and floor of same-sized tile.
- G. Fit tile around projections and at perimeter. Smooth and clean cut edges. Ensure that trim will completely cover cut edges.
- H. Install Trim:
 - 1. Inside corners: Cove units.
 - 2. Outside corners: Bead units.
 - 3. Base: Base units.
 - 4. Exposed tile ends: Bullnose units.
- I. Allow tile to set for a minimum of 48 hours before grouting.
- J. Grout tile joints in accordance with ANSI A108.10 without excess grout.
- K. Control Joints:
 - 1. Provide control joints at:
 - a. Changes in backup material.
 - b. Changes in plane.
 - c. Over joints in substrate.
 - d. Maximum 24 feet on center at interior locations except maximum 8 feet at surfaces exposed to direct sunlight.
 - e. Maximum 16 feet on center at exterior locations.
 - 2. Form joints per TCNA Method EJ-171.
 - 3. Install joint backing and joint sealer as specified in Section 079200.

3.3 ADJUSTING

- A. Remove and replace pieces that have been damaged during installation.

3.4 PROTECTION

- A. Provide protection for completed work using non-staining sheet coverings.
- B. Prohibit traffic on tile floors for minimum 3 days after installation.

END OF SECTION

SECTION 09 50 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes

1. Acoustical ceiling panels
2. Exposed grid suspension system
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
4. Perimeter Trim

B. Alternates

1. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability and approved products will be set forth by the Addenda. If included in a Bid are substitute products that have not been approved by Addenda, the specified products shall be provided without additional compensation.
2. Submittals that do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); Underwriters' Laboratories Classified Acoustical performance; Panel design, size, composition, color, and finish; Suspension system component profiles and sizes; Compliance with the referenced standards.

1.3 REFERENCES

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

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
9. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material
 - a. Armstrong Fire Guard Products
10. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
11. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems
12. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
13. ASTM E 1264 Classification for Acoustical Ceiling Products
- B. International Building Code
- C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality
- D. NFPA 70 National Electrical Code
- E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
- F. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
- G. International Code Council-Evaluation Services Report - Seismic Engineer Report
 1. ESR 1308 - Armstrong Suspension Systems
- H. International Association of Plumbing and Mechanical Officials - Seismic Engineer Report
 1. 0244 - Armstrong Single Span Suspension Systems
- 1.4 SYSTEM DESCRIPTION
 1. Continuous/Wall-to-Wall
- 1.5 SUBMITTALS
 - A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

- B. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- C. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with, or supported by the ceilings.
- D. Acoustical Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
 - a. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
 - 1. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 2. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.
 - 3. Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory
- B. Acoustical Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.
- C. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units 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 ceiling units, permit them to reach room temperature and a stabilized moisture content.

- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

A. Space Enclosure:

Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

HumiGuard Max Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Ceilings with HumiGuard Max performance can be installed in conditions up to 120°F (49°C) and maximum humidity exposure including outdoor applications, and other standing water applications, so long as they are installed with either SS Prelude Plus, AL Prelude Plus, or Prelude Plus Fire Guard XL suspension systems. Products with Humiguard Max performance can be installed in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling. Only Ceramaguard with AL Prelude Plus suspension system can be installed over swimming pools.

1.9 ALTERNATE CONSTRUCTION WASTE DISPOSAL

- A. Contact the Armstrong Recycle Center a consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant with provide assistance to facilitate the recycling of the ceiling.

1.11 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
 - 1. Acoustical Panels: Sagging and warping
 - 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
 - 1. Acoustical panels: Ten (10) years from date of substantial completion
 - 2. Suspension: Ten (10) years from date of substantial completion
 - 3. Ceiling System: Thirty (30) years from date of substantial completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run

concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.12 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Ceiling Panels:
 - 1. Armstrong World Industries, Inc.
- B. Suspension Systems:
 - 1. Armstrong World Industries, Inc.
- C. Perimeter Systems
 - 1. Armstrong World Industries, Inc.

2.2.1 ACOUSTICAL CEILING UNITS

- A. Acoustical Panels Type AP
 - 1. Surface Texture: Smooth
 - 2. Composition: Mineral Fiber
 - 3. Color: White
 - 4. Size: 24 in x 48 in
 - 5. Edge Profile: Square Lay-In 15/16 in for interface with PRELUDE XL 15/16" Exposed Tee grid.
 - 6. Noise Reduction Coefficient(NRC):
 - 7. Ceiling Attenuation Class (CAC) : ASTM C 1414; Classified with UL label on product carton 33
 - 8. Sabin:N/A
 - 9. Articulation Class (AC):
 - 10. Flame Spread: ASTM E 1264; Class A (UL)
 - 11. Light Reflectance (LR) White Panel: ASTM E 1477; 0.89
 - 12. Dimensional Stability: HumiGuard Plus
 - 13. Recycle Content: Post-Consumer - 3% Pre-Consumer - 33%

14. Acceptable Product: KITCHEN ZONE, 672 as manufactured by Armstrong World Industries

2.3.1 METAL SUSPENSION SYSTEMS

A. Components:

Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

- a. Structural Classification: ASTM C 635 Heavy Duty duty
 - b. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 - c. Sustainability: Environmental Product Declaration (EPD), Health Product Declaration (HPD)
 - d. Acceptable Product: PRELUDE XL 15/16" Exposed Tee as manufactured by Armstrong World Industries
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.
- D. Edge Moldings and Trim:
- E. Accessories:

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
- 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

- A. Follow manufacturer installation instructions.

- B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
- C. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
- D. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- E. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove any ceiling products that cannot be successfully cleaned and or repaired. Replace with attic stock or new product to eliminate evidence of damage.
- C. Before disposing of ceilings, contact the Armstrong Recycling Center at 877-276-7876, select option #1 then #8 to review with a consultant the condition and location of building where the ceilings will be removed. The consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant will provide assistance to facilitate the recycle of the ceiling.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 09 65 13

RESILIENT BASE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient wall base.
- B. Related Sections:
 - 1. Division 01: General Requirements; Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM) F1861 - Standard Specification for Resilient Wall Base.
- B. Resilient Floor Covering Institute (RFCI) – Floor Score Certification Program.

1.3 MAINTENANCE

- A. Extra Materials: One unopened carton of each profile and color.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.6 PROJECT CONDITIONS

- A. Install resilient products after other finishing operations, including painting, have been completed.
- B. Maintain ambient temperatures within range recommended by Johnsonite, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- C. Maintain the ambient relative humidity between 40% and 60% during installation.

- D. Until Substantial Completion, maintain ambient temperatures within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Base:
 - 1. Johnsonite, Inc. (www.johnsonite.com)
 - 2. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Resilient Wall Base: Johnsonite – Traditional Vinyl Wall Base
 - 1. Manufactured from a homogeneous composition of polyvinyl chloride (PVC).
 - 2. Meets performance requirements for ASTM F 1861 Standard Specification for Resilient Wall Base, Type TV, Group 1.
 - 3. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm² or greater, Class I.
 - 4. ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, Class B, Smoke <450.
 - 5. Flexibility: Does not crack, break, or show any signs of fatigue when bent around a 1 1/4" diameter cylinder when tested according to ASTM F 137 Standard Test Method for Flexibility of Resilient Flooring Materials protocols.
 - 6. Color Stability: Meets or exceeds ASTM F 1861 requirements for color stability when tested to ASTM F 1515 Standard Test Method for Measuring Light Stability of Resilient Flooring protocols.
 - 7. Contains at least 14% pre consumer recycled content.
 - 8. Phthalate free except for recycled materials.
 - 9. Possible LEED contributions include MR:2, MR:4, MR:5, and EQ: 4.3
 - 10. Johnsonite offers a RESTART reclamation program for returning jobsite scrap.
 - 11. 100% Recyclable.
 - 12. SCS FloorScore® Certified and meets California Specifications Section 01350.
 - 13. Johnsonite facilities are ISO 9001 and ISO 14001 Certified.
 - a. Traditional Vinyl Wall Base: 1/8" thick
 - i. Coved base– CB
 - ii. Color – 32 Pebble
 - iii. Height: 4"
 - iv. Length: 120' coils for 2 1/2" or 4" height 1/8" thick wall base

- b. Traditional Vinyl Wall Base: 1/8" thick
 - i. Straight base (toeless) – CBT (for carpet)
 - ii. Color – 32 Pebble
 - iii. Height: 4"
 - iv. Length: 120' coils for 2 1/2" or 4" height 1/8" thick wall base

2.3 ACCESSORIES

- A. Adhesive:
 - 1. Water based, waterproof, recommended by base manufacturer.
 - 2. Maximum volatile organic compound (VOC) content: 50 grams per liter.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare surfaces to receive base:
 - 1. Remove materials that could interfere with adhesion.
 - 2. Fill low spots with patching compound; finish flush with adjacent surface.
 - 3. Remove high spots, ridges and nibs.

3.2 INSTALLATION

- A. Apply adhesive continuously to back of base.
- B. Maintain top edge true to line and bottom edge in continuous contact with floor. Butt joints tight; butt base tight to adjacent construction.
- C. Do not install pieces less than 6 inches long.
- D. Miter and butt inside corners.
- E. At outside corners "V" cut back of base to 2/3 of its thickness and bend around corner.
- F. Scribe to door frames and other interruptions.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 09 65 19

RESILIENT TILE FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.
- B. Related Documents
 - 1. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.
- C. Related Sections:
 - 1. Other Division 9 sections for floor finishes related to this section but not the work of this section
 - 2. Division 3 Concrete; not the work of this section
 - 3. Division 6 Wood and Plastics; not the work of this section
 - 4. Division 7 Thermal and Moisture Protection; not the work of this section

1.2 REFERENCES

- A. Armstrong Flooring Technical Manuals
 - 1. Armstrong Flooring Guaranteed Installation Systems manual, F-5061
 - 2. Armstrong Flooring Maintenance Recommendations and Procedures, manual, F-8663
- B. ASTM International:
 - 1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
 - 2. ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
 - 3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - 4. ASTM F 1066 Standard Specification for Vinyl Composition Tile
 - 5. ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring
 - 6. ASTM F 1861 Standard Specification for Resilient Wall Base
 - 7. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

8. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide flooring which has been manufactured, fabricated and installed to performance criteria certified by manufacturer without defects, damage, or failure.
- B. Administrative Requirements
 1. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.
 2. Pre-installation Testing: Conduct pre-installation testing as follows: [Specify testing (i.e. moisture tests, bond test, pH test, etc)]
- C. Sequencing and Scheduling
 1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.
 2. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

1.4 SUBMITTALS

- A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions (latest edition of Armstrong Flooring Guaranteed Installation Systems manual, F-5061) for flooring and accessories.
- B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.
- C. Submit Safety Data Sheets (SDS) available for flooring products, adhesives, patching/leveling compounds, floor finishes (polishes) and cleaning agents.
- D. If required, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.
- E. Closeout Submittals: Submit the following:
 1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 2. Warranty: Warranty documents specified herein

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.
- B. Select an installer who is competent in the installation of Armstrong resilient vinyl composition tile flooring.
 - 1. Engage installers certified as Armstrong Commercial Flooring Certified Installers
 - 2. Confirm installer's certification by requesting their credentials
- C. Fire Performance Characteristics: Provide resilient vinyl composition tile flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:
 - 1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I
 - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less
 - 3. CAN/ULC-S102.2 – Flame Spread Rating and Smoke Developed – Results as tested.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with Division 1 Product Requirements Sections
- B. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.
- D. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.7 PROJECT CONDITIONS

- A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65°F (18°C) and a maximum temperature of [100°F (38°C)][85°F (29°C)] for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances. Refer to the Armstrong Flooring Guaranteed Installations Systems manual, F-5061 for a complete guide on project conditions.

1.8 LIMITED WARRANTY

- A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreeing to repair or replace resilient flooring that fails within the warranty period.
- B. Limited Warranty Period: 5 years
- C. Limited Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.
- D. For the Limited Warranty to be valid, this product is required to be installed using the appropriate Armstrong Flooring Guaranteed Installation System. Product installed not using the specific instructions from the Guaranteed Installation System will void the warranty.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials from same production run as products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Quantity: Furnish quantity of flooring units equal to [] % of amount installed.
 - 2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra material.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Resilient tile flooring, wall base, adhesives and accessories:
 - 1. Armstrong Flooring Inc., 2500 Columbia Avenue, Lancaster, PA 17604, www.armstrongflooring.com/commercial
 - 2. Manufacturer must have a headquarters in the United States of America

2.2 RESILIENT TILE FLOORING MATERIALS

- A. Provide Vinyl Composition Tile: EXCELON® Feature™ Tile, Strips & Insets manufactured by Armstrong Flooring, Inc.
 - 1. Description: Tile composed of polyvinyl chloride resin, plasticizers, fillers, stabilizers and pigments with colors and texture dispersed uniformly throughout its entire thickness.
 - 2. Vinyl composition tile shall conform to the requirements of ASTM F 1066, "Standard Specification for Vinyl Composition Floor Tile", Class 1, Solid Color Tile
 - 3. Pattern and Color: Mystix Aria Greige NA776
 - 4. Size: 18 in. x 18 in.
 - 5. Thickness: 1/8" / 0.125 in. (3.2mm)

2.3 PRODUCT SUBSTITUTION

- A. Substitutions: Any Substitutions will be considered in accordance with provisions of Section 01 60 00 – Product Requirements

2.4 WALL BASE MATERIALS

- A. For top set wall base: Provide [0.080 in. (2.0 mm)] [1/8 in. (3.2 mm)] thick, [2 1/2 in. (6.35 cm)] [4 in. (10.16 cm)] [6 in. (15.24 cm)] high Armstrong Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, [Type TV - Vinyl, Thermoplastic] [Type TP - Rubber, Thermoplastic], Group 1 - Solid, [Style A – Straight] [Style B – Cove].

2.5 ADHESIVES

- A. For Tile Installation System, Full Spread: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] [S-700 Floor Tile Adhesive Thin Spread] [S-750 Premium Floor Tile Adhesive] [S-240 Epoxy Adhesive] under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.
- B. [For Tile Installation System, Tile On: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] [S-750 Floor Tile Adhesive Thin Spread] under the tile over smooth, completely bonded existing resilient flooring and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].
- C. [For Tile High-Moisture Installation Warranty, Full Spread: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].
- D. [For Spray Adhesive High-Moisture Installation Warranty, Full Spread: Provide Armstrong Flip™ Spray Adhesive for field areas and S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].

2.6 ACCESSORIES

- A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Armstrong [S-184 Fast-Setting Cement-Based Patch and Underlayment] [S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive].
- B. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.
- C. Provide transition/reducing strips tapered to meet abutting materials.
- D. Provide threshold of thickness and width as shown on the drawings.
- E. Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

- F. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog, installation instructions, and product carton instructions for installation and maintenance procedures as needed.

3.2 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions (i.e. moisture tests, bond test, pH test, etc.).
- B. Visually inspect flooring materials, adhesives and accessories prior to installation. Flooring material with visual defects shall not be installed and shall not be considered as a legitimate claim.
- C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.
- E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.3 PREPARATION

- A. Subfloor Preparation: Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Armstrong [S-184 Fast-Setting Cement-Based Patch and Underlayment][S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive] as recommended by the flooring manufacturer. Refer to Armstrong Flooring Guaranteed Installation Systems manual, F-5061 and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.

- B. Subfloor Cleaning: The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, sealers, release agents, curing compounds, residual adhesive, adhesive removers and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants are present on the substrate they must be mechanically removed prior to the installation of the flooring material.. Refer to the Armstrong Flooring Guaranteed Installation Systems manual, F-5061 and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.
- C. For Tile Installation System, Full Spread when using S-700 or S-750 Adhesive perform subfloor moisture testing in accordance with [ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes"] [ASTM F 1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride] and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems manual, F-5061, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 80%.] [MVER shall not exceed 5 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained]
- D. [For Tile High-Moisture Installation Warranty when using S-515 Adhesive, perform subfloor moisture testing in accordance with [ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes"] [ASTM F 1869, "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride"] and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems manual, F-5061, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 90%.] [MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained].
- E. [For Tile High-Moisture Installation Warranty when using S-525 Adhesive, perform subfloor moisture testing in accordance with [ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes"] [ASTM F 1869, "Standard Test Method for Measuring Moisture Vapor Emission Rate of

Concrete Subfloor Using Anhydrous Calcium Chloride"] and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems manual, F-5061, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 90%.][MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

- F. [For Spray Adhesive High-Moisture Installation Warranty, using Armstrong Flip™ Spray Adhesive, perform subfloor moisture testing in accordance with ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes" and Bond Tests as described in publication F-5061, "Armstrong Flooring Guaranteed Installation System," manual to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. Internal relative humidity of the concrete shall not exceed 93%. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained].
- G. Concrete pH Testing: Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained.
- H. Wood subfloors: Armstrong resilient floors are recommended on suspended wood subfloors with a 1/4" underlayment (see product installation systems for exceptions) and a minimum of 18" of well-ventilated air space below. Armstrong Flooring does not recommend installing resilient flooring on wood subfloors applied directly over concrete or on sleeper-construction subfloors. Loading requirements for subfloors are normally set by various building codes on both local and national levels. Trade associations such as APA–The Engineered Wood Association provide structural guidelines for meeting various code requirements. Subfloor panels are commonly marked with span ratings showing the maximum center-to-center spacing in inches of supports over which the panels should be placed.
 - 1. Refer to the Armstrong Flooring Guaranteed Installation Systems manual, F-5061 and ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring for additional information.
- I. Wood subfloors - Surface Cleaning: Make subfloor free from dust, dirt, grease, and all foreign materials.
 - 1. Check panels for sources of discoloration such as contamination from paint, varnish, stain overspray or spills, plumbing sealers, asphalt, heater fuel, markers or potential staining agents such as wood or bark not visible on the surface, edge sealers, logo markings, printed nail patterns and synthetic patches.
 - 2. Remove old adhesive.
 - 3. Cover adhesive, oil or wax residue with an appropriate underlayment. If the residue is tacky, place a layer of felt or polyethylene sheeting over it to prevent a cracking sound when walking on the floor.

4. Remove all paint, varnish, oil and wax from all subfloors. Many buildings constructed before 1978 contain lead-based paint, which can pose a health hazard if not handled properly. State and federal regulations govern activities that disturb lead-based painted surfaces and may also require notice to building occupants. Do not remove or sand lead-based paint without consulting a qualified lead professional for guidance on lead-based paint testing and safety precautions. Armstrong Flooring does not recommend the use of solvents to remove paint, varnish, oil, wax or old adhesive residues because the solvents can remain in the subfloor and negatively affect the new installation. Whenever sanding, be certain the work site is well ventilated and avoid breathing dust. If high dust levels are anticipated, use appropriate National Institute for Occupational Safety and Health (NIOSH) designated dust respirator. All power sanding tools must be equipped with dust collectors. Avoid contact with skin or eyes. Wear gloves, eye protection and long-sleeve, loose fitting clothes
5. For additional information on the installation and preparation of wood and board-type underlayments see the current edition of ASTM F1482, "Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring."
6. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring.

3.4 INSTALLATION OF FLOORING

- A. Install flooring in strict accordance with the latest edition of Armstrong Flooring Guaranteed Installation Systems manual, F-5061. Failure to comply may result in voiding the manufacturer's warranty listed in Section 1.08.
- B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.
- C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.
- D. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.
- E. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.5 INSTALLATION OF ACCESSORIES

- A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

- B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.
- C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.
- D. Apply [butt-type] [overlap] metal edge strips where shown on the drawings, [before] [after] flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.6 CLEANING

- A. Perform initial and on-going maintenance according to the latest edition of Armstrong Guaranteed Flooring Installation Systems manual, F-5061.

3.7 PROTECTION

- A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings. (See Finishing The Job in the latest edition of Armstrong Flooring Guaranteed Installation Systems manual, F-5061.)

END OF SECTION

SECTION 096813**TILE CARPETING****PART 1 GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Tile carpeting.
2. Edgings.

B. Related Sections:

1. Division 01: Administrative, procedural, and temporary work requirements.

1.1 REFERENCES**A. ASTM International (ASTM):**

1. D2859 - Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
2. D4258 - Standard Practice for Surface Cleaning Concrete for Coating.
3. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. E648 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
5. E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
6. F710 - Standard Practice for Preparing Concrete to Receive Resilient Flooring.
7. F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
8. F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

B. Carpet and Rug Institute (CRI):

1. Carpet and Rug Installation Standard.
2. Indoor Air Quality Testing Program.

- C. National Fire Protection Association (NFPA) 253 - Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.2 SUBMITTALS

A. Submittals for Review:

1. Shop Drawings: Indicate carpet tile locations, dye lot limitations, direction of carpet tile in each room or area, and type and location of edgings.
2. Samples:
 - a. Carpet tile: 4x4 inch samples showing available colors.
 - b. Edgings: Cap strips: 4 inch long samples showing available colors.
3. Warranty: Sample warranty form.

B. Quality Control Submittals:

1. Certificates of Compliance: Certification from an independent testing laboratory that carpet tiles meet fire hazard classification requirements.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 5years experience in work of this Section.

B. Fire Hazard Classification: Maximum flame spread/smoke developed rating of 75/125 tested to ASTM E84.

C. Mockup:

1. Size: Minimum 12 x 12 feet.
2. Show: Carpet tile color and pattern, and edgings.
3. Locate where directed.
4. Approved mockup may remain as part of the Work.

1.5 PROJECT CONDITIONS

A. Do not begin installation until painting and finishing work have been completed.

B. Environmental Requirements:

1. Temperature of spaces and subfloor between 65 and 90 degrees F.
2. Humidity in spaces to receive carpet tiles between 20 and 65 percent.

1.6 WARRANTIES

A. Furnish manufacturer's 10 year warranty providing coverage against:

1. Defective materials and workmanship.
2. Excessive fading.
3. Loss of static control.
4. Edge raveling.
5. Runs.
6. Loss of tuft bind strength.
7. Loss of face fiber.
8. Excessive wear.

1.3 MAINTENANCE

- A. Extra Materials: 100 square feet of each field tile.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers - Carpet Tiles:

1. Shaw. (www.shawcontract.com)

- B. Substitutions: Not permitted.

2.2 MATERIALS

A. Carpet Tiles:

1. Source: "Color Frame" by Shaw Contract.
2. Source: "Color Form" by Shaw Contract.
3. Source: "Spaceworx, Surround" by Shaw Contract.
4. Pattern: See plans.
5. Color: See plans.

2.3 ACCESSORIES

- A. Edgings: Preformed rubber, or approved substitute, profile required to suit conditions, color to be selected from manufacturer's full color range,

- B. Leveling Compound: Premixed, latex based.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete floors have cured a minimum 28 days and do not exhibit negative alkalinity, carbonization, or dusting.

3.2 PREPARATION

- A. Clean substrate; remove loose and foreign matter that could impede adhesion or performance of flooring.
- B. Fill cracks, voids, and depressions with leveling compound.
- C. Grind ridges and high spots smooth.

3.1 INSTALLATION OF CARPET TILES

- A. Install in accordance with CRI 104.
- B. Install carpet tile in accordance with manufacturers' instructions.
- C. Blend carpet tiles from different cartons to ensure minimal variation in color match.
- D. Lay out each room or area to minimize tiles less than one half size.
- E. Cut tile clean. Fit tiles tight to intersection with vertical surfaces without gaps.
- F. Lay carpet tile according to Floor Finish drawings, with tile direction parallel to next unit, set parallel to building lines and with corners aligned.
- G. Locate change of color or pattern between rooms under door centerline.
- H. Place carpet tile dry over substrate.
- I. Bind cut edges where not concealed by edge strips.

3.2 INSTALLATION OF EDGINGS

- A. Install strips where carpet tiles abut dissimilar flooring materials; secure to subfloor.
- B. Center strips under doors where carpet tiles terminate at door openings.
- C. Install in longest practical lengths; butt ends tight.
- D. Scribe to abutting surfaces.

3.3 CLEANING

- A. Clean spots as recommended by carpet tile manufacturer.

- B. Cut off loose threads flush with top surface.
- C. Clean with commercial vacuum cleaner.

END OF SECTION

[THIS PAGE LEFT INTENTIONALLY BLANK]

SECTION 09 72 00

WALL COVERINGS

PART 1 - GENERAL

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:
 - 1. Vinyl wall covering.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.
- B. Shop Drawings: Show location and extent of each wall-covering type. Indicate vertical and horizontal pattern placements, seams, and termination points.
- C. Samples: For each type of wall covering and for each color, pattern, texture, and finish specified, full width by 8-inch long in size.
 - 1. Wall-Covering Sample: From same production run to be used for the Work, with specified treatments applied. Mark top and face of fabric.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For wall coverings to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Wall-Covering Materials: For each type, color, texture, and finish, full width by length to equal to 20 percent of amount installed.

1.6 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for installation.
 - 1. Build mockups for each type of wall covering on each substrate required. Comply with requirements in ASTM F 1141 for appearance shading characteristics.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - B. Installer Qualifications: Minimum [5] years experience in work of this Section.
- 1.7 DELIVERY, STORAGE AND HANDLING:
- A. Deliver in original unopened containers bearing the manufacturer's name, brand name, and product designation.
 - B. Store in accordance with manufacturer's instructions.
 - C. Handle to prevent damage to material.
- 1.8 APPLICABLE PUBLICATIONS:
- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
 - B. ASTM International (ASTM):
 1. E84-14: Surface Burning Characteristics of Building Materials
 2. G21-13: Determining Resistance of Synthetic Polymeric Materials to Fungi
 - C. Code of Federal Regulation (CFR):
 1. 40 CFR 59: Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
 - D. Wallcovering Association (WA):
 1. W-101-13: Quality Standard Polymer Coated Fabric Wallcoverings
- 1.9 WARRANTY
- A. Manufacturer's Warranty: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

- 2.1 MANUFACTURERS:
- A. Acceptable Manufacturers
 1. Wolf-Gordon.
 2. Substitutions not permitted.
- 2.2 MATERIALS
- A. Vinyl wall covering: As specified in Drawings.
- 2.3 ACCESSORIES
- A. Adhesive: Mildew-resistant, nonstaining adhesive, for use with specific wall covering and substrate application indicated and as recommended in writing by wall-covering manufacturer.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide SR Wood, Inc.; Forestree or comparable product certified as acceptable by SR Wood, Inc.

2. Adhesives shall have a VOC content of [50] <Insert value> g/L or less.
3. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.

PART 3 - EXECUTION

3.1 JOB CONDITIONS:

A. Temperatures:

1. Do not perform work until surfaces and materials have been maintained at minimum of 16 degrees C (60 degrees F) for three (3) days before work begins.
2. Maintain minimum temperatures of 16 degrees C (60 degrees F) until adhesives are dried or cured.

B. Lighting:

1. Do not proceed unless a minimum lighting level of 15 candela per 0.09 square meter (15 candela per square foot) is provided.
2. Measure light level at mid-height of wall.

C. Ventilation: Provide continuous ventilation as required to rid the spaces in which the wall coverings are being installed of volatile compounds given off by the wall coverings, sealers and adhesives and as recommended by the product manufacturer for full drying or curing.

D. Protect other surfaces from damage resulting from installation of wall coverings. Provide drop cloths, shields and protective equipment to prevent primers, adhesives or wall covering from fouling adjacent surfaces and in particular, storage and preparation areas.

E. Store flammable rubbish, waste, cloths and materials which may constitute a fire hazard, in closed metal containers. Daily remove and properly dispose of flammable wastes from the site.

3.2 SURFACE CONDITION AND PREPARATION:

A. Inspect surfaces to receive wall coverings to assure that:

1. Patches and repairs to substrates are completed.
2. Surfaces are clean, smooth and prime painted.
3. Masonry and concrete walls are to have flush joints. Coat these walls with cement plaster or wall/liner as substrate preparation.

B. Surfaces to receive wall covering are to be dry. Test moisture content of plaster, concrete, and masonry walls with an electric moisture meter. The moisture content is not permitted to be more than 5 percent. Submit test results.

- C. Do not proceed until discovered defects have been corrected by other trades and surfaces are ready to receive wall covering.
- D. Carefully remove electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings and fastenings, prior to starting work and store items for reinstallation.

3.3 APPLICATION OF ADHESIVE:

- A. Mix and apply adhesives in accordance with manufacturer's directions.
- B. Prevent adhesive from getting on face of wall covering.
- C. Apply adhesive to wall covering back.

3.4 INSTALLATION:

- A. Use wall covering of same batch or run in each area. Use fabric rolls in consecutive numerical sequence of manufacture.
- B. Install material completely adhered, smooth, clean, without wrinkles, air pockets, gaps or overlaps.
- C. Extend wall covering continuous behind non-built-in casework and other items which are not bolted to the walls.
- D. Install wall covering before installation of resilient base. Extend wall covering not more than 6 mm (1/4 inch) below top of resilient base.
- E. Install wall covering panels consecutively in order in which they are cut from the roll including filling spaces above or below windows, doors, or similar penetrations.
- F. Do not install horizontal seams.
- G. Except on match patterns, hang fabric by reversing alternate strips, except as recommended by the manufacturer.
- H. Cutting:
 - 1. Cut on a work table with a straight edge.
 - 2. Joints or seams that are not cut clean are unacceptable.
 - 3. Trim additional selvage to achieve a color and pattern match at seams. Overlapped seams are not allowed.
 - 4. Do not double cut seams on wall unless specified.
 - 5. If double cutting on the wall is necessary, place a three inch strip of Type I wall covering under pasted edge.
 - a. Do not cut into wall surface.
 - b. After cutting, remove strip and excess adhesive from seam before proceeding to next seam.
 - c. Smooth down seam in adhesive for tight bond and joint.

I. Trim strip-matched patterns which are not factory pre-trimmed.

J. Inside Corners:

1. Wrap wall covering around corners.
2. Do not seam within 50 mm (2 inches) of inside corners.
3. Double cut seams.

K. Outside Corners:

1. Wrap wall covering around corners.
2. Do not seam within 152 mm (6 inches) of outside corners.
3. Double cut seams.

3.5 PATCHING:

A. Replace surface damaged wall covering in a space as specified for new work:

1. Replace full height of surface.
2. Replace from break in plane to break in plane when same batch or run is not used.
3. Double cut seams.
4. Adjoining differential colors from separate batches or runs is not acceptable.

B. Correct loose or raised seams with adhesives to lay flat with tight bonded joint as specified for new work.

3.6 CLEANING AND INSTALLING TEMPORARY REMOVED ITEMS:

- A. Remove adhesive from wall covering as work proceeds.
- B. Remove adhesives where spilled, splashed or splattered on wall coverings or adjacent surfaces in a manner not to damage surface from which it is removed.
- C. Upon completion of work, leave wall covering free of dirt or soil.
- D. Remove all debris associated with wall covering installation.
- E. Reinstall previously removed electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings and fastenings.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior and exterior painting, including surface preparation.

1.2 RELATED SECTIONS

- A. Section 06 20 00 - Finish Carpentry.
- B. Section 09 29 00 - Gypsum Board.

1.3 REFERENCES

- A. Green Seal Standard GS-11; May 20, 1993.
- B. US Green Building Council, (USGBC) - Green Seal standards for LEED paint credits.
- C. Occupational Safety and Health Act (OSHA) - Safety Standards.
- D. American National Standards Institute (ANSI) - Performance Standards.
- E. Paint Decorating Contractors of America (PDCA) - Application Standard.
- F. National Paint and Coatings Association (NPCA) - Gloss Standard.
- G. American Society for Testing Materials (ASTM) - Testing Methods.
- H. Master Paint Institute (MPI #) - Established paint categories and standards.
- I. SSPC (PM1) - Steel Structures Painting Manual, Vol. 1, Good Painting Practice; Society for Protective Coatings; 1993, Third Edition.
- J. SSPC (PM2) - Steel Structures Painting Manual, Vol. 2, Systems and Specifications; Society for Protective Coatings; 1995, Seventh Edition.
- K. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

1.4 DEFINITIONS

- A. Commercial as used in this Section refers to a product well suited for a commercial application.
- B. DFT as used in this Section refers to the Dry Film Thickness of the coating.
- C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.
- D. DTM as used in this Section refers to paint that is applied Direct To Metal.
- E. LEED as used in this Section refers to Leadership in Energy and Environmental Design. Products listed meet LEED criteria for environmentally safe interior primers, paints and coatings.

- F. OTC as used in this Section refers to the Ozone Transmission Commission. OTC has established the following VOC levels for the Northeastern United States. Products shall meet the following OTC limits for VOC's.
 - 1. Interior flat paints: 100 grams per liter or less, per gallon.
 - 2. Interior enamels: 150 grams per liter or less, per gallon.
 - 3. Interior stains: 250 grams per liter or less, per gallon.
 - 4. Interior primers: 200 grams per liter or less, per gallon.
 - 5. Rust preventive coatings: 400 grams per liter or less, per gallon.
 - 6. Dry fog coatings: 400 grams per liter or less, per gallon.
 - 7. Floor coatings: 250 grams per liter or less, per gallon.
- G. Premium as used in this Section refers to the best quality product "top of the line".
- H. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains. The level of VOCs appears after each product listed in the Schedule in grams per liter (g/L).
- I. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of our products. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.
 - 1. Flat - Less than 5 Percent.
 - 2. Eggshell - 5 - 20 Percent.
 - 3. Satin - 20 - 35 Percent.
 - 4. Semi-Gloss - 30 - 65 Percent.
 - 5. Gloss - Over 65 Percent.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide a complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - 2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.
- C. Samples: Submit three paper samples, 5 inches by 7 inches (127mm x 178mm) in size, illustrating selected colors for each color and system selected with specified coats cascaded.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.

- E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of [10] years experience.
- B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Mock-up areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Approved mock-up areas will serve as the standard for remaining Work.
 - 4. Refinish mock-up area as required to produce acceptable Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Disposal:
 - 1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
 - 2. Do not incinerate closed containers.
 - 3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

1.8 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 recommended limits.

1.9 WARRANTY

- A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.
- B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

1.10 EXTRA MATERIALS

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Benjamin Moore & Co., which is located at: 101 Paragon Dr.; Montvale, NJ 07645; Toll Free Tel: 855-724-6802; Email: request info (info@benjaminmoore.com); Web:www.benjaminmoore.com/en-us/for-architects-and-designers|www.benjaminmoore.ca
- B. Requests for substitutions will be considered in accordance with provisions of Section 012500.

2.2 MATERIALS - GENERAL

- A. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D-National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- B. Compatibility: Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.3 MIXING AND TINTING

- A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.
- C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

2.4 INTERIOR PAINT SYSTEMS

- A. METAL: HM doors and frames
 - 1. Semi-Gloss Finish Waterborne Alkyd:
 - a. Flat Finish:

- 1) 1st Coat: Benjamin Moore Super Spec HP Acrylic Metal Primer P04 (47 g/L), MPI # 107, X-Green 107, 134.
- 2) 2nd Coat: Benjamin Moore Advance Waterborne Interior Alkyd SemiGloss 793 (48 g/L).
- 3) 3rd Coat: Benjamin Moore Advance Waterborne Interior Alkyd SemiGloss 793 (48 g/L).

B. WOOD - (Trim):

1. Latex Systems:

a. Flat Finish:

- 1) 1st Coat: Benjamin Moore Fresh Start Multi-Purpose Primer N023 (44 g/L), MPI # 6, 17, X-Green 17, 39, 137, X-Green 137.
- 2) 2nd Coat: Benjamin Moore Ultra Spec 500 Interior Latex Flat N536 (0 g/L), MPI # 53, X-Green 53, 143, X-Green 143.
- 3) 3rd Coat: Benjamin Moore Ultra Spec 500 Interior Latex Flat N536 (0 g/L), MPI # 53, X-Green 53, 143, X-Green 143.

b. Semi-Gloss Finish:

- 1) 1st Coat: Benjamin Moore Fresh Start Multi-Purpose Primer N023 (44 g/L), MPI # 6, 17, X-Green 17, 39, 137, X-Green 137.
- 2) 2nd Coat: Coronado Rust Scat Waterborne Acrylic Semi-Gloss 90 (134 g/L), MPI # 153.
- 3) 3rd Coat: Coronado Rust Scat Waterborne Acrylic Semi-Gloss 90 (134 g/L), MPI # 153.

2. Stain and Varnish System:

a. Satin Finish:

- 1) 1st Coat: Lenmar Waterborne Interior Wiping Stain 1WB.1300 (240 g/L), MPI # 186.
- 2) 2nd Coat: Lenmar Waterborne Aqua-Plastic Urethane Satin, 1WB.1427 (335 g/L), MPI # 121, 128.
- 3) 3rd Coat: Lenmar Waterborne Aqua-Plastic Urethane Satin, 1WB.1427 (335 g/L), MPI # 121, 128.

C. DRYWALL - (Walls, Ceilings, Gypsum Board and similar items)

1. Latex Systems:

a. Eggshell / Satin System:

- 1) 1st Coat: Benjamin Moore Fresh Start Multi-Purpose Primer N023 (44 g/L), MPI # 6, 17, X-Green 17, 39, 137, X-Green 137, LEED Credit, CHPS Certified.

2) 2nd Coat: Benjamin Moore Ultra Spec 500 Latex Eggshell N538 (0 g/L), MPI # 52, X-Green 52, 145, X-Green 145, 139, X-Green 139, LEED 2009 LEED V4, CHPS Certified.

3) 3rd Coat: Benjamin Moore Ultra Spec 500 Latex Eggshell N538 (0 g/L), MPI # 52, X-Green 52, 145, X-Green 145, 139, X-Green 139, LEED 2009, LEED V4, CHPS Certified.

b. Flat System:

1) 1st Coat: Benjamin Moore Fresh Start Multi-Purpose Primer N023 (44 g/L), MPI # 6, 17, X-Green 17, 39, 137, X-Green 137, LEED Credit, CHPS Certified.

2) 2nd Coat: Benjamin Moore Ultra Spec 500 Interior Latex Flat N536 (0 g/L), MPI # 53, X-Green 53, 143, X-Green 143, LEED 2009, LEED V4, CHPS Certified.

3) 3rd Coat: Benjamin Moore Ultra Spec 500 Interior Latex Flat N536 (0 g/L), MPI # 53, X-Green 53, 143, X-Green 143, LEED 2009, LEED V4, CHPS Certified.

PART 3 EXECUTION

3.1 EXAMINATION

- A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.
- B. The Contractor shall review product health and safety precautions listed by the manufacturer.
- C. The Contractor shall be responsible for enforcing on site health and safety requirements associated with the Work.
- D. Do not begin installation until substrates have been properly prepared.
- E. Ensure that surfaces to receive paint are dry immediately prior to application.
- F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer. Where exceeding the following values, promptly notify Architect and obtain direction before beginning work.
 - 1. Concrete and Masonry: 3-5 percent. Allow new concrete to cure a minimum of 28 days.
 - 3. Interior Wood: 15 percent.
 - 4. Interior Finish Detail Woodwork, Including Trim, and Casework: 10 percent.
 - 5. Plaster and Gypsum: 15 percent.
 - 6. Concrete Slab-On-Grade: Perform calcium chloride test over 24 hour period or other acceptable test to manufacturer. Verify acceptable moisture transmission and pH levels.
- G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose

primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.

- H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.2 PREPARATION - GENERAL

- A. Clean surfaces thoroughly prior to coating application.
- B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
- C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.
- D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.
- E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
- F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.
- G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.
- H. Protect adjacent surfaces not indicated to receive coatings.
- I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

3.3 SURFACE PREPARATION

- A. Concrete and Concrete Masonry: Clean surfaces free of loose particles, sand, efflorescence, laitance, form oil, curing compounds, and other substances which could impair coating performance or appearance.
- B. Existing Coatings:
 - 1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
 - 2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.
- C. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.

- D. Masonry Surfaces - Restored: Remove loose particles, sand, efflorescence, laitance, cleaning compounds and other substances that could impair coating performance or appearance.
- E. Metals - Aluminum, Mill-Finish: Clean and etch surfaces with a phosphoric acid-water solution or water based industrial cleaner. Flush with clean water and allow to dry, before applying primer coat.
- F. Metals - Ferrous, Unprimed: Remove rust or scale, if present, by wire brush cleaning, power tool cleaning, or sandblast cleaning; remove grease, oil, and other contaminants which could impair coating performance or appearance by solvent cleaning, with phosphoric-acid solution cleaning of welds, bolts and nuts; spot-prime repaired welds with specified primer.
- G. Metals - Ferrous, Shop-Primed: Remove loose primer and rust, if present, by scraping and sanding, feathering edges of cleaned areas to produce uniform flat surface; solvent-clean surfaces and spot-prime bare metal with specified primer, feathering edges to produce uniform flat surface.
- H. Metals - Galvanized Steel (not passivated): Clean with a water-based industrial strength cleaner, apply an adhesion promoter followed by a clean water rinse. Alternately, wipe down surfaces using clean, lint-free cloths saturated with xylene or lacquer thinner; followed by wiping the surface dry using clean, lint-free cloths.
- I. Metals - Galvanized Steel, Passivated: Clean with water-based industrial strength cleaner. After the surface has been prepared, apply recommended primer to a small area. Allow primer to cure for 7 days, and test adhesion using the "cross-hatch adhesion tape test" method in accordance with ASTM D 3359. If the adhesion of the primer is positive, proceed with a recommended coating system for galvanized metal.
- J. Polyvinyl Chloride (PVC) Pipe: remove contaminants and markings with denatured alcohol scuff sand and wipe with solvent for maximum adhesion. Test adhesion before starting the job.
- K. Wood:
 - 1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer; fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
 - 2. Remove mill marks and ink stamped grade marks.
 - 3. Apply primer coat to back of wood trim and paneling.
- L. Wood Doors: Seal door tops and bottoms prior to finishing.
- M. Wood Doors - Field-Glazed Frames and Sash: Prime or seal glazing channels prior to glazing.

3.4 APPLICATION - GENERAL

- A. Application of primers, paints, stains or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.

- B. Apply each coat to uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
- D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5 feet (1.5 m).
- E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
- F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
- G. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.
- H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.

3.5 CLEANING

- A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this section progress; do not allow to dry.
- B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.
- C. Reconnect equipment adjacent to surfaces indicated to receive coatings.
- D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.
- E. Remove protective materials.

3.6 PROTECTION AND REPAIR

- A. Protect completed coating applications from damage by subsequent construction activities.
- B. Repair to Architect's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Architect's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

END OF SECTION

[THIS PAGE LEFT INTENTIONALLY BLANK]

SECTION 10 28 13

TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet accessories.
2. Framed mirrors.

B. Related Sections:

1. Division 01: General Requirements; Administrative, procedural, and temporary work requirements.
2. Section 08 80 00 – Glazing

1.2 REFERENCES

A. ASTM International (ASTM):

1. A123/A123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
2. A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
3. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
4. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
5. B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
6. C1036 - Standard Specification for Flat Glass.

B. Underwriters Laboratories, Inc. - Listed Products.

1.3 SUBMITTALS

A. Submittals for Review:

1. Product Data:
 - a. Schedule accessories by room; show plans and elevations, and identify room name and number, type and quantity of accessories, and mounting heights.
 - b. Include manufacturer's brochures showing sizes, details of function, finishes, and attachment methods.
2. Warranty: Sample warranty form.

1.4 QUALITY ASSURANCE

- A. Conform to applicable accessibility code for locating accessories.

1.5 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against mirror silver spoilage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Bobrick Washroom Equipment, Inc. (www.bobrick.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Stainless Steel:
 - 1. Sheet: ASTM A666, Type 304, rollable temper.
 - 2. Tubing: ASTM A269.
- B. Galvanized Steel:
 - 1. ASTM A1008/1008M.
- C. Mirror Glass: ASTM C1036, Type I, Class 1, Quality q1, 1/4 inch thick.

2.3 ACCESSORIES

- A. Fasteners: Stainless steel where exposed, hot dip galvanized where concealed; type best suited to substrate conditions.
- B. Mirror Adhesive: Adhesive setting compound, produced specifically for setting mirrors by spot application method.

2.4 FABRICATION

- A. Use stainless steel for exposed surfaces; galvanized steel may be used in concealed locations.
- B. Form exposed surfaces from single sheet of stock, free from joints, and flat, without distortion.
- C. Weld joints of fabricated components and grind smooth.
- D. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges.
- E. Fabricate soap dispensers to operate with less than 5 pound force.
- F. Provide hangers, adapters, anchor plates, and accessories required for installation.
- G. Key locks alike; furnish six keys.
- H. Mirrors:

1. Frame: One piece, roll formed stainless steel channel, 1/2 x 1/2 inch, with corners mitered and welded.
2. Mirror: Apply one coat of silver, one coat of electroplated copper, and one coat of organic mirror backing compound to back surface of glass.
3. Backing: Galvanized steel sheet.
4. Isolate glass from frame and backing with resilient, waterproof padding.
- I. Shop assemble units and package complete with anchors and fittings.

2.5 FINISHES

- A. Stainless Steel: No. 4 satin.
- B. Galvanizing: ASTM A123/A123M to 1.25 ounces per square foot.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set plumb, level, square, and rigid.

3.2 MIRROR INSTALLATION

- A. Support large mirrors on concealed hanger brackets. Anchor rigidly to wall construction.
- B. Place plumb and level without distortion.

3.3 SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL NO.
A	Toilet Tissue Dispenser	Bobrick	B-2888
B	Grab Bars	Bobrick	B-6806 series
C	Mirror	Bobrick	B-165 1830

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This Work shall consist of excavation, disposal of excess material, shaping, and compaction of all material encountered within the limits of Work, including excavation and fill for the elevator shaft and pit. The excavation shall include, but is not limited to, the native soils which shall be excavated for the Project Work. All Work shall be completed in accordance with these Specifications, the lines and grades, and typical cross-section shown on the Drawings.
- B. All excavation shall be classified, "unclassified excavation," or "muck excavation" or "rock excavation," as hereafter described.

1.2 RELATED SECTIONS

- A. Division 01: General Requirement; Administrative, procedural, and temporary work requirements.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
 - 2. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.4 DEFINITIONS

- A. Muck Excavation: shall consist of the removal of mixtures of soils and organic matter not suitable for foundation material and replacement with approved material.
- B. Rock Excavation: shall consist of igneous, metamorphic and sedimentary rock which cannot be excavated without the use of rippers, and all boulders or other detached stones each having a volume of one-half (1/2) cubic yard or more, as determined by physical or visual measurement. It shall also include replacement with approved materials as required.
- C. Unclassified Excavation: shall consist of the excavation of all materials of whatever character required of the Work, obtained within the Project limits.

1.5 QUALITY ASSURANCE

- A. Final cross-sections shall be surveyed of areas that are to finished grade and compared to the design section for accuracy.
- B. Final grade shall match design grades within the tolerance discussed in PART 3 EXECUTION.

PART 2 PRODUCTS**2.1 MATERIALS**

- A. Suitable material identified onsite shall be used first for backfill.
- B. Excess excavated native soils which are not used as backfill shall become the property of Contractor and shall be disposed of offsite by Contractor.
- C. Muck Excavation shall also include the replacement of excavated much with uniformly graded rock, riprap, onsite or imported soils, or other material, whichever is most suitable for the specific situation encountered.

PART 3 EXECUTION**3.1 GENERAL EXCAVATION**

- A. General:
 - 1. The excavation shall be finished to reasonably smooth and uniform surfaces.
 - 2. Excavation operations shall be conducted so that material outside of the limits will not be disturbed.
- B. Excavation:
 - 1. Unclassified:
 - a. All excess suitable material excavated from the Project site and not used shall be removed from the Project site and become property of Contractor.
 - b. Where material encountered within the limits of the Work is considered unsuitable, shall be excavated and replaced with suitable fill material.
 - c. Debris is defined as "anything that is not earth which exists at the job site."
 - 2. Muck:
 - a. Where excavation to the finished grade section results in unsuitable soil, Contractor to remove the unsuitable materials and backfill to the finished graded section with suitable material.
 - b. Disposal of the unsuitable material and replacement with suitable material shall be at Contractor's expense.
 - 3. Rock:
 - a. Unless otherwise specified, rock shall be excavated to a minimum depth of 0.5 foot below subgrade within the limits of the channel area, and the excavation shall be backfilled with suitable materials.
 - b. Disposal of material and replacement with suitable approved material shall be at Contractor's expense.

3.2 EXCAVATION AND BACKFILL FOR STRUCTURES

- A. Poor foundation material for any of the Work shall be removed, by Contractor.

1. Contractor will be compensated for removal and replacement of such materials in accordance with Muck Excavation.
- B. Contractor shall remove and replace at Contractor's expense any foundation materials which are:
 1. Disturbed by Contractor's Work or caused to become unacceptable for foundation material purposes by means of Contractor's equipment, manpower, or methods of Work.
- C. Care shall be taken when excavating the foundations to avoid disturbing the supporting materials. Excavation by either hand or careful backhoe soil removal, may be required in excavating the last few inches of material to obtain the subgrade of any item of the concrete Work.
- D. Impervious structural backfill shall be placed in six-inch (6") loose lifts within a range of two percent (2%) above to two percent (2%) below optimum moisture content and compacted to ninety-five percent (95%) of Maximum Standard Proctor Density for cohesive soils as determined by ASTM D698.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 31 40 00

UNDERPINNING

PART 1 GENERAL

1.1 SUMMARY

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.
2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:

1. Design of bracing, shoring, and underpinning.
2. Selection of construction sequence.
3. Temporary bracing of the structure or portions of the structure as required to prevent the structure from becoming unsafe during construction.
4. Temporary shoring of portions of the structure as required to prevent the structure from becoming unsafe during construction.
5. Temporary shoring of excavations.
6. Construction and removal of posts, timbers, lagging, braces, etc. required in connection with bracing, shoring, and underpinning the structure during construction.
7. Excavation, concrete placement and backfilling required in connection with underpinning foundations.

C. Related Sections:

1. Division 01 Section "General Requirements."
2. Division 01 Section "Special Procedures."
3. Division 03 Section "Cast-in-Place Concrete."
4. Division 31 Section "Excavation".
5. Division 31 Section "Trenching".

1.2 REFERENCES

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.

1.3 DESIGN REQUIREMENTS

- A. General: The stability and integrity of the structure during construction shall be maintained at levels generally acceptable within the construction industry by the use of bracing, shoring, and underpinning. In no case shall the structure be allowed to become unsafe during construction as defined by the local governing jurisdiction. Design stresses in bracing, shoring, and underpinning shall not exceed the allowable stresses in Section 51-1.06A (2) of the Standard Specifications.
- B. Bracing and Shoring for Structures:
 - 1. The bracing and shoring systems required to provide temporary support of a structure or portions of a structure during construction shall be designed to support the dead, live, soil, earthquake and wind loads that may be imposed on the structure during construction in accordance with industry standards and generally accepted engineering principles.
 - 2. The proposed bracing and shoring systems shall have foundations designed for allowable soil bearing pressures in accordance with the geotechnical investigation prepared for the Project.
- C. Shoring of Excavations and Underpinning: The proposed shoring and underpinning systems shall be designed for earth pressures and allowable soil bearing values as applicable in accordance with the geotechnical investigation prepared for the Project.

1.4 SUBMITTALS

- A. Submit under provisions of Division 01 Section "General Requirements."
- B. Shop Drawings indicating layout, member sizes, connection details and construction sequence for bracing, shoring and underpinning. No work related to bracing, shoring or underpinning shall take place until the University has reviewed the Shop Drawings.
- C. Design calculations of bracing, shoring and underpinning showing member stresses and connections due to imposed loads.

1.5 QUALITY ASSURANCE

- A. Design calculations and Shop Drawings of proposed bracing, shoring, and underpinning of the structure shall be prepared, stamped, and signed by a Structural Engineer registered in the State of Michigan.

1.6 PROJECT CONDITIONS

1.7 WARRANTY

PART 2 PRODUCTS

2.1 MATERIALS FOR SHORING AND BRACING

- A. Materials for shoring and bracing shall be undamaged, high quality materials.

2.2 CONCRETE FOR UNDERPINNING

- A. Concrete for underpinning shall meet the requirements of Division 03 Section "Cast in Place Concrete".

PART 3 EXECUTION**3.1 CONSTRUCTION**

- A. Construction of bracing, shoring and underpinning shall be in accordance with the reviewed Shop Drawings prepared by the Subcontractor's Engineer.
- B. The Subcontractor shall hire the Engineer responsible for the design of bracing, shoring and underpinning and inspection of the work as detailed on the bracing, shoring, and underpinning Shop Drawings, prior to sawcutting or removing portions of the structure.
- C. Excavations for underpinning the foundations shall be inspected by the Geotechnical Engineer prior to placement of concrete.
- D. The Engineer responsible for design of bracing, shoring, and underpinning shall write a letter to the University certifying that construction of bracing, shoring, and underpinning was completed in accordance with the bracing, shoring, and underpinning Shop Drawings and meets its approval, prior to placement of concrete, sawcutting, and removal or modification of portions of the structure.
- E. Remove surplus excavated materials from site.

3.2 REMOVAL OF BRACING AND SHORING

- A. Bracing and shoring shall not be removed until the new members have acquired sufficient strength to support their weight and the loads superimposed thereon safely. In no case may bracing or shoring be removed until the time and sequence has been approved by the Engineer responsible for bracing and shoring and reviewed by the University.
- B. In general, bracing and shoring of concrete shall remain in place for at least ten days, when they may be removed provided the concrete is sufficiently hard and will not be injured.

END OF SECTION

[THIS PAGE INTENTIONALLY LEFT BLANK]

SECTION 34 71 13

VEHICLE BARRIERS

PLASTIC SECURITY POST COVERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Accessories
 - 2. Plastic bollard covers.

1.2 REFERENCE STANDARDS

- A. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

1.3 SUBMITTALS

- A. Comply with Section 01 33 00 – Submittal Procedures.
- B. Product Data: Provide for each type of bollard, component, finish, and accessory specified.
- C. Color Samples: Submit sample of color specified.
- D. Setting Drawings: For steel security posts, show foundations and cutouts required in work specified in other Sections.
- E. Maintenance Data: Submit manufacturer's field touch-up, cleaning, and maintenance instructions.
- F. Warranty Documentation: Submit sample of manufacturer's warranty.

1.4 QUALITY ASSURANCE

- A. Comply with Section 01 40 00 – Quality Requirements

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with Section 01 60 00 – Product Requirements.
- B. Protect bollards and accessories during delivery, storage, and handling.

1.6 WARRANTY

- A. Comply with Section [01 78 36 – Warranties.]
- B. Provide manufacturer's standard warranty against defects in materials and workmanship.
 - 1. Warranty Period: Five years from date of invoice, except as otherwise indicated.
 - a. Plastic Bollards and Post Covers: One year.

PART 2 PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturer: Reliance Foundry Co. Ltd.
 - 1. Phone: 604-592-4333 or 888-735-5680
 - 2. Fax: 604-590-8875
 - 3. Website: <http://www.reliance-foundry.com/bollard/post-covers-plastic>
 - 4. Email: info@reliance-foundry.com
- B. Substitutions: Comply with provisions of Section 01 25 00 – Substitution Procedures

2.2 ACCESSORIES:

- A. Self-adhesive foam strips.
- B. Self-adhesive neoprene tape.
- C. Reflective Tape: 2 strips of 3M Scotchlite Reflective Sheeting Series tape, recessed on bollard.
- D. Security Post:
 - 1. Pipe: ASTM 500 B Structural Grade Steel
 - 2. Manufacturer: Reliance Foundry Co. Ltd.
 - 3. Country of Origin: United States.
 - 4. Base Diameter: 4.5 inches
 - 5. Finish: Grey primer.
 - 6. Installation:
 - a. Direct embed.
 - b. Footing and fill; Concrete or mortar, [3000 psi minimum.]

2.3 PLASTIC BOLLARD COVERS

- A. Materials:
 - 1. Formolene HB5502B, High Density Polyethylene (HDPE); Hexene Copolymer for Blow Molding.
 - a. High molecular weight material. Designed for optimum balance of density, molecular weight and molecular weight distribution demonstrating maximum property advantages for large products that require high impact resistance.
 - b. Ultraviolet protection additive.
 - c. Anti Static Package: Combined in manufacturing process of HDPE.
 - d. Abrasion Resistant.
 - e. Environmental Stress Cracks Resistant.

- f. Flexural modulus: 200,000 psi.
 - g. Tensile Strength: 4,000 psi.
 - 2. Low-density thermoplastic polyethylene (LDPE).
- B. Country of Origin: China.
- C. Plastic Bollard Cover [Designer's Designation]:
 - 1. Model: Reliance Foundry; R-7100.
 - 2. Height: 52 inches (132 cm)
 - 3. Base Diameter: 5 inches (12.7 cm)
 - 4. Weight: 4 lbs. (1.8 kg)
 - 5. Maximum Interior Post Height: 51 inches (129.5 cm)
 - 6. Maximum Interior Post Diameter: 4.5 inches (11.4 cm)
 - 7. Material: High Density Polyethylene (HDPE)
Color: Yellow
 - 8. Tape Color: White
 - 9. Installation: Security post, self-adhesive foam strips.

2.4 DECORATIVE PLASTIC BOLLARD COVERS

- A. Plastic Bollard Cover [Designer's Designation]:
 - 1. Model: Reliance Foundry; R-7173.
 - 2. Design: Cylinder with banded top.
 - 3. Height: 52 inches (132 cm)
 - 4. Base Diameter: 7.5 inches (19 cm)
 - 5. Weight: 12 lbs. (5.4 kg)
 - 6. Maximum Interior Post Height: 50 inches (127 cm)
 - 7. Maximum Interior Post Diameter: 6.6 inches (16.8 cm)
 - 8. Color: Black
 - 9. Installation: Security post, self-adhesive neoprene tape.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine paving or other substrates for compliance with manufacturer's requirements for placement and location of embedded items, condition of substrate, and other conditions affecting installation of bollards.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's installation instructions and setting drawings.
- B. Do not install damaged, cracked, chipped, deformed or marred bollards. Field touch-up minor imperfections in accordance with manufacturer's instructions. Replace bollards that cannot be field repaired.
- C. Security Posts:
 - 1. Imbed with grout in formed or cored holes in concrete.
 - 2. Imbed in concrete footings.
- D. Plastic Bollard Covers: Install over foam strips in pattern indicated in manufacturer's instructions.
- E. Decorative Bollard Covers: Install over neoprene adhesive tape as indicated in manufacturer's instructions.

3.3 CLEANING & PROTECTION

- A. Protect bollards against damage.
- B. Immediately prior to Substantial Completion, clean bollards in accordance with manufacturer's instructions to remove dust, dirt, adhesives, and other foreign materials.
- C. Touch up damaged finishes according to manufacturer's instructions.

3.4 CLOSEOUT ACTIVITIES

- A. Provide executed warranty.

END OF SECTION

APPENDICES

APPENDIX A:

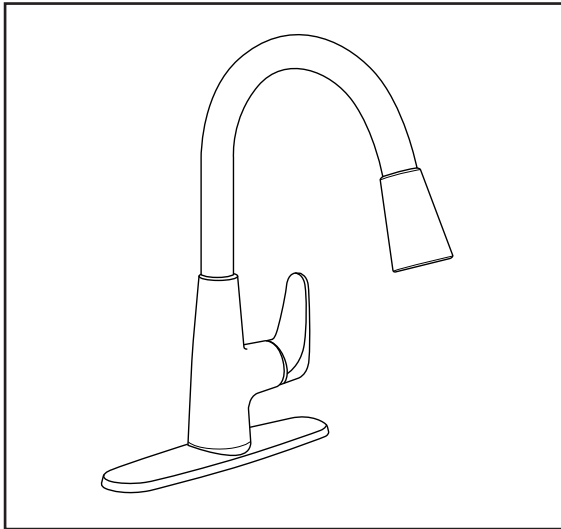
PRODUCT CUT SHEETS

Plumbing Fixtures

Flooring

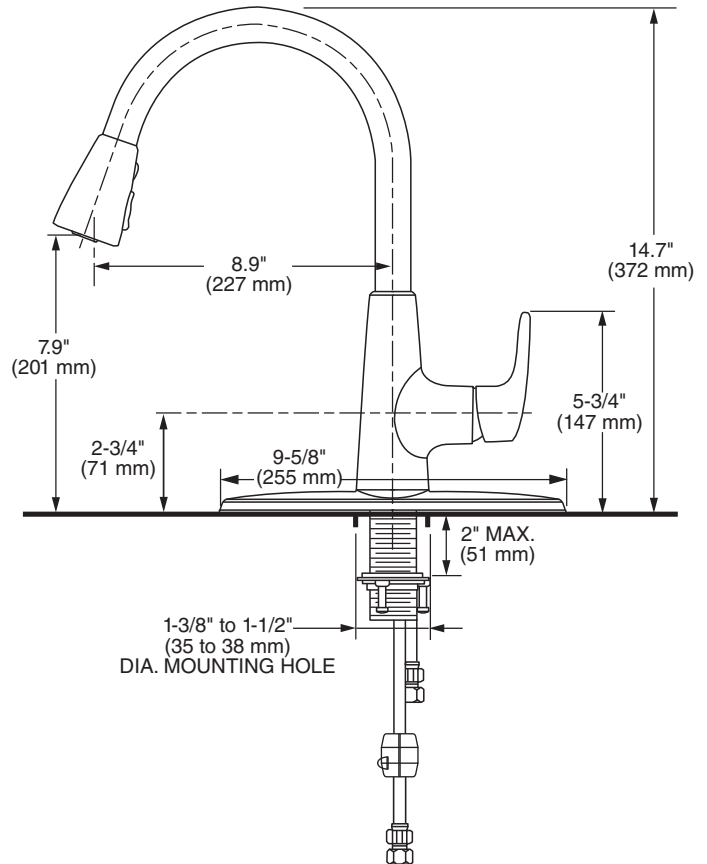
Light Fixtures

[THIS PAGE LEFT INTENTIONALLY BLANK]



MODEL NUMBER:

□ **7074.300 Pull-Down Faucet**



GENERAL DESCRIPTION:

Metal body and handle with brass swivel spout. Pull-down spray with adjustable spray pattern and pause feature. Nylon braided pull out hose complete with two integral check valves. Washerless 35 mm ceramic disc valve cartridge. 24" Flexible, color coded braided stainless steel supply hoses with 3/8" compression connections. Mounting shank with brass fixation ring. 1.5 gpm/5.7 L/min. maximum flow rate. Fitting can be mounted with or without metal escutcheon plate.

PRODUCT FEATURES:

Ceramic Disc Valve Cartridge: Assures a lifetime of smooth handle operation and drip-free performance.

Metal Construction: Quality materials for durability & long life.

Memory Position Valving: Allows user to turn valve on and off at preferred temperature setting without readjusting handle position each time.

Lead Free: Faucet contains $\leq 0.25\%$ total lead content by weighted average.

Pull-down Spray: Adjustable spray pattern-stream to spray and pause feature.

Integral Check Valves: Prevents back flow.

Choice of Finishes: Choice of Polished Chrome or Stainless Steel (PVD).

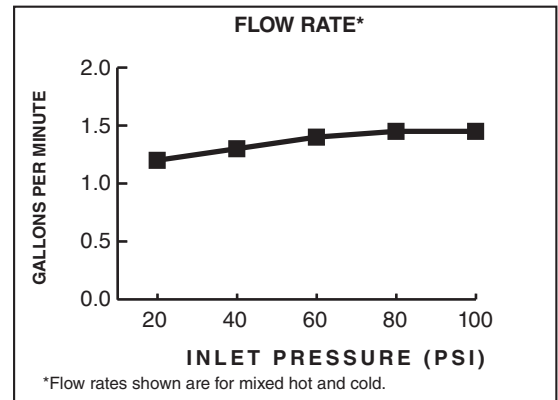
SUGGESTED SPECIFICATION

Single control kitchen faucet shall feature a metal body with pull-down spray. Shall also feature washerless ceramic disc valve cartridge, flexible stainless steel supply hoses and two integral check valves. Fitting shall be American Standard Model # 7074.300.____.

CODES AND STANDARDS

These products meet or exceed the following codes and standards:

ANSI A117.1
ASME A112.18.1
CSA B125.1
NSF 61/Section 9
NSF 372



1.5 gpm/5.7 L/min. FLOW RATE

Product Number	Description	Finish Options	
		Polished Chrome	PVD Stainless Steel
		002	075
7074.300	Pull-Down Kitchen Faucet		



Meets the American Disabilities Act Guidelines and **ANSI A117.1** Requirements for the physically challenged.

PRODUCT SPECIFICATIONS

Elkay Lustertone Stainless Steel 23-1/2" x 18-1/4" x 4-3/8", Single Bowl Undermount ADA Sink. Sink is manufactured from 18 gauge 304 Stainless Steel with a Lustertone finish, Rear Center drain placement, and Full spray sides and bottom.

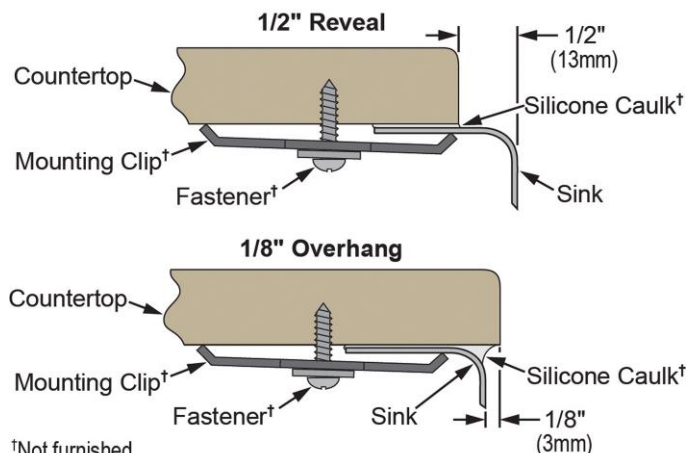
Installation Type:	Undermount
Material:	304 Stainless Steel
Finish:	Lustertone
Gauge:	18
Sound Deadening:	Full spray sides and bottom
Number of Bowls:	1
Sink Dimensions:	23-1/2" x 18-1/4" x 4-3/8"
Bowl 1 Dimensions:	21" x 15-3/4" x 4-3/8"
Drain Size:	3-1/2" (89mm)
Drain Location:	Rear Center
Minimum Cabinet Size:	27"
Mounting Hardware:	Undermount brackets sold separately
Template Included:	Yes
Cutout Template #:	1000001400

Template is available for download at [elkay.com](#)



This sink is compliant to ADA and ANSI/ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards.

Installation Profile:



†Not furnished

Designed to affix to the underside of any solid surface countertop.



AMERICAN PRIDE. A LIFETIME TRADITION.

Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



Sinks are listed by IAPMO[®] as meeting the applicable requirements of the Uniform Plumbing Code[®], International Plumbing Code[®], and National Plumbing Code of Canada.

Product Compliance: ADA & ICC A117.1
ASME A112.19.3/CSA B45.4
BUY AMERICAN ACT

[Clean and Care Manual \(PDF\)](#)

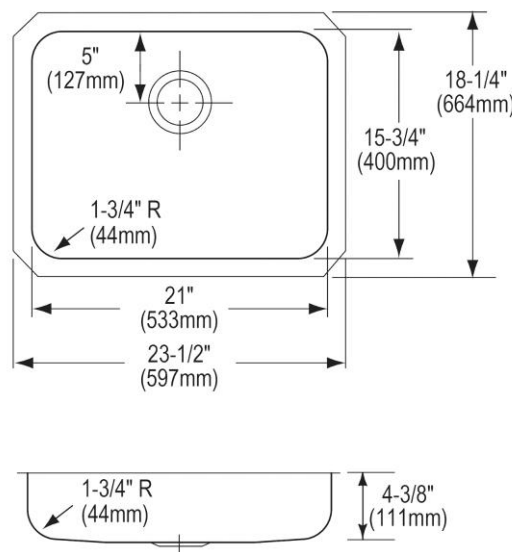
[Installation Instructions \(PDF\) - 1000002045](#)

[Installation Instructions \(PDF\) - 74180289 Disposer](#)

[Installation Instructions \(PDF\) - 74180340-USA Drain](#)

[Limited Lifetime Warranty \(PDF\)](#)

Similar models are available with: additional ADA depths, Perfect Drain



PART: _____ QTY: _____

PROJECT: _____

CONTACT: _____

DATE: _____

NOTES: _____

APPROVAL: _____

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit [elkay.com](#) for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

OPTIONAL ACCESSORIES

Bottom Grid:	LKWOBG2115SS
Cutting Board:	CB1516*
Drain:	LK99, LKAD35
Faucet:	LKGT1041, LKGT2041
Hardware:	LKUCLIP8
Rinsing Basket:	LKWRB2115SS, LKWERBSS
Sinkmate:	LKSMHSL
Soap Dispenser:	LKGT1054
* 1/2" sink reveal required for proper fit.	

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

LUCERNE™ WALL-HUNG LAVATORY

- Wall-hung sink
- Vitreous china
- Front overflow
- D-shaped bowl
- Self-draining deck area with contoured back and side splash shields
- Faucet ledge
- Compliant with Texas accessibility standard (TAS) for children age group 13 and up

Faucet holes on 203mm (8") centers (Illus.):

- ☐ **0356.028** For exposed bracket support
Shown with 4801.862 Amarilis Heritage faucet with Triune Cross handles (not included)
- ☐ **0356.015** For wall hanger (included) or concealed arms support
- ☐ **0356.915** For wall hanger (included) or concealed arms support
 - Less overflow

Faucet holes on 102mm (4") centers:

- ☐ **0355.027** For exposed bracket support
- ☐ **0355.012** For wall hanger (included) or concealed arms support
- ☐ **0355.912** For wall hanger (included) or concealed arms support
 - Less overflow

Single center faucet hole (Illus.):

- ☐ **0356.041** For exposed bracket support
Shown with 1340.000 metering faucet (not included)
- ☐ **0356.421** For wall hanger (included) or concealed arms support
- ☐ **0356.921** For wall hanger (included) or concealed arms support
 - Less overflow
- ☐ **0356.439** For wall hanger (included) or concealed arms support
 - Single faucet hole on right
- ☐ **0356.066** For exposed bracket support
 - Single faucet hole on right

Nominal Dimensions:

521 x 464mm
(20-1/2" x 18-1/4")

Bowl sizes:

381mm (15") wide
254mm (10") front to back
165mm (6-1/2") deep

Compliance Certifications -

Meets or Exceeds the Following Specifications:

- ASME A112.19.2 / CSA B45.1 for Vitreous China Fixtures



0356.028



0356.041

SEE FOLLOWING PAGES FOR ROUGHING-IN DIMENSIONS

To Be Specified:

- ☐ Color: ☐ White
- ☐ Faucet*:
- ☐ Faucet Finish:
- ☐ Supplies:
- ☐ 1-1/4" Trap:
- ☐ Nipple:
- ☐ Bracket Support (by others):
- ☐ Concealed Arms Support (by others):

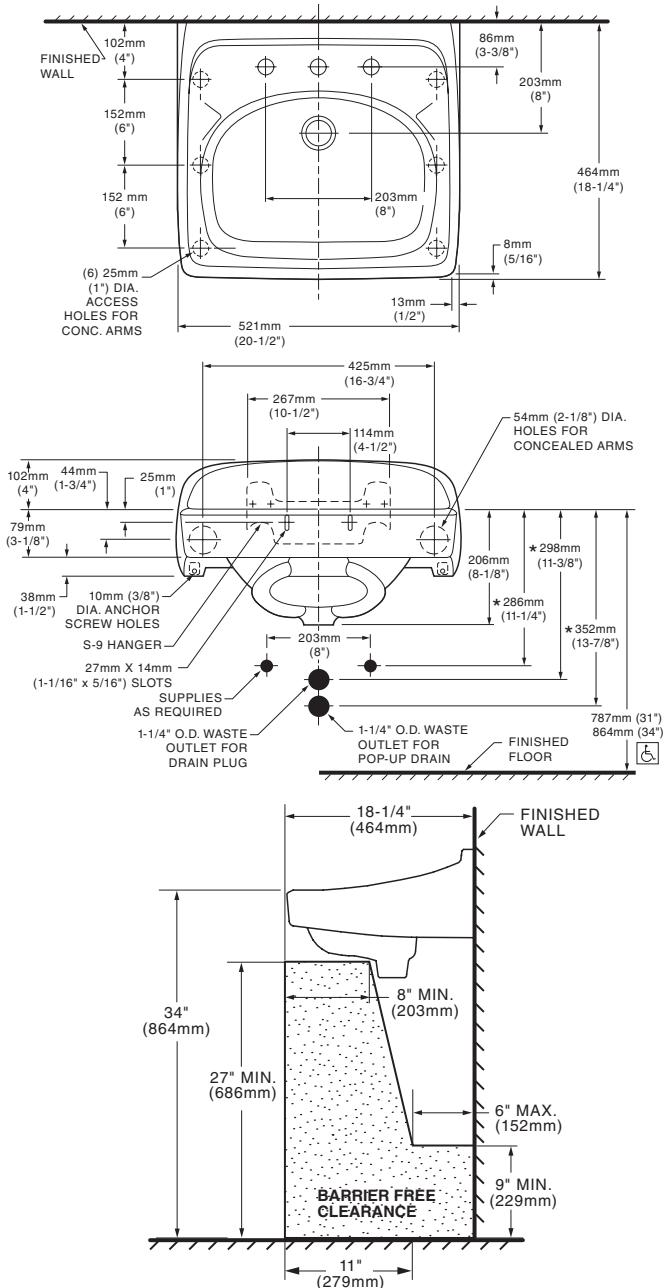
* See faucet section for additional models available



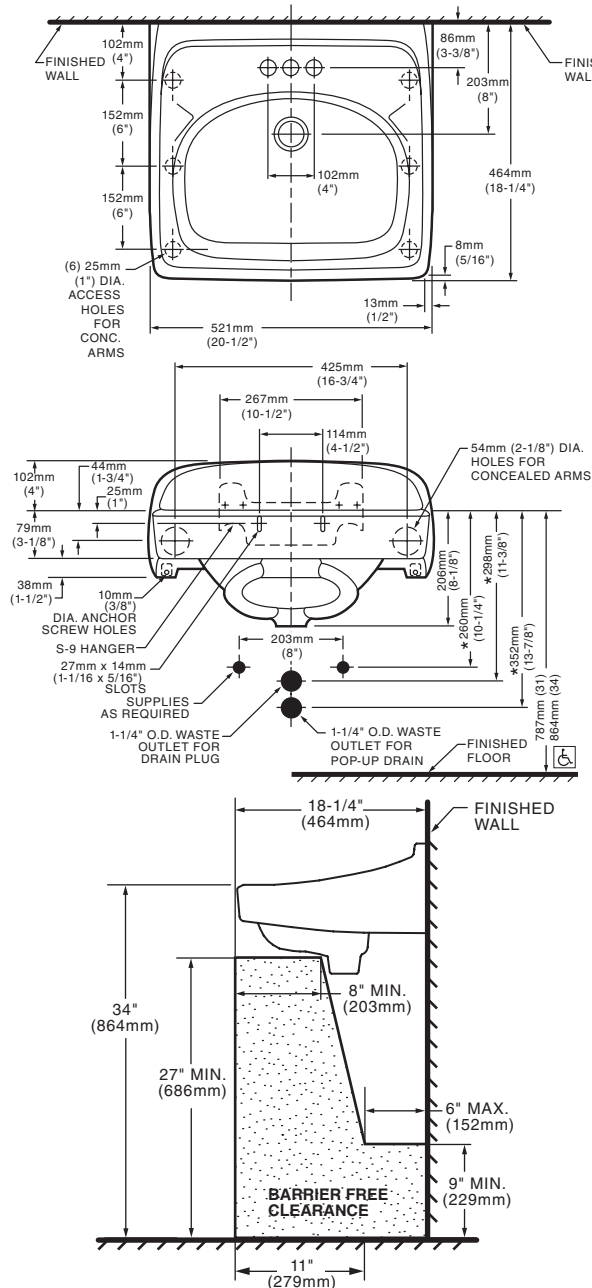
**MEETS THE AMERICANS WITH DISABILITIES ACT GUIDE-
LINES AND ANSI A117.1 ACCESSIBLE AND USABLE
BUILDINGS AND FACILITIES - CHECK LOCAL CODES.**

Top of front rim mounted 864mm (34") from finished floor.

- 0356.028** 8" CTRS FOR EXPOSED BRACKET SUPPORT
0356.015 8" CTRS FOR WALL HANGER
 OR CONCEALED ARMS
0356.915 LESS OVERFLOW



- 0355.027** 4" CTRS FOR EXPOSED BRACKET SUPPORT
0355.012 4" CTRS FOR WALL HANGER OR
 CONCEALED ARMS
0355.912 LESS OVERFLOW



NOTES:

* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
 PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
 FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
 CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

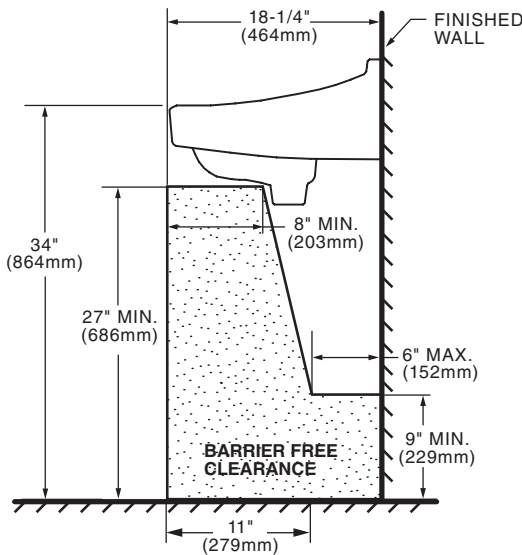
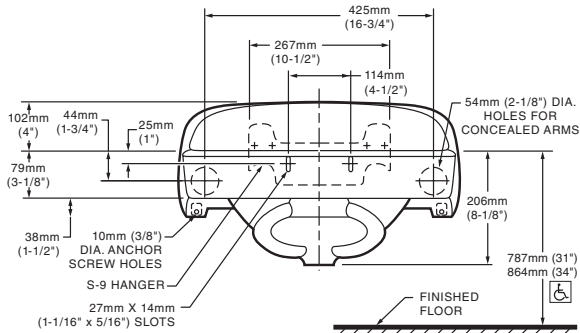
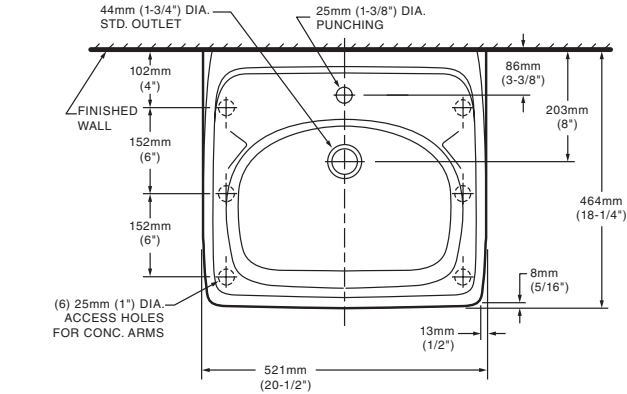


LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

0356.041 SINGLE CENTER HOLE FOR EXPOSED
BRACKET SUPPORT

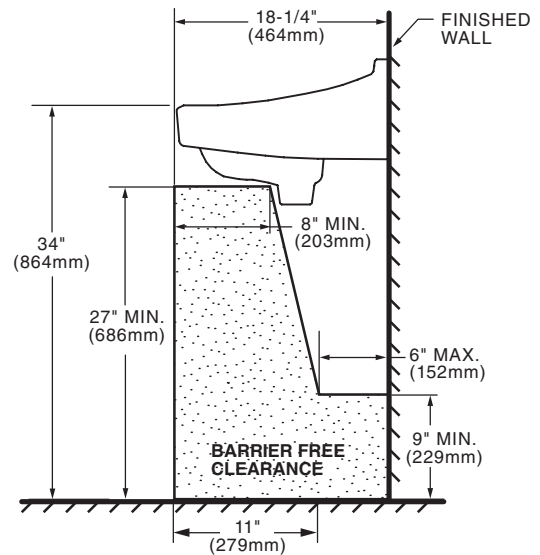
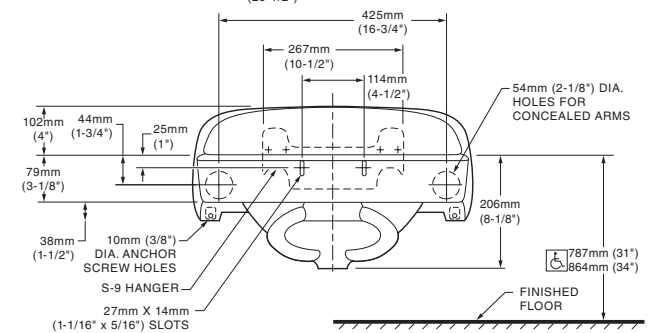
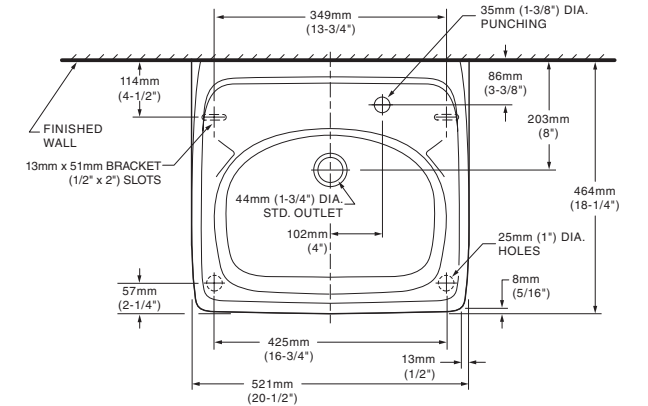
0356.421 SINGLE CENTER HOLE FOR WALL
HANGER OR CONCEALED ARMS

0356.921 LESS OVERFLOW



0356.439 SINGLE CENTER HOLE ON RIGHT FOR WALL
HANGER OR CONCEALED ARMS

0356.066 SINGLE CENTER HOLE ON RIGHT FOR
EXPOSED BRACKET SUPPORT



NOTES:

* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.



LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT
SET AT 864MM (34") ABOVE FINISHED FLOOR.

**COLONY® RIGHT HEIGHT® ELONGATED
12" ROUGH TOILET**

☐ **221AA.004**

- Vitreous china
- Low consumption (6.0 Lpf/1.6 gpf)
- PowerWash® rim scrubs bowl with each flush
- Includes color match bowl caps
- 2" flush valve
- 2" trapway
- 16-1/2" rim height for accessible applications
- 12" (305mm) rough-in
- Generous 9" x 8" water surface area
- Color matched trip lever is supplied
- 2 year warranty

☐ **3251A.101** Right Height® Elongated Bowl

☐ **4192A.004** Tank

Nominal Dimensions:

756 x 488 x 784mm
(29-3/4" x 19-3/16" x 30-7/8")

Fixture only, seat and supply sold separately

Alternative Tank Configurations Available:

- ☐ **4192A.064** Tank complete with tank cover locking device
- ☐ **4192A.005** Tank complete with trip lever located on right side

Compliance Certifications -

Meets or Exceeds the Following Specifications:

- ASME A112.19.2-2008/CSA B45.1-08 for Vitreous China Fixtures



NOTES:

THIS TOILET IS DESIGNED TO ROUGH-IN AT A MINIMUM DIMENSION OF 305MM (12") FROM FINISHED WALL TO C/L OF OUTLET. SUPPLY NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY. * DIMENSION SHOWN FOR LOCATION OF SUPPLY IS SUGGESTED.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.



MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 REQUIREMENTS FOR ACCESSIBLE AND USABLE BUILDING FACILITIES-CHECK LOCAL CODES.

To Be Specified:

- ☐ Color: ☐ White ☐ Bone ☐ Linen
- ☐ Seat: American Standard #5324.019 "Rise and Shine" solid plastic closed front elongated seat with cover
- ☐ Supply with stop:

Features

- Brass construction
- For single-hole installation
- One-piece, self-contained ceramic disc valve which allows both volume and temperature setting
- Temperature memory allows the faucet to be turned on and off at any temperature setting
- 4-3/8" (111 mm) spout reach
- Stationary spout
- No drain, no lift rod
- Flexible connections
- 0.5 gal/min (1.9 l/min) maximum flow rate [max at 80 psi (5.5bar)]



ADA

CSA B651

OBC

Codes/Standards

ASME A112.18.1/CSA B125.1

NSF/ANSI 61

NSF/ANSI 372

All applicable US Federal and State material regulations

DOE - Energy Policy Act 1992

California Energy Commission (CEC)

ADA

ICC/ANSI A117.1

CSA B651

OBC

KOHLER® Faucet Lifetime Limited Warranty

See website for detailed warranty information.

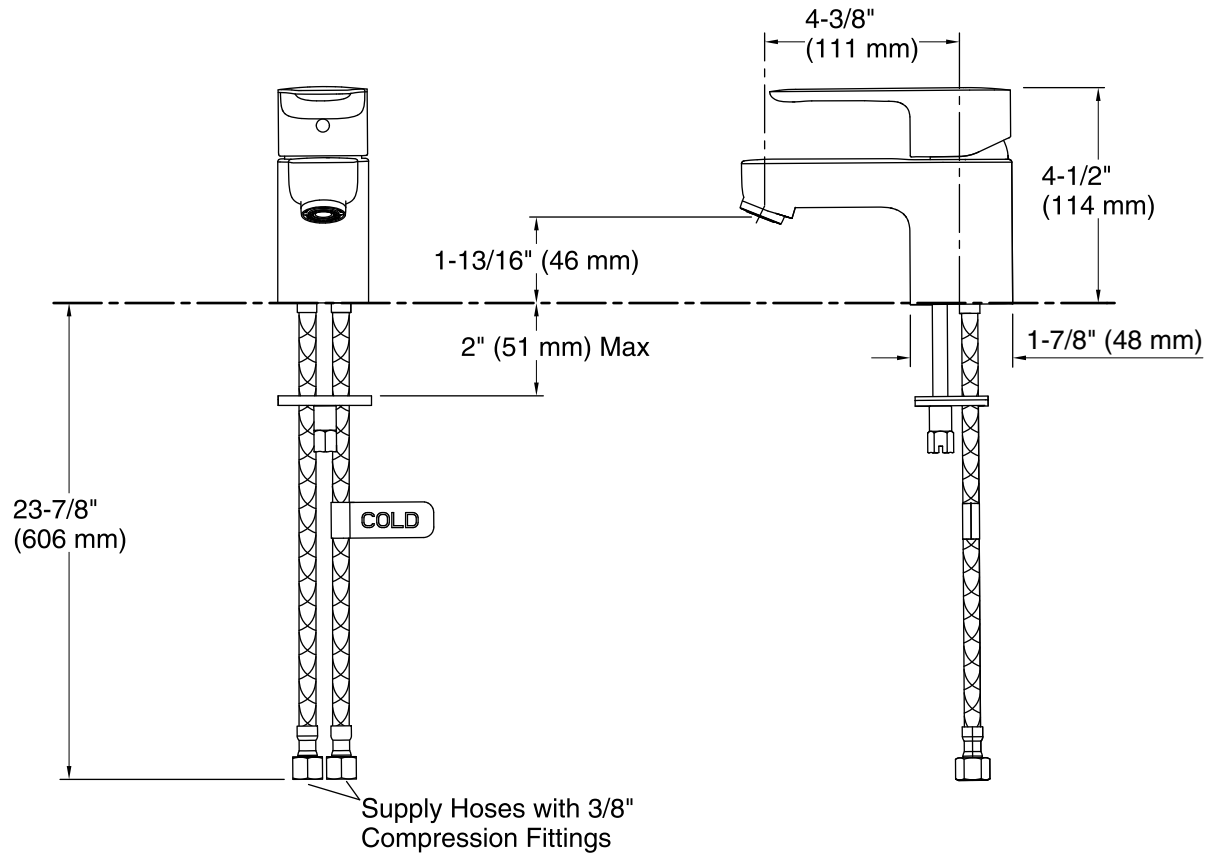
Available Color/Finishes

Color tiles intended for reference only.

Color Code Description



CP Polished Chrome



Technical Information

All product dimensions are nominal.

Faucet:

Flow rate: 0.5 gal/min (1.9 l/min)
Pressure: 80 psi (5.5 bar)

Spout:

Spout reach: 4-3/8" (112 mm)
Handle clearance: 4-1/8" (105 mm)

Notes

Install this product according to the installation guide.

ADA, OBC, CSA B651 compliant when installed to the specific requirements of these regulations.

Inspiring Great Spaces®

PRODUCT SPEC PAGE

NATURAL CREATIONS® with Diamond10® Technology - ArborArt® | EarthCuts® | Mystix®
Luxury Flooring

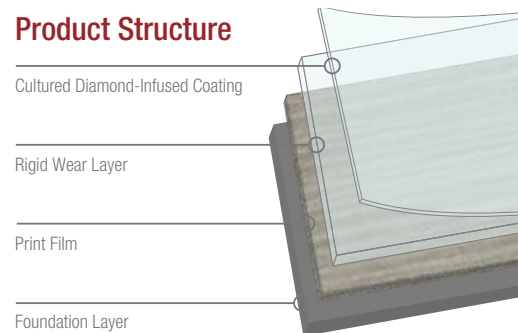
Product Information

Construction	Product Line	International Product Specifications	Overall Thickness Wear Layer Thickness	Factory Finish	Installation	Maintenance Options
Solid Vinyl Tile (a.k.a. Luxury Vinyl Tile - LVT)	ArborArt® EarthCuts® Mystix®	ASTM F 1700, Class III, Type B embossed surface	0.125 in. (3.2 mm) 0.020 in. (0.5 mm)	Diamond10® Coating	Full Spread Adhesives: S-288 Premium, S-240 Epoxy, S-310 Roll Strong™	No Polish – No Buff Polish

Packaging

Tile Sizes	Tiles per Carton/ Coverage	Shipping Weight per Carton
ArborArt®		
4 in. x 36 in. (101.6 mm x 914.4 mm)	44 – 44 ft² (4.09 m²)	54.45 lbs./carton (24.70 kg)
6 in. x 36 in. (152.4 mm x 914.4 mm)	30 – 45 ft² (4.18 m²)	55.73 lbs./carton (25.28 kg)
6 in. x 48 in. (152.4 mm x 1219.2 mm)	22 – 44 ft² (4.09 m²)	54.50 lbs./carton (24.72 kg)
9 in. x 48 in. (228.6 mm x 1219.2 mm)	15 – 45 ft² (4.18 m²)	55.77 lbs./carton (25.30 kg)
EarthCuts®		
12 in. x 24 in. (304.8 mm x 609.6 mm)	22 – 44 ft² (4.09 m²)	54.53 lbs./carton (24.73 kg)
18 in. x 18 in. (457.2 mm x 457.2 mm)	20 – 45 ft² (4.18 m²)	55.80 lbs./carton (25.31 kg)
18 in. x 36 in. (457.2 mm x 914.4 mm)	10 – 45 ft² (4.18 m²)	55.80 lbs./carton (25.31 kg)
Mystix®		
18 in. x 18 in. (457.2 mm x 457.2 mm)	20 – 45 ft² (4.18 m²)	55.80 lbs./carton (25.31 kg)
18 in. x 36 in. (457.2 mm x 914.4 mm)	10 – 45 ft² (4.18 m²)	55.80 lbs./carton (25.31 kg)
6 in. x 36 in. (152.4 mm x 914.4 mm)	30 – 45 ft² (4.18 m²)	55.73 lbs./carton (25.28 kg)

Product Structure



Testing

	Performance	Test Method	Requirement	Performance vs. Requirement
ASTM F 1700	Thickness	ASTM F 386	Nominal ± 0.005 in.	Meets
	Wear Layer Thickness	ASTM F 410	0.020 in. (0.5 mm) minimum for Commercial Use	Meets
	Size	ASTM F 2421	± 0.016 in. per linear foot	Meets
	Squareness	ASTM F 2421	0.010 in. maximum	Meets
	Residual Indentation	ASTM F 1914	Average less than 8%.	Meets
	Chemical Resistance	ASTM F 925	No more than slight change in surface dulling, attack or staining	Meets
	Heat Resistance	ASTM F 1514	ΔE < 8	Meets
	Light Resistance	ASTM F 1515	ΔE < 8	Meets
Additional Testing	Static Load Limit	ASTM F 970	≤ 0.005 in.	250 psi
	Dimensional Stability	Internal	≤ 0.018 in. per linear foot MD ≤ 0.012 in. per linear foot AMD	Meets
	Fire Test Data – Flame Spread	ASTM E 648	0.45 w/cm² or more Class I	Meets
	Fire Test Data – Smoke Evolution	ASTM E 662	450 or less	Meets
	Fire Test Data – Canada	CAN/ULC S102.2	Use dependent	Flame Spread - 10 Smoke Developed - 125
	ADA Standards for Accessible Design	Chapter 3 Section 302.1	Floor surfaces shall be stable, firm and slip resistant	Meets
	Static Coefficient of Friction*	ASTM D2047 UL 410	≥ 0.5	Meets

* Using the James Machine as described in D2047 and as directed in UL 410 for floor covering materials (FCM) using a leather foot under dry conditions. The application of site-applied floor sealers, polishes and other types of finishes routinely used to maintain resilient flooring materials will change the walking surface and consequently the SCOF value.

PRODUCT SPEC PAGE

NATURAL CREATIONS® with Diamond10® Technology - ArborArt® | EarthCuts® | Mystix® Luxury Flooring

Sustainability

Certification Attribute	Standard	3rd party Certification/Certifier
Low Emitting Material	CDPH v1.2 (2017) a.k.a CHPS 01350	FloorScore/SCS
Environmental Product Declaration (Industry EPD)	ISO 14025 and ISO 14040	Yes/ULE

Performance	Standard	Requirements	Performance vs. Requirements
TVOC Range	CDPH v1.2 (2017) a.k.a CHPS 01350	<0.5 mg/m³	Meets
Recycled Content	ISO 14021	Contains recycled content	29% pre-consumer recycled content
Low Emitting Adhesives S-288 S-240 S-310 Roll Strong™	FloorScore®/SCAQMD	Less than 50 g/L	S-288 Exceeds - 14 g/L S-240 Exceeds - 10 g/L S-310 Roll Strong™ Exceeds - 0 g/L
Material Ingredients/Transparency	LEED v4 (Option 1) WELL™ Feature 97	Content disclosure to 1000 ppm	Meets (See Armstrong Flooring Product Declaration)
Fundamental Material Safety Toxic Materials Reduction	WELL™ Feature 11 and 25	No asbestos, free of lead and phthalates (DEHP, DBP, BBP, DIDP, DNOP)	Meets

Limited Warranty

20-year Commercial Warranty when installed in accordance with the Armstrong Flooring Guaranteed Installation Systems manual, F-5061.

Links

Product Transparency	www.ArmstrongFlooring.com/transparency
Email Techline	www.ArmstrongFlooring.com/flooring-techline
Visit Floor Expert	www.floorexpert.com
Installation Instructions	www.ArmstrongFlooring.com/flooring-downloads
Maintenance Instructions	www.ArmstrongFlooring.com/flooring-downloads
View Full Line	www.ArmstrongFlooring.com/lvt



GET MOKA

Get Moka 30x60 . 11 3/4" x 23 5/8"

T-1
GET

Get Moka 30x60 . 11 3/4" x 23 5/8"



GET

Gres porcellanato colorato in massa
Porcelain stoneware coloured in body
Grès cérame coloré dans la masse
Durchgefärbtes Feinsteinzeug
Gres porcelánico coloreado en masa

Superficie: Matt
Surface: Matt
Surface: Mat
Oberfläche: Matt
Superficie: Mate



Get Almond 45x45
45x45 - 17³/₄"x17³/₄"



Get Beige 45x45
45x45 - 17³/₄"x17³/₄"



Get Almond 30x60
30x60 - 11³/₄"x23⁵/₈"



Get Beige 30x60
30x60 - 11³/₄"x23⁵/₈"



Get Almond 30x30
30x30 - 11³/₄"x11³/₄"



Get Beige 30x30
30x30 - 11³/₄"x11³/₄"

PEZZI SPECIALI . SPECIAL PIECES
Pièces spéciales - Sonderteile - Piezas especiales

	Get Almond		
	Get Beige		
	Get Greige		
	Get Moka		
		Battiscopa 7,2x45 - 2 ⁷ / ₈ "x17 ³ / ₄ "	Gradino 30x60 - 11 ³ / ₄ "x23 ⁵ / ₈ "

45x45 - 17³/₄"x 17³/₄" - 9 mm
30x60 - 11³/₄"x 23⁵/₈" - 9 mm
30x30 - 11³/₄"x 11³/₄" - 8 mm



Get Greige 45x45
45x45 - 17³/₄"x17³/₄"



Get Moka 45x45
45x45 - 17³/₄"x17³/₄"



Get Greige 30x60
30x60 - 11³/₄"x23⁵/₈"



Get Moka 30x60
30x60 - 11³/₄"x23⁵/₈"



Get Greige 30x30
30x30 - 11³/₄"x11³/₄"



Get Moka 30x30
30x30 - 11³/₄"x11³/₄"

GREEN PROJECT - LEED



Contiene oltre il 40% di materiale riciclato pre-consumer e può contribuire al raggiungimento di 2 crediti LEED.
Manufactured with minimum 40% of pre-consumer recycled materials, it can contribute to the awarding of 2 LEED credits.
Contient plus de 40% de matière recyclée pre-consumer et il peut contribuer à obtenir 2 crédits LEED.
Enthält 40% pre-konsumer Recyclingmaterial welches zur Erreichung von 2 LEED Punkten beitragen kann.
Contiene más de un 40% de materiales reciclados pre-consumer y puede contribuir al conseguimiento de 2 puntos LEED.



Contiene oltre il 20% di materiale riciclato pre-consumer e può contribuire al raggiungimento di 1 credito LEED.
Manufactured with minimum 20% of pre-consumer recycled materials, it can contribute to the awarding of 1 LEED credit.
Contient plus de 20% de matière recyclée pre-consumer et il peut contribuer à obtenir crédit LEED.
Enthält 20% pre-konsumer Recyclingmaterial welches zur Erreichung von LEED Punkt beitragen kann.
Contiene más de un 20% de materiales reciclados pre-consumer y puede contribuir al conseguimiento de 1 punto LEED.



45x45 cm | 7^{3/4"} x | 7^{3/4"} ± 9 mm
30x60 cm | 11^{3/4"} x | 23^{5/8"} ± 9 mm
30x30 cm | 11^{3/4"} x | 11^{3/4"} ± 8 mm

Compliant with standards EN 1441 | annex G group B1a Conforme alla norma EN 1441 | Appendice G gruppo B1a
Compliant with standards ISO 13006 annex G group B1a Conforme alla norma ISO 13006 Appendice G gruppo B1a

		Technical features Caratteristica tecnica	Test Method Metodo di prova	Requirements for nominal size N Requisiti per dimensione nominale N			GET	
				7 cm ≤ N < 15 cm	N ≥ 15 cm			
				(mm)	(%)	(mm)		
REGULARITY CHARACTERISTICS CARATTERISTICHE DI REGOLARITÀ		Length and width Lunghezza e larghezza	ISO 10545-2	± 0,9 ⁽¹⁰⁾	± 0,6 ⁽¹⁰⁾	± 2,0 ⁽¹⁰⁾	± 0,4% ± 1,5 mm	
		Thickness Spessore		± 0,5 ^(10a)	± 5 ^(10a)	± 0,5 ^(10a)	± 5,0% ± 0,5 mm	
		Straightness of sides Rettilineità degli spigoli		± 0,75 ^(10aaa)	± 0,5 ^(10aaa)	± 1,5 ^(10aaa)	Suitable for Conforme	
		Rectangularity Ortogonalità		± 0,75 ^(10aaa)	± 0,5 ^(10aaa)	± 2,0 ^(10aaa)		
		Surface flatness Planarità	c.c. ± 0,75	c.c. ± 0,5	c.c. ± 2,0	± 0,3% ± 1,5 mm		
			e.c. ± 0,75	e.c. ± 0,5	e.c. ± 2,0			
			w. ± 0,75	w. ± 0,5	w. ± 2,0			
			EN 1441 annex G (Group B1a) EN 1441 appendice G (Gruppo B1a)		ISO 13006 annex G (Group B1a) ISO 13006 appendice G (Gruppo B1a)			
STRUCTURAL CHARACTERISTICS CARATTERISTICHE STRUTTURALI			Water absorption Massa d'acqua assorbita	ISO 10545-3	E _a ≤ 0,5% Individual Maximum 0,6% E _a ≤ 0,5% Valore massimo singolo 0,6%		≤ 0,1 %	
BULK MECHANICAL CHARACTERISTICS CARATTERISTICHE MECCANICHE MASSIVE			Breaking strength Sforzo di rottura	ISO 10545-4	S ≥ 1300 N		S ≥ 15000 N	
		Modulus of rupture Resistenza alla flessione	R ≥ 35 N/mm ²		R ≥ 40 N/mm ²			
			Impact resistance, as coefficient of restitution Resistenza all'impatto, espresso come coefficiente di restituzione	ISO 10545-5	Declared value Dichiarare un valore	Test method available Metodo di prova disponibile		≥ 0,55
SURFACE MECHANICAL CHARACTERISTICS CARATTERISTICHE MECCANICHE SUPERFICIALI			Mohs hardness Durezza Mohs	EN 101 ⁽¹¹⁾	≥ 6 (UGL)		Suitable for Conforme	
			Resistance to deep abrasion of unglazed tiles (removed volume) Resistenza all'abrasione profonda delle piastrelle non smaltate (volume materiale asportato)	ISO 10545-6	≤ 175 mm ³		≤ 150 mm ³	
THERMAL AND HYGROMETRIC CHARACTERISTICS CARATTERISTICHE TERMO IGMOMETRICHE			Coefficient of thermal linear expansion Coefficiente di dilatazione termica lineare	ISO 10545-8	Declared value Dichiarare un valore	Test method available Metodo di prova disponibile		≤ 7 MK ⁻¹
			Thermal shock resistance Resistenza agli sbalzi termici	ISO 10545-9	Pass according to ISO 10545-1 Test superato in accordo con ISO 10545-1	Test method available Metodo di prova disponibile		Resistant Resiste
			Moisture expansion (in mm/m) Dilatazione all'umidità (in mm/m)	ISO 10545-10	Declared value Dichiarare un valore	Test method available Metodo di prova disponibile		≤ 0,01% (0,1mm/m)
			Frost resistance Resistenza al gelo	ISO 10545-12	Pass according to ISO 10545-1 Test superato in accordo con ISO 10545-1	Test method available Metodo di prova disponibile		Resistant Resiste
PHYSICAL PROPERTIES PROPRIETÀ FISICHE			Bond strength/adhesion for improved cementitious adhesives Adesione a trazione con adesivi cementizi migliorati	EN 1348	Declared value Dichiarare un valore	-		≥ 1,0 N/mm ² (Class C2 - EN 12004)
			Reaction to fire Reazione al fuoco	-	Class A1 or A1 _s Classe A1 oppure A1 _s	-		A1 - A1 _s
CHEMICAL CHARACTERISTICS CARATTERISTICHE CHIMICHE			Resistance to household chemicals and swimming pool salts Resistenza ai prodotti chimici di uso domestico ed agli additivi per piscina	ISO 10545-13	Minimum Class B (U for unglazed tiles) Classe minima B (U per piastrelle non smaltate)		UA	
			Resistance to low concentrations of acids and alkalis Resistenza a basse concentrazioni di acidi e alcali		Declared Class Dichiarare una Classe	Test method available Metodo di prova disponibile		ULA
			Resistance to high concentrations of acids and alkalis Resistenza ad alte concentrazioni di acidi e alcali		Declared Class Dichiarare una Classe	Test method available Metodo di prova disponibile		UHA
			Resistance to staining Resistenza alle macchie	ISO 10545-14	Minimum Class 3 Classe 3 minima		5	
SAFETY CHARACTERISTICS ⁽¹²⁾ CARATTERISTICHE DI SICUREZZA ⁽¹²⁾			Barefoot Ramp Test Metodo della rampa a piedi nudi	DIN 51097 (CEN/TS 16165, Annex A)	Declared value Dichiarare un valore		A	
			Shod Ramp Test Metodo della rampa "calzato"	DIN 51130 (CEN/TS 16165, Annex B)	Declared value Dichiarare un valore		R9	
			Pendulum Friction Test Metodo del Pendolo	UNE-ENV 12633 (CEN/TS 16165, Annex C) BS 7976-2002 (CEN/TS 16165, Annex C)	Declared value Dichiarare un valore		Class I PTV > 36 Dry PTV = 25-35 Wet	
SAFETY CHARACTERISTICS CARATTERISTICHE DI SICUREZZA			Coefficient of friction (COF) Coefficiente di attrito	B.C.R.A. Rep. CEC/BI	D.M. 236/89 del 14/06/89 μ >0,40 per elemento scivolante cuoio su pavimentazione asciutta μ >0,40 per elemento scivolante gomma dura su pavimentazione bagnata		> 0,40 Asciutto > 0,40 Bagnato	
			Dynamic coefficient of friction (DCOF) Coefficiente di attrito dinamico	ANSI A137.1-2012	ANSI A.137.1 Requires a minimum value of 0.42 for commercial areas that are likely to be wet.		> 0,42 Wet	
			Static coefficient of friction (SCOF) Coefficiente di attrito statico	ASTM C1028-2007	The Ceramic Tiles Institute identifies Tile Slip Resistant when SCOF ≥ 0,60		≥ 0,60 Dry ≥ 0,60 Wet	
			Pendulum Friction Test Metodo del Pendolo	AS/NZS 4586-2004, Appendix A (Four 5 rubber)	Declared Classification of the pedestrian surface materials according to the Wet Pendulum Test		Class X	

⁽¹⁰⁾ The permissible deviation, in % or mm, of the average size for each tile (2 or 4 sides) from work size (W). Deviazione ammissibile, in % oppure mm, della dimensione media di ogni piastrella (2 oppure 4 lati) dalla dimensione di fabbricazione (W).

^(10a) The permissible deviation, in % or mm, of the average size for each tile from the work size thickness (W). Deviazione ammissibile, in % oppure mm, dello spessore medio di ogni piastrella dalla dimensione di fabbricazione (W).

^(10aa) The maximum permissible deviation from straightness, in % or mm, related to the corresponding work sizes (W). Deviazione massima ammissibile di rettilineità, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.

^(10aaa) The maximum permissible deviation from rectangularity, in % or mm, related to the corresponding work sizes (W). Deviazione massima ammissibile di ortogonalità, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.

c.c. The maximum permissible deviation from centre curvature, in % or mm, related to diagonal calculated from the work sizes (W). Deviazione massima ammissibile della curvatura del centro, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).

e.c. The maximum permissible deviation from edge curvature, in % or mm, related to the corresponding work sizes (W). Deviazione massima ammissibile della curvatura dello spigolo, in % oppure mm, in rapporto alle dimensioni di fabbricazione (W) corrispondenti.

w. The maximum permissible deviation from warpage, in % or mm, related to diagonal calculated from the work sizes (W). Deviazione massima ammissibile dello evergolamento, in % oppure mm, in rapporto alla diagonale calcolata secondo le dimensioni di fabbricazione (W).

(1). Requirements european standard EN 176. Requisiti richiesti normative europea EN 176.

(2). Determination of slip resistance of pedestrian surfaces; it does not cover sports surfaces and road surfaces for vehicles (skid resistance). Determinazione della resistenza allo scivolamento delle superfici pedonabili; non si applica alle pavimentazioni sportive ed alle pavimentazioni stradali veicolari.

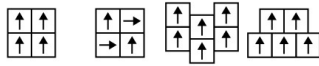
surround tile

product type:	carpet tile
collection:	Space Worx
style number:	5T125
construction:	multi-level pattern loop
fiber:	eco solution a® nylon
dye method:	100% solution dyed
primary backing:	synthetic
secondary backing:	ecoworx® tile
protective treatments:	ssp® shaw soil protection
warranty:	lifetime commercial limited

	u.s.	metric
product size:	24.0 x 24.0 inches	61.0 x 61.0 cm
gauge:	1/12 inch	47.2 per 10cm
stitches	9 per inch	37 per 10cm
finished pile thickness:	0.084 inches	2.13 mm
average density:	6429 per cu.yd.	0.238 g/cm3
kilotex:		9.27 kilotex
total thickness:	0.222 inches	5.64 mm
tufted weight:	15.0 oz/yd2	508.6 gms/sqm
pattern repeat:	none	none



recommended installation method



monolithic quarter turn ashlar brick

coordinating products

carpet tile: **basic tile**, **primary tile**, **centric tile**

performance + testing

antimicrobial assessment:	passes (AATCC-174) (When installed using Shaw 5036 adhesive)
pill test:	pass
radiant panel:	class I
nbs smoke:	less than 450
electrostatic propensity:	less than 3.5 kv
CR! greenlabel plus:	USA (GLP9968)
ADA compliance:	This product meets the guidelines as set forth in the Americans with Disabilities Act for minimum static coefficient of friction of 0.6 for accessible routes.

corporate headquarters +1 800 257 7429 | +1 706 532 7984 | **atlanta** +1 404 853 7429 | **bangalore** +9180 6759 0334 x 0335 | **beijing** +86 10 6568 5881 | **chicago** +1 312 467 1331 | **dubai** +971 4 313 2496 | **hong kong** +852 2623 0371 | **latin america (miami)** +1 305 827 5912 | **london** +44 207 961 4120 | **los angeles** +1 800 233 1614 | **melbourne** +61 3 9939 8543 | **mexico city** +55 5010 7600 | **nantong** +86 400 800 7429 | **new york** +1 212 953 7429 | **san francisco** +1 415 955 1920 | **santiago** +562 2431 5000 x 550 | **shanghai** +86 21 5258 9799 | **singapore** +65 6733 1811 | **sydney** +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

1 of 2

product transparency

Shaw Contract is dedicated to providing clients with a building chemistry that's safe and dependable. Working together, we will help you meet your goals as they pertain to material health. EcoWorx products with Eco Solution Q nylon are Cradle to Cradle Certified (tm) Silver and assessed for impacts on human health and the environment. This product can be recycled. When it's time to replace, we can collect and recycle it through our Environmental Guarantee.*

attributes + certifications

Cradle to Cradle Certified™	silver level (version 3.1)
Health Product Declaration (HPD):	1,000 ppm disclosure
Environmental Product Declaration (EPD):	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
Living Building Challenge (LBC):	free of red list chemicals
Declare:	LBC compliant
nsf 140:	gold
CRI Green Label Plus (GLP):	USA (GLP9968)
Building Research Establishment (BRE):	certified
Good Environmental Choice Australia (GECA):	certified
Singapore Green Label:	039-003
ce marking (EN 14041):	3rd party certified
environmental guarantee*:	free pickup & delivery available north america
total recycled content:	45% (post industrial 45% post consumer 0%)
product packaging:	100% recyclable
country of origin**:	USA

green leed contribution credit

MR Credit: Building Product Disclosure and Optimization Environmental Product Declarations - Option 1. Environmental Product Declaration (EPD)	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 1: Material Ingredient Reporting	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 2. Material Ingredient Optimization	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 1. Raw Material Source and Extraction Reporting	annual GRI sustainability report
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 2: Leadership Extraction Practices	environmental guarantee: free pickup & delivery available north america
EQ Credit: Low Emitting Materials Option 1. Product Category Calculations	green label plus certification: GLP9968
MR Credit: Interiors Life-Cycle Impact Reduction Option 3. Design for Flexibility	ecoworx tile w/ lokdots installation system

additional information

* To learn more about the recyclability of our products and our Environmental Guarantee, please visit shawcontract.com.

**Meets or exceeds all local and national regulations in country of manufacture.



corporate headquarters +1 800 257 7429 | +1 706 532 7984 | **atlanta** +1 404 853 7429 | **bangalore** +9180 6759 0334 x 0335 | **beijing** +86 10 6568 5881 | **chicago** +1 312 467 1331 | **dubai** +971 4 313 2496 | **hong kong** +852 2623 0371 | **latin america (miami)** +1 305 827 5912 | **london** +44 207 961 4120 | **los angeles** +1 800 233 1614 | **melbourne** +61 3 9939 8543 | **mexico city** +55 5010 7600 | **nantong** +86 400 800 7429 | **new york** +1 212 953 7429 | **san francisco** +1 415 955 1920 | **santiago** +562 2431 5000 x 550 | **shanghai** +86 21 5258 9799 | **singapore** +65 6733 1811 | **sydney** +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

2 of 2

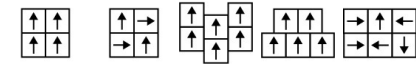
color frame tile

product type:	carpet tile
collection:	Color Frame and Color Form
style number:	5T081
construction:	multi-level pattern loop
fiber:	eco solution a® nylon
dye method:	100% solution dyed
primary backing:	synthetic
secondary backing:	ecoworx® tile
protective treatments:	ssp® shaw soil protection
warranty:	lifetime commercial limited

	u.s.	metric
product size:	24.0 x 24.0 inches	61.0 x 61.0 cm
gauge:	1/12 inch	47.2 per 10cm
stitches	10.5 per inch	41 per 10cm
finished pile thickness:	0.090 inches	2.29 mm
average density:	7200 per cu.yd.	0.267 g/cm3
kilotex:		10.90 kilotex
total thickness:	0.220 inches	5.59 mm
tufted weight:	18.0 oz/yd2	610.3 gms/sqm
pattern repeat:	none	none
gsa approved product	true	



recommended installation method



monolithic quarter turn ashlar brick random

coordinating products

carpet tile: [color form tile](#)

performance + testing

antimicrobial assessment:	passes (AATCC-174) (When installed using Shaw 5036 adhesive)
pill test:	pass
radiant panel:	class I
nbs smoke:	less than 450
electrostatic propensity:	less than 3.5 kv
CR1 greenlabel plus:	USA (GLP9968) China (GLP1263)
ADA compliance:	This product meets the guidelines as set forth in the Americans with Disabilities Act for minimum static coefficient of friction of 0.6 for accessible routes.

corporate headquarters +1 800 257 7429 | +1 706 532 7984 | atlanta +1 404 853 7429 | bangalore +9180 6759 0334 x 0335 | beijing +86 10 6568 5881 | chicago +1 312 467 1331 | dubai +971 4 313 2496 | hong kong +852 2623 0371 | latin america (miami) +1 305 827 5912 | london +44 207 961 4120 | los angeles +1 800 233 1614 | melbourne +61 3 9939 8543 | mexico city +55 5010 7600 | nantong +86 400 800 7429 | new york +1 212 953 7429 | san francisco +1 415 955 1920 | santiago +562 2431 5000 x 550 | shanghai +86 21 5258 9799 | singapore +65 6733 1811 | sydney +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

1 of 2

product transparency

Shaw Contract is dedicated to providing clients with a building chemistry that's safe and dependable. Working together, we will help you meet your goals as they pertain to material health. EcoWorx products with Eco Solution Q nylon are Cradle to Cradle Certified (tm) Silver and assessed for impacts on human health and the environment. This product can be recycled. When it's time to replace, we can collect and recycle it through our Environmental Guarantee.*

attributes + certifications

Cradle to Cradle Certified™	silver level (version 3.1)
Health Product Declaration (HPD):	1,000 ppm disclosure
Environmental Product Declaration (EPD):	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
Living Building Challenge (LBC):	free of red list chemicals
Declare:	LBC compliant
nsf 140:	gold
CRI Green Label Plus (GLP):	USA (GLP9968) China (GLP1263)
Building Research Establishment (BRE):	certified
Good Environmental Choice Australia (GECA):	certified
Singapore Green Label:	039-003
ce marking (EN 14041):	3rd party certified
environmental guarantee*:	free pickup & delivery available north america
total recycled content:	45% (post industrial 45% post consumer 0%)
product packaging:	100% recyclable
country of origin**:	USA & China

green leed contribution credit

MR Credit: Building Product Disclosure and Optimization Environmental Product Declarations - Option 1. Environmental Product Declaration (EPD)	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 1: Material Ingredient Reporting	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 2. Material Ingredient Optimization	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 1. Raw Material Source and Extraction Reporting	annual GRI sustainability report
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 2: Leadership Extraction Practices	environmental guarantee: free pickup & delivery available north america
EQ Credit: Low Emitting Materials Option 1. Product Category Calculations	green label plus certification: GLP9968
MR Credit: Interiors Life-Cycle Impact Reduction Option 3. Design for Flexibility	ecoworx tile w/ lokdots installation system

additional information

* To learn more about the recyclability of our products and our Environmental Guarantee, please visit [shawcontract.com](#).

**Meets or exceeds all local and national regulations in country of manufacture.



corporate headquarters +1 800 257 7429 | +1 706 532 7984 | **atlanta** +1 404 853 7429 | **bangalore** +9180 6759 0334 x 0335 | **beijing** +86 10 6568 5881 | **chicago** +1 312 467 1331 | **dubai** +971 4 313 2496 | **hong kong** +852 2623 0371 | **latin america (miami)** +1 305 827 5912 | **london** +44 207 961 4120 | **los angeles** +1 800 233 1614 | **melbourne** +61 3 9939 8543 | **mexico city** +55 5010 7600 | **nantong** +86 400 800 7429 | **new york** +1 212 953 7429 | **san francisco** +1 415 955 1920 | **santiago** +562 2431 5000 x 550 | **shanghai** +86 21 5258 9799 | **singapore** +65 6733 1811 | **sydney** +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

2 of 2

color form tile

product type:	carpet tile
collection:	Color Frame and Color Form
style number:	5T112
construction:	multi-level pattern loop
fiber:	eco solution a® nylon
dye method:	100% solution dyed
primary backing:	synthetic
secondary backing:	ecoworx® tile
protective treatments:	ssp® shaw soil protection
warranty:	lifetime commercial limited

	u.s.	metric
product size:	9.0 x 36.0 inches	22.9 x 91.4 cm
gauge:	1/12 inch	47.2 per 10cm
stitches	10 per inch	40 per 10cm
finished pile thickness:	0.094 inches	2.39 mm
average density:	6511 per cu.yd.	0.241 g/cm3
kilotex:		10.54 kilotex
total thickness:	0.220 inches	5.59 mm
tufted weight:	17.0 oz/yd2	576.4 gms/sqm
pattern repeat:	none	none



recommended installation method



monolithic



brick



ashlar



herringbone

coordinating products

carpet tile: **color frame tile**

performance + testing

antimicrobial assessment:	passes (AATCC-174) (When installed using Shaw 5036 adhesive)
pill test:	pass
radiant panel:	class I
nbs smoke:	less than 450
electrostatic propensity:	less than 3.5 kv
CRI greenlabel plus:	USA (GLP9968) China (GLP1263)
ADA compliance:	This product meets the guidelines as set forth in the Americans with Disabilities Act for minimum static coefficient of friction of 0.6 for accessible routes.

corporate headquarters +1 800 257 7429 | +1 706 532 7984 | atlanta +1 404 853 7429 | bangalore +9180 6759 0334 x 0335 | beijing +86 10 6568 5881 | chicago +1 312 467 1331 | dubai +971 4 313 2496 | hong kong +852 2623 0371 | latin america (miami) +1 305 827 5912 | london +44 207 961 4120 | los angeles +1 800 233 1614 | melbourne +61 3 9939 8543 | mexico city +55 5010 7600 | nantong +86 400 800 7429 | new york +1 212 953 7429 | san francisco +1 415 955 1920 | santiago +562 2431 5000 x 550 | shanghai +86 21 5258 9799 | singapore +65 6733 1811 | sydney +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

1 of 2

product transparency

Shaw Contract is dedicated to providing clients with a building chemistry that's safe and dependable. Working together, we will help you meet your goals as they pertain to material health. EcoWorx products with Eco Solution Q nylon are Cradle to Cradle Certified (tm) Silver and assessed for impacts on human health and the environment. This product can be recycled. When it's time to replace, we can collect and recycle it through our Environmental Guarantee.*

attributes + certifications

Cradle to Cradle Certified™	silver level (version 3.1)
Health Product Declaration (HPD):	1,000 ppm disclosure
Environmental Product Declaration (EPD):	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
Living Building Challenge (LBC):	free of red list chemicals
Declare:	LBC compliant
nsf 140:	gold
CRI Green Label Plus (GLP):	USA (GLP9968) China (GLP1263)
Building Research Establishment (BRE):	certified
Good Environmental Choice Australia (GECA):	certified
Singapore Green Label:	039-003
ce marking (EN 14041):	3rd party certified
environmental guarantee*:	free pickup & delivery available north america
total recycled content:	45% (post industrial 45% post consumer 0%)
product packaging:	100% recyclable
country of origin**:	USA & China

green leed contribution credit

MR Credit: Building Product Disclosure and Optimization Environmental Product Declarations - Option 1. Environmental Product Declaration (EPD)	3rd party certified in accordance with ISO14044, ISO14025 & EN15804
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 1: Material Ingredient Reporting	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Material Ingredients - Option 2. Material Ingredient Optimization	C2C silver level (version 3.1)
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 1. Raw Material Source and Extraction Reporting	annual GRI sustainability report
MR Credit: Building Product Disclosure and Optimization Sourcing of Raw Materials - Option 2: Leadership Extraction Practices	environmental guarantee: free pickup & delivery available north america
EQ Credit: Low Emitting Materials Option 1. Product Category Calculations	green label plus certification: GLP9968
MR Credit: Interiors Life-Cycle Impact Reduction Option 3. Design for Flexibility	ecoworx tile w/ lokdots installation system

additional information

* To learn more about the recyclability of our products and our Environmental Guarantee, please visit shawcontract.com.

**Meets or exceeds all local and national regulations in country of manufacture.



corporate headquarters +1 800 257 7429 | +1 706 532 7984 | **atlanta** +1 404 853 7429 | **bangalore** +9180 6759 0334 x 0335 | **beijing** +86 10 6568 5881 | **chicago** +1 312 467 1331 | **dubai** +971 4 313 2496 | **hong kong** +852 2623 0371 | **latin america (miami)** +1 305 827 5912 | **london** +44 207 961 4120 | **los angeles** +1 800 233 1614 | **melbourne** +61 3 9939 8543 | **mexico city** +55 5010 7600 | **nantong** +86 400 800 7429 | **new york** +1 212 953 7429 | **san francisco** +1 415 955 1920 | **santiago** +562 2431 5000 x 550 | **shanghai** +86 21 5258 9799 | **singapore** +65 6733 1811 | **sydney** +1 800 556 302

© 2018 shaw industries group, inc., a berkshire hathaway company

february 26, 2019

2 of 2

FEATURES & SPECIFICATIONS

INTENDED USE — Provides a minimum of 90 minutes illumination for the rated wattage upon loss of AC power. Ideal for applications requiring attractive LED unit equipment with quick installation and unparallel performance. **Certain airborne contaminants can diminish integrity of acrylic.** [Click here for Acrylic Environmental Compatibility table, for suitable uses.](#)

CONSTRUCTION — White, compact, low-profile contemporary design. Engineering-grade thermoplastic housing is impact-resistant, scratch-resistant and corrosion-proof. UV-stable resin resists discoloration from natural and man-made light sources. Unit is also available in black.

Low-profile, integrated test switch/pilot light. Easily visible multicolor LED status indicator.

Unique track-and-swivel arrangement permits full range of direction of lamp head adjustment. Universal J-box mounting pattern. Tool-less access for maintenance. **US Patent No. D483,511.**

OPTICS — Two high-performance LED lamp heads rated at 5.4 watts each. Two white LEDs per head provides a redundant light source that ensures emergency lighting performance. The typical life of an LED is 10 years.

Linear Pattern (LP) is designed for uniform emergency lighting applications.

Advanced electrical design provides constant light output throughout the entire discharge period.

Single fixture illuminates a 75' long 6' wide path of egress at a 12' mounting height.

ELECTRICAL — Universal input voltage capability (120 through 277V, 50 or 60Hz).

Power factor correction is greater than 0.9 at 120V (0.7 at 277V) which contributes to increased efficiency and energy savings.

Current limiting charger maximizes battery life and minimizes energy consumption while providing lower operating costs and short circuit protection.

Thermal protection senses battery temperatures and terminates charge current to prevent overheating.

Regulated charge voltage maintains a stable charge voltage over a wide range of line voltages.

Prevents over/undercharging that shortens battery life and reduces capacity.

Brownout protection is automatically switched to emergency mode when supply voltage drops below approximately 80 percent nominal of 120, 220 or 277. Other input voltages may vary.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Battery: Sealed, maintenance-free Lithium Iron Phosphate. Automatic 24-hour recharge after a 90-minute discharge.

Diagnostics: Continuously monitors AC functionality. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection.

Standard derangement monitoring will indicate disconnected battery, charger failure and display an amber indicator light while in Emergency mode.

Self-diagnostics (SD option): Single multi-chromatic LED indicator to display two-state charging, test activation and three-state self-diagnostics.

Self-diagnostic testing: Five minutes every 30 days and 90 minutes annually.

Diagnostic evaluation of: Lamps, AC to DC transfer, battery charging and condition and microprocessor.

Automatic test is easily postponed for eight hours by activating manual test switch or use of remote tester.

INSTALLATION — Ceiling mount standard. Flexible conduit entry provision on top of the unit. **US Patent No. D483,511.**

Catalog Number
Notes
Type



LED Thermoplastic Emergency Light



ELMLT

LITHIUM IRON PHOSPHATE



Specifications

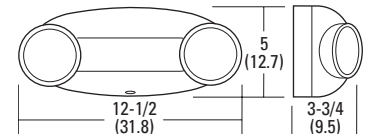
Length: 12-1/2 (31.8)

Depth: 3-3/4 (9.5)

Height: 5 (12.7)

Weight: 4.0 lbs (1.8 kg)

All dimensions are inches (centimeters) unless otherwise indicated.



LISTINGS — UL damp location listed standard 10.8-watts at 50°-104°F (10°-40°C) or 16.2-watts, 32-watts and 43-watts at 77°-104°F (25°-40°C). Meets UL 924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards. Meets all applicable FCC requirements.

WARRANTY — 5-year limited warranty. (Battery is prorated). Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

ORDERING INFORMATION

For shortest lead times, configure product using **bolded options**.

Example: ELMLT W LP06VS LTP SD

ELMLT		LP06VS	LTP	
Series	Housing color	Lamp type	Battery type	Options
ELMLT LED thermoplastic emergency light	W White B Black	LP06VS 5.4W linear pattern	LTP Lithium iron phosphate, 9.6 volts	(blank) None HO High output (32-watt capacity) EHO Extra High output (43-watt capacity) RT Remote laser test (provides 30 second manual test) TD Time delay RO No lamp heads SD Self-diagnostics

Accessories: Order as separate catalog number.					
ELA VS	Thermoplastic vandal shield ¹	ELA W SGL LT24 LP03VS	Single LED indoor remote head, white ³	ELA W SGL LT24 LP06VS	Single LED indoor remote head, white ³
ELA WG1	Wireguard, 15"W x 13-1/2"H x 6"D ²	ELA W T LT24 LP03VS	Twin LED indoor remote head, white ³	ELA W T LT24 LP06VS	Twin LED indoor remote head, white ³
ELA LRT	Remote test (laser) for distances up to 15'	ELA B SGL LT24 LP03VS	Single LED indoor remote head, black ³	ELA B SGL LT24 LP06VS	Single LED indoor remote head, black ³
		ELA B T LT24 LP03VS	Twin LED indoor remote head, black ³	ELA B T LT24 LP06VS	Twin LED indoor remote head, black ³
		ELA W SGL LT24 LP05VS	Single LED indoor remote head, white ³		
		ELA W T LT24 LP05VS	Twin LED indoor remote head, white ³		
		ELA B SGL LT24 LP05VS	Single LED indoor remote head, black ³		
		ELA B T LT24 LP05VS	Twin LED indoor remote head, black ³		

Notes

¹ See spec sheet [ELA VS-VS2](#).

² See spec sheet [ELA-WG](#).

³ See spec sheet [ELA-LT24](#) for wattage specifications.

ELMLT LED Quantum® Thermoplastic Emergency Light

SPECIFICATIONS

ELECTRICAL							
Primary Circuit							
Type	Volts	Input amps	Watts	Output volts	Watts output		
					1-1/2 hrs.	2 hrs.	4 hrs.
ELMLT	120	0.121	14.2	9.6	16.2	10.8	N/A
	277	0.073	14.7				
ELMLT HO	120	0.119	14.0	9.6	32.4	21.6	10.8
	277	0.073	14.6				
ELMLT EHO	120	0.117	13.8	9.6	43.2	32.4	16.2
	277	0.073	14.4				

BATTERY				
Lithium Iron Phosphate				
Voltage	Shelf life ¹	Typical life ^{1,3,4}	Maintenance ²	Optimum temperature ³
9.6	1 year	7 - 10 years	none	77° - 104°F (25° - 40°C)

REMOTE OUTPUT CAPACITY		
Option	R0 (less heads) ^{1,3}	(2) LP06VS lamps ⁵
Standard (5.4W)	16.2W	5.4W
HO (5.4W)	32W	21.2W
EHO (5.4W)	43W	32.2W

Notes

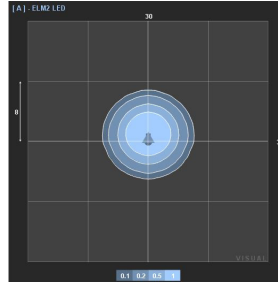
- 1 At 77°F (25°C).
- 2 All life safety equipment, including emergency lighting for path of egress, must be maintained, serviced and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service or testing could jeopardize the safety of occupants and will void all warranties.
- 3 Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.
- 4 Battery life is negatively impacted by many variables including temperature, charging rates, number of cycles and deep discharges due to long periods of time without AC power.
- 5 Remaining wattage for remote capacity.

MULTIPLE UNIT MAX SPACING - WALL-MOUNT					
Mounting Height	7.5'	10'	12'	16'	20'
Max Spacing @ 1FC Avg	54'	74'	75'	60'	58'
Max Spacing @ 1FC Min	31'	34'	34'	42'	34'
SINGLE UNIT MAX SPACING - WALL-MOUNT					
Mounting Height	7.5'	10'	12'	16'	20'
Max Spacing @ 1FC Avg	36'	48'	68'	54'	NA
Max Spacing @ 1FC Min	12'	12'	14'	18'	NA

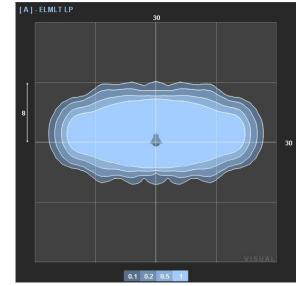
* Results assume Wall Mount with 6'-wide path of egress in 15'-wide aisle of 200X200'X30', open warehouse with reflectances of 10/10/10

SPACING GUIDELINES

*Note: To see complete photometric report or download the .ies file for this product, visit Lithonia Lighting ELMLT home page.

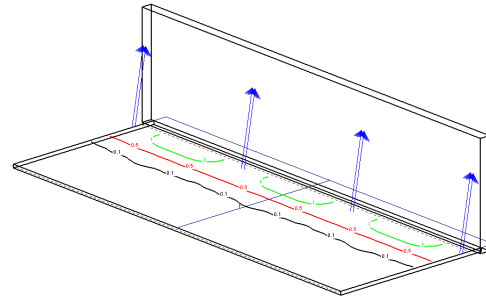


Traditional products use spot-like distributions that focus light in concentrated areas along the path of egress.

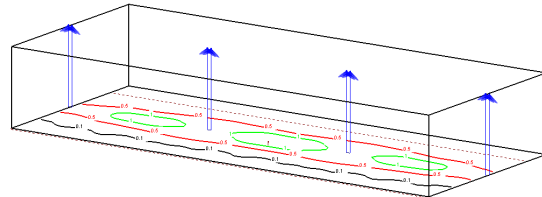


The ELMLT features a linear distribution which maximizes uniformity and fixture-to-fixture spacings.

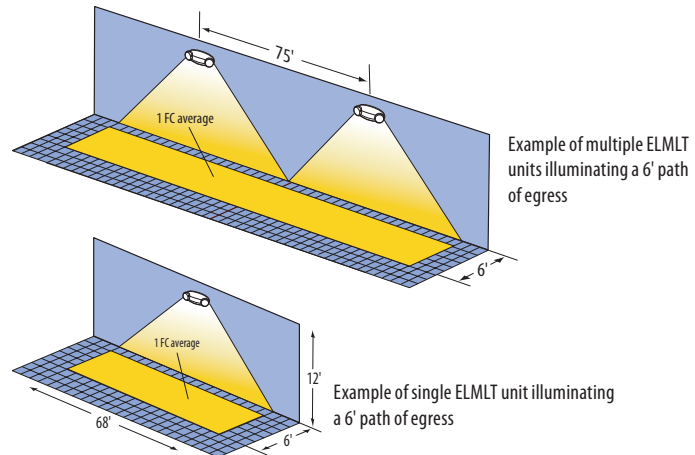
The broad photometric distribution pattern makes emergency lighting layouts reasonably quick and simple.



For wall mounted applications, a slight tilt away from the wall creates a uniform well-lit path of egress. Traditional circular pattern optics require multiple iterations using complex angles to meet the NFPA 101 requirements of 1fc-average, 1fc-minimum, and 40:1 maximum-to-minimum uniformity.



For ceiling mounted applications, simply aim the lamp heads straight down to create a uniform well-lit path of egress.



FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for applications requiring attractive edge-lit exit signage, universal installation and low energy consumption.

CONSTRUCTION — Extruded brushed aluminum finish.

Clear acrylic panels- letters measure 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL 924 standard.

For single-face clear panels, EXIT is seen as a reversed image from the back.

OPTICS — LEDs mounted on printed circuit board. The typical life of the exit LED lamp is 10 years.

The LED operating frequency is 120Hz.

ELECTRICAL — Dual voltage input capacity (120/277V).

Battery: (EL Option) — Sealed, maintenance free nickel-cadmium battery delivers 90 minutes capacity to emergency lamps. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection.

Self-diagnostic testing (EL Option Only) for 30 seconds every 30 days and 90 minutes annually. Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition.

INSTALLATION — EDG — Universal surface (top, end or back) mounting. Canopy provided.

EDGR — Recessed mounting. Bar hanger and brackets provided for both new or restricted ceiling access installation applications. Back wall mount (WM) option.

Universal directional indicators. Field selected and attached.

LISTINGS — UL damp location listed 32°-122°F (0°-50°C) standard. Meets UL924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25°C.

Specifications subject to change without notice.

Catalog Number
Notes
Type



EDG (surface mount)



EDGR (recessed mount)

LED Edge-Lit Exits

EDG
EDGR

LED Lamps



Specifications

EDG (End Mount)	EDG (Top Mount)
Length: 13-5/8 (34.6)	Length: 13 (33.0)
Depth: 5-1/2 (14.0)	Depth: 4-5/16 (11.0)
Height: 11-1/8 (28.3)	Height: 11-3/4 (29.8)
Shipping Weight : 4 lbs (1.8 kgs)	Shipping Weight : 4 lbs (1.8 kgs)
EDG (Back Mount)	EDGR
Length: 13 (33.0)	Length: 13 (33.0)
Depth: 3 (7.6)	Depth: 1-3/4 (4.4)
Height: 11-1/8 (28.3)	Height: 8 (20.3)
Shipping Weight : 4 lbs (1.8 kgs)	Shipping Weight : 6.8 lbs (3.1 kgs)
	Shipping Weight (WM option) : 8.1 lbs (3.7 kgs)

All dimensions are inches (centimeters) unless otherwise noted.

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: EDG 1 R EL

Family	Housing color	Number of faces	Letter color	Operations	Options
EDG Surface mount LED edge-lit exit	(blank) Brushed aluminum	1 Single face	R Red on clear (single face only) ¹	(blank) AC only	(blank) None
EDGR Recessed LED edge-lit exit	W White	2 Double face	G Green on clear (single face only) ¹	EL Nickel-cadmium battery	WM Recessed wall mount ⁶
			RMR Red on mirror ²	X2 Lamp wired on two separate AC circuits (specify 120V or 277V) ⁴	
			GMR Green on mirror ²	SD Self-diagnostics ⁵	
			RW Red on white ³		
			GW Green on white ³		

Accessories: Order as separate item.

ELA US12	12" stem kit with brushed aluminum canopy ⁷
ELA W US12	12" stem kit with white canopy ⁷

Notes

- For single-face clear panels, EXIT is seen as a reversed image from the back.
- Available with single and double face.
- White panel standard for double and single face.
- Not available with EL and SD options. Both circuits can be energized at the same time.
- Available with EL option only.
- Available on EDGR single face only
- See spec sheet [ELA-StemKits](#). Only available for EDG.

EDG-EDGR LED, Surface and Recessed Mount Edge-Lit Exits

SPECIFICATIONS

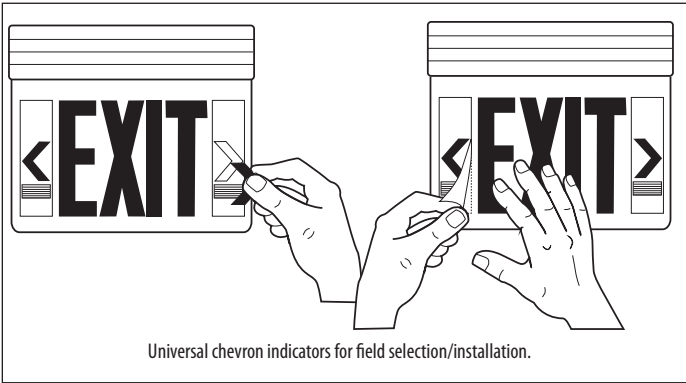
ELECTRICAL						
Primary Circuit						
Type	Typical LED life ¹	Supply voltage	EDG		EDGR	
			Input Watts	Max amps.	Input Watts	Max amps.
Red LED AC only	10 years	120	2.5	0.020	3.8	0.030
		277	2.8	0.010	4.5	0.014
Green LED AC only	10 years	120	2.2	0.020	3.8	0.030
		277	2.2	0.010	4.5	0.020
Red LED emergency	10 years	120	3.0	0.030	3.8	0.031
		277	3.1	0.010	4.5	0.015
Green LED emergency	10 years	120	2.6	0.020	3.8	0.031
		277	2.8	0.010	4.5	0.020

BATTERY (EL option)			
Sealed Nickel-Cadmium			
Shelf life ²	Typical life ²	Maintenance ³	Optimum temperature ⁴
3 years	7-9 years	none	32-122°F (0-50°C)

Notes

- Based on continuous operation. The typical life of the exit LED lamp is 10 years.
- At 77°F (25°C).
- All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.
- Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.

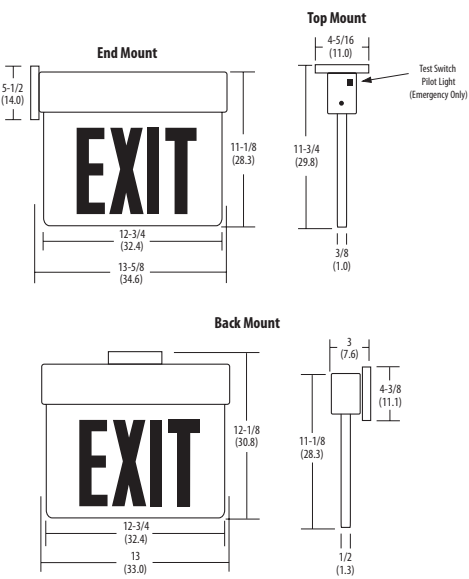
KEY FEATURES



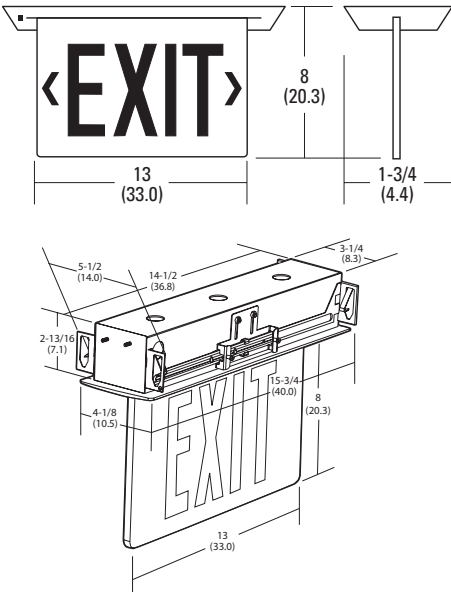
Universal chevron indicators for field selection/installation.

MOUNTING

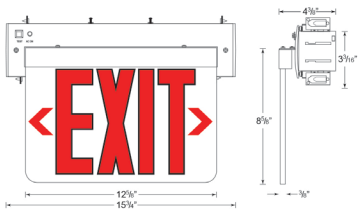
EDG



EDGR



EDGR WM option



FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for applications requiring both exit sign and unit equipment. Attractive, 8" tall, streamlined design is great for above-the-door applications and other tight fits. Optional high-output version with remote lamps are ideal for emergency egress lighting. **Certain airborne contaminants can diminish integrity of acrylic and/or polycarbonate.** [Click here for Acrylic- Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — Engineering-grade thermoplastic housing is impact-resistant, scratch-resistant and corrosion-proof. UL94V-0 flame rating. UV-stable resin resists discoloration from natural and man-made light sources.

Rugged unibody housing snaps together with no additional fasteners. Faceplate and back cover are interchangeable on housing. Positive snap-fit tabs hold faceplate securely, yet are easily removable for lamp compartment access. Universal, directional chevron inserts are easily removed and reinserted.

Uniform graphics illumination without shadows or hot spots. Letters are 6" high with 3/4" stroke, with 100 ft. viewing distance rating based upon UL924 standard.

LEDs mounted on primary circuit boards for sign illumination. Low-energy LED lamp in sign operates in normal (AC input) and emergency (DC input) modes.

Low-profile, integrated test switch/pilot light. Easily viewed bright red status indicator.

Unique track-and-swivel arrangement permits full range of direction of lamp head adjustment. Universal J-box mounting pattern. Tool-less access for maintenance. Conduit entry position on top of unit.

U.S. Patent No. 6,848,798; 6,499,866; 6,142,648; 5,797,673; D379,373; 5,526,251; D484,272; D473,672; 5,611,163; 5,646,502.

OPTICS — Twin LED lamp heads operate in emergency (DC input) mode with 12 series-parallel white LEDs in each head. Provides redundant light sources to ensure emergency lighting performance. The typical life of the exit LED lamp is 10 years.

ELECTRICAL — Dual-voltage input capability (120/277V). Edge connector on printed circuit board ensures long-term durability.

Current-limiting charger maximizes battery life and minimizes energy consumption. Provides low operating costs.

Short-circuit protection — current-limiting charger circuitry protects printed circuit board from shorts.

Thermal compensation adjusts charger output to provide optimum charge voltage relative to ambient temperature.

Regulated charge voltage maintains constant-charge voltage over a wide range of line voltages. Prevents over/undercharging that shortens battery life and reduces capacity.

Filtered charger input minimizes charge voltage ripple and extends battery life.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Single multi-color LED indicator to display two-state charging, test activation and three-state diagnostic test. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection. Self-diagnostic testing for 30 seconds every 30 days, 30 minutes at 180-day interval, and 90 minutes annually. Diagnostic evaluation of LED light source, AC-to-DC transfer, charging and battery condition.

Battery: Sealed, maintenance-free nickel-cadmium battery delivers 90-minute capacity to emergency lamps. Two-state constant-current charge maximizes battery life and automatically recharges after battery discharge. Low-voltage disconnect prevents excessively deep discharge that can permanently damage the battery. Optional high-output battery to power both local and optional LED remote lamp heads simultaneously.

Catalog Number
Notes
Type



QUANTUM®
Thermoplastic Exits

LHQM LED

LED Lamp Head
Nickel-Cadmium Battery

HO R0



INSTALLATION — Top, end or back mounting. Housing snaps to canopy with positive-locking tabs. Cam locking pin secures housing to canopy.

Easily removed mounting knockouts. Conduit entry knockout for 1/2" flexible conduit. J-box pattern on back panel.

LISTINGS — UL damp location listed standard 50°-104°F (10°-40°C). Meets UL 924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards.

WARRANTY — 5-year limited warranty. (Battery is prorated). Complete warranty terms located at www.AcuityBrands.com/CustomerResources/Terms_and_Conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: LHQM LED G

LHQM	LED				
Family	Lamp type	Housing color	Letter color	Options	
LHQM Stencil face, single face plate with extra face plate	LED Two 1.5W/9.6V white LED	(blank) White B Black	R Red G Green	HO High-output Ni-cad battery HO R0 High-output option, less lamp heads SD Self-diagnostics	NOM Meets Mexican standards¹ NOM SALIDA Salida signage (non-UL)²

Accessories: Order as separate catalog number.				
ELA Q L0309 SD	Single LED indoor remote head, white, self-diagnostics³,⁴,⁵	ELA WG3	Wireguard, 30"W x 13-1/2" H x 6" D⁶	
ELA T Q L0309 SD	Twin LED indoor remote head, white, self-diagnostics³,⁴,⁵	ELA WG2M	Wireguard, 21-1/4"W x 15" H x 12" D⁶	
ELA QWP L0309 SD	Single LED weather-proof remote head, gray, self-diagnostics³,⁴,⁵	ELA LQMUS12	12" white stem kit⁷	
ELA T QWP L0309 SD	Twin LED weather-proof remote head, gray, self-diagnostics³,⁴,⁵	ELA LED M12	Single LED remote lamp⁸,⁹	
ELA Q L0309	Single LED indoor remote head, white⁴,⁵	ELA LED T M12	Twin LED remote lamp⁸,⁹	
ELA T Q L0309	Twin LED indoor remote head, white⁴,⁵	ELA LED WP M12	Single LED Weather proof remote lamp⁸,⁹	
ELA QWP L0309	Single LED weather-proof remote head, gray⁴,⁵	ELA LED T WP M12	Twin LED Weather proof remote lamp⁸,⁹	
ELA T QWP L0309	Twin LED weather-proof remote head, gray⁴,⁵			

Notes

- Available in black or white. Consult factory for options.
- Only available in white. NOM standard.
- Only compatible with self-diagnostic option. (ex: HO SD)
- Also available in black. Add "B" after ELA to order black finish. Example: ELA B Q L0309.
- Only compatible with HO option. See spec sheet [ELA-Q-LED](#).
- See spec sheet [ELA-WG](#).
- See spec sheet [ELA-Stemkits](#).
- See spec sheet [ELA-LED](#) (Contractor Select LED Remotes).
- Not available with SD.

LHQM LED QUANTUM® Exit/Unit Combo

SPECIFICATIONS

Electrical				
Primary Circuit				
	Typical LED life ¹	Supply voltage	Max amps	Max watts
Red and green LED	10 years	120	.05	4.3
		277	.03	4.3

BATTERY

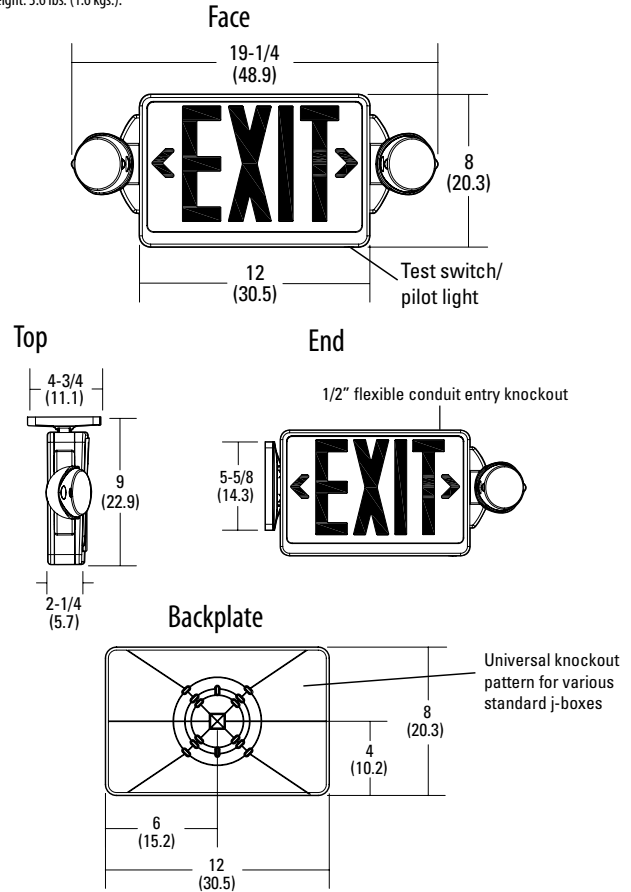
Ni-Cad				
Voltage	Typical Shelf life ²	Typical life ²	Maintenance ³	Optimum temperature ⁴
9.6	3 years	7-9 years	none	50-104°F (10-40°C)

- Based on continuous operation.
- At 77°F (25°C).
- All life safety equipment, including emergency lighting path of egress, must be maintained, serviced and tested in accordance with all National Fire Protection Association and local codes. Failure to perform the required maintenance, service or testing could jeopardize the safety of occupants and will void all warranties.
- Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.
- Battery life is negatively impacted by many variables including temperature, charging rates, number of cycles and deep discharges due to long periods of time without AC power.

Remote Output Capacity			
Standard unit	Combo	Combo/high-output battery(HO)	Combo/high-output (HO) and no heads (RO)
NA	NA	3W	6W

MOUNTING

All dimensions are inches (centimeters).
Shipping weight: 3.6 lbs. (1.6 kgs.).

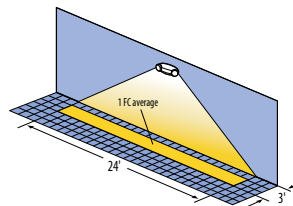


LAMP PHOTOMETRICS

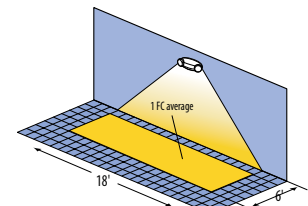
QUANTUM LED SERIES – SINGLE COVERAGE

3W Total White LEDs

Using a single unit at a typical 7.5' mounting height delivers an average illuminance of 1.0 FC over a distance of 24' on a 3' path of egress and 18' on a 6' path of egress.



Example of single LHQM LED exit illuminating a 3' path of egress

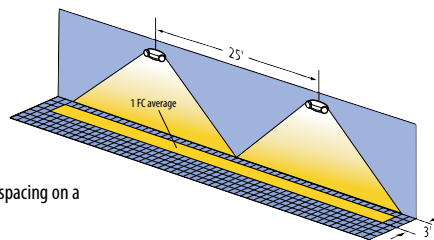


Example of single LHQM LED exit illuminating a 6' path of egress

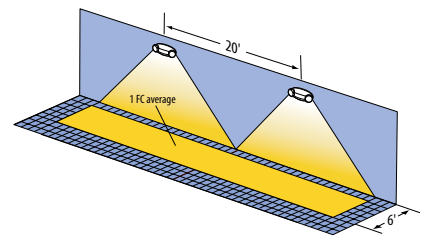
QUANTUM LED SERIES – MULTIPLE COVERAGE

3W Total White LEDs

Using multiple units at a typical 7.5' mounting height delivers 25' center-to-center spacing on a 3' path of egress and 20' center-to-center spacing on a 6' path of egress.



Example of multiple LHQM LED exits illuminating a 3' path of egress



Example of multiple LHQM LED exits illuminating a 6' path of egress

EXTENDED RUN-TIME FOR HIGH-OUTPUT EXITS

Product	Run time
LHQM LED HO (no remotes)	3.8 hours
LHQM LED HO RO (no remotes)	7.5 hours

FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination 1/2"-3/4" and four 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard; high ambient (40°C) option available. Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

OPTICS — LEDs are binned to a 3-step SDCM; 80 CRI minimum.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in specular, semi-specular, or matte diffuse finishes. Also available in white and black painted reflectors.

ELECTRICAL — Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% or 1% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 50,000 hours.

LISTINGS — Certified to US and Canadian safety standards. Damp location standard (wet location, covered ceiling optional). ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:

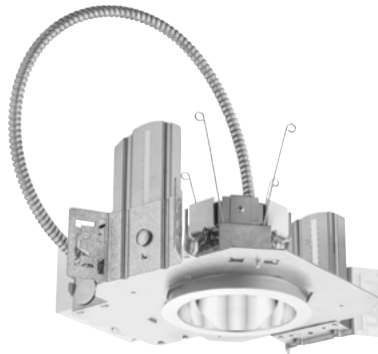
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

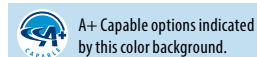
Specifications subject to change without notice.

Catalog Number
Notes
Type



LDN4

**4" OPEN
Non-IC
New Construction Downlight**



ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN4 35/15 L04AR LSS MVOLT EZ1

LDN4					
Series	Color temperature	Lumens ¹	Aperture/Trim Color	Finish	Voltage
LDN4 4" round	27/ 2700K	05 500 lumens	L04 Downlight	LSS Semi-specular	MVOLT Multi-volt
	30/ 3000K	10 1000 lumens	AR Clear	LD Matte diffuse	120 120V
	35/ 3500K	15 1500 lumens	LW4 Wallwash	WR ² White	277 277V
	40/ 4000K	20 2000 lumens		BR ² Black	347 ³ 347V
	50/ 5000K	25 2500 lumens			
		30 3000 lumens			

Driver	Options
GZ10 0-10V driver dims to 10%	SF ⁴ Single fuse
GZ1 0-10V driver dims to 1%	TRW ⁵ White painted flange
EZ10 0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 10%	TRBL ⁵ Black painted flange
	EL Emergency battery pack with integral test switch
	ELR Emergency battery pack with remote test switch
EZ1 0-10V eldoLED driver with smooth and flicker-free deep dimming performance down to 1%	ELSD Emergency battery pack with self-diagnostics, integral test switch
	ELRSD Emergency battery pack with self-diagnostics, remote test switch
	E10WCP Emergency battery pack, 10W Constant Power, CA Title 20 compliant with integral test switch
	E10WCPR Emergency battery pack, 10W Constant Power, CA Title 20 compliant with remote test switch
	NPP16D ⁶ nLight® network power/relay pack with 0-10V dimming for non-elidoLED drivers (GZ10, GZ1).
	NPP16DER ⁶ nLight® network power/relay pack with 0-10V dimming for non-elidoLED drivers (GZ10, GZ1). ER controls fixtures on emergency circuit.
	N80 ⁶ nLight™ Lumen Compensation
	NPS80EZ ⁶ nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1).
	NPS80EZER ⁶ nLight® dimming pack controls 0-10V eldoLED drivers (EZ10, EZ1). ER controls fixtures on emergency circuit.
	HAO ⁹ High ambient option (40°C)
	CP ¹⁰ Chicago Plenum
	WL Wet Location, specify for exterior use applications
	RRL___ RELOC®-ready luminaire connectors enable a simple and consistent factory installed option across all ABL luminaire brands. Refer to RRL for complete nomenclature. Available only in RRLA, RRLB, RRLAE, and RRLC12S.
	NLTAIR2 ^{7,8} nLight® Air enabled
	NLTAIRER2 ^{8,9} nLight® AIR Dimming Pack Wireless Controls. Controls fixtures on emergency circuit
	USPOM US point of manufacture

Notes

- Overall height varies based on lumen package; refer to dimensional chart on page 3.
- Not available with finishes.
- Not available with emergency options.
- Must specify voltage 120V or 277V.
- Available with clear (AR) reflector only.

- Specify voltage. ER for use with generator supply EM power. Will require an emergency hot feed and normal hot feed.
- Fixture begins at 80% light level. Must be specified with NPS80EZ or NPS80EZ ER. Only available with EZ10 and EZ1 drivers.
- Not available with CP, NPS80EZ, NPS80EZER, NPP16D,

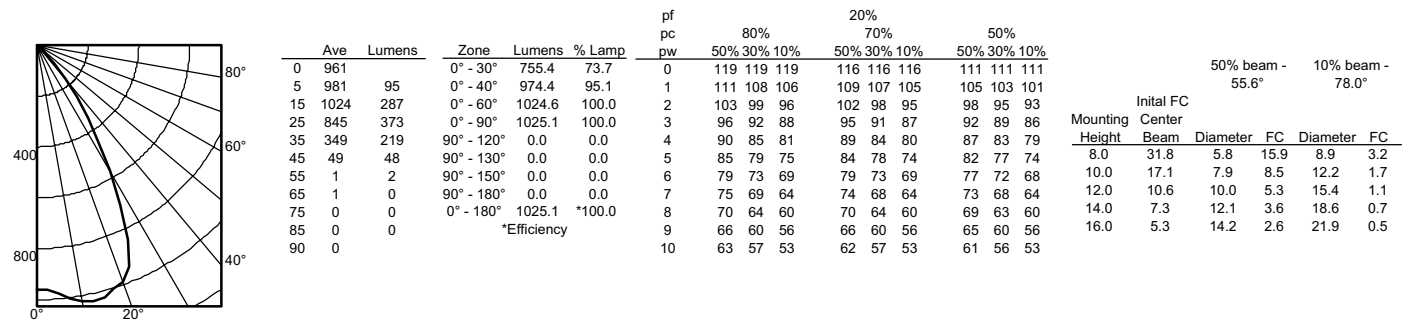
- NPP16DER or N80 options.
- NLTAIR2 and NLTAIRER2 not recommended for metal ceiling installations.
- Fixture height is 5-11/16" for all lumen packages with HAO.
- Must specify voltage for 3000lm. Not available with emergency battery pack option.

LDN4

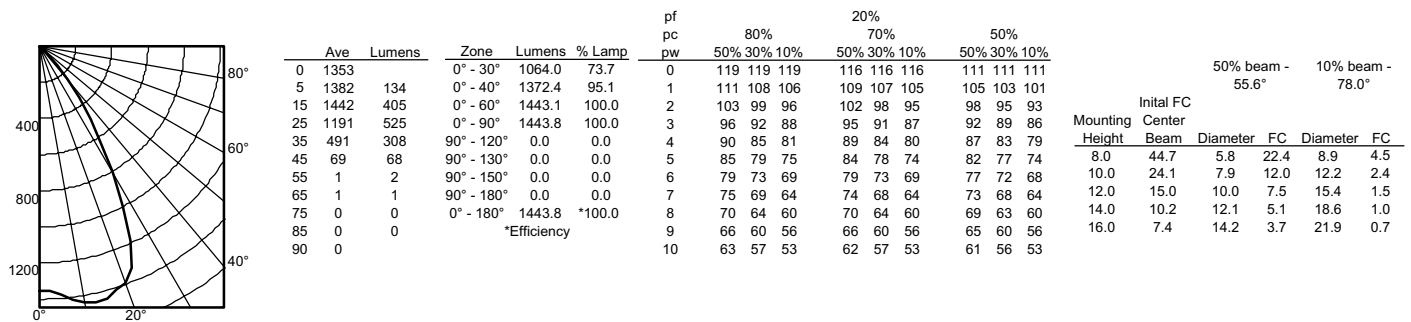
PHOTOMETRY

Distribution Curve	Distribution Data	Output Data	Coefficient of Utilization	Illuminance Data at 30" Above Floor for a Single Luminaire
--------------------	-------------------	-------------	----------------------------	--

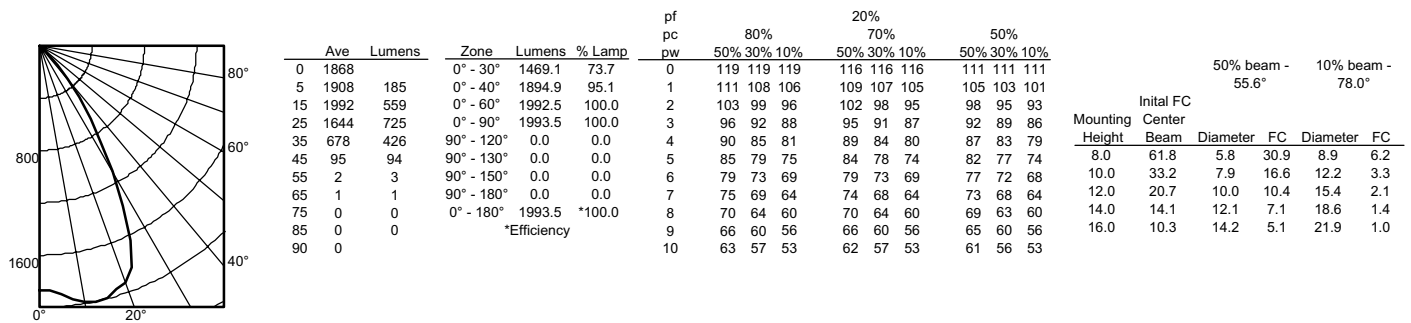
LDN4 35/10 L04AR, input watts: 12.69, delivered lumens: 1025.1, LM/W = 80.78, spacing criterion at 0= 1.04, test no. ISF 30712P31.



LDN4 35/15 L04AR, input watts: 20.44, delivered lumens: 1443.8, LM/W = 70.63, spacing criterion at 0= 1.04, test no. ISF 30712P28.



LDN4 35/20 L04AR, input watts: 22.52, delivered lumens: 1993.5, LM/W = 88.52, spacing criterion at 0= 1.04, test no. ISF 30712P25.



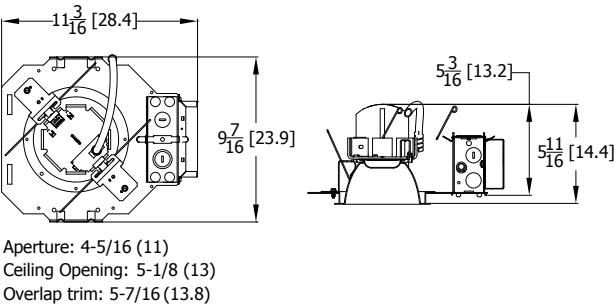
Accessories: Order as separate catalog numbers (shipped separately).

SCA4 Sloped ceiling adapter.
Degree of slope must be specified (5D, 10D, 15D, 20D, 25D, 30D). Refer to [TECH-190](#).

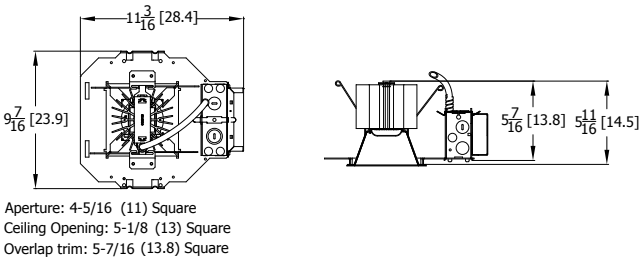
LDN4

* All dimensions are inches (centimeters) unless otherwise noted.

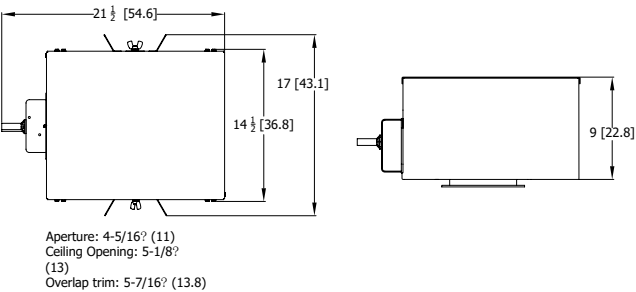
LDN4 500-1500 LUMEN



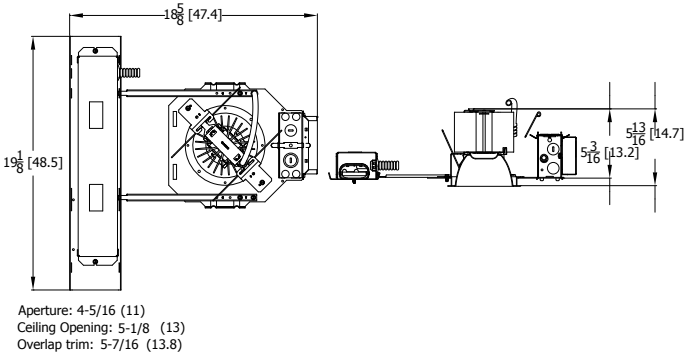
LDN4 2000-3000 LUMEN



LDN4 CP



LDN4 EL-ELR



LDN4			
Target Lumen	Lumens @ 3500K	Wattage	LPW
500	688.8	8.5	80.8
1000	1025.1	12.7	80.7
1500	1443.8	20.4	70.8
2000	1993.5	22.5	88.6
2500	2659.0	30.1	88.3
3000	2860.1	34.8	82.2

HOW TO ESTIMATE DELIVERED LUMENS IN EMERGENCY MODE

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Ouput power of emergency driver. P = 10W for PS1055CP

LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet.

The LPW rating is also available at [Designlight Consortium](#).

LUMEN OUTPUT MULTIPLIERS - CCT					
	2700K	3000K	3500K	4000K	5000K
80CRI	0.950	0.966	1.000	1.025	1.101

LUMEN OUTPUT MULTIPLIERS - FINISH			
	Clear (AR)	White (WR)	Black (BR)
Specular (LS)	1.0	N/A	N/A
Semi-specular (LSS)	0.950	N/A	N/A
Matte diffuse (LD)	0.85	N/A	N/A
Painted	N/A	0.87	0.73

Notes

- Tested in accordance with IESNA LM-79-08.
- Tested to current IES and NEMA standards under stabilized laboratory conditions.
- CRI: 80 typical.

ADDITIONAL DATA

COMPATIBLE 0-10V WALL-MOUNT DIMMERS		
MANUFACTURER	PART NO.	POWER BOOSTER AVAILABLE
Lutron®	Diva® DDTV	
	Diva® DVSCTV	
	Nova T® NTFTV	
	Nova® NFTV	
Leviton®	AWSMT-7DW	CN100
	AWSMG-7DW	PE300
	AMRMG-7DW	
	Leviton Centura Fluorescent Control System	
	IllumaTech® IP7 Series	
Synergy®	ISD BC	RDMFC
	SLD LPCS	
	Digital Equinox (DEQ BC)	
Douglas Lighting Controls	WPC-5721	
Entertainment Technology	Tap Glide TG600FAM120 (120V)	
	Tap Glide Heatsink TGH1500FAM120 (120V)	
	Oasis OA2000FAMU	
Honeywell	EL7315A1019	EL7305A1010 (optional)
	EL7315A1009	
HUNT Dimming	Preset slide: PS-010-IV and PS-010-WH	
	Preset slide: PS-010-3W-IV and PS-010-3W-WH	
	Preset slide, controls FD-010: PS-IFC-010-IV and PS-IFC-010-WH-120/277V	
	Preset slide, controls FD-010: PS-IFC-010-3W-IV and PS-IFC-010-3W-WH-120/277V	
	Remote mounted unit: FD-010	
Lehigh Electronic Products	Solitaire	PBX
PDM Electrical Products	WPC-5721	
Starfield Controls	TR61 with DALI interface port	RT03 DALInet Router
WattStopper®	LS-4 used with LCD-101 and LCD-103	

A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a **shaded background***
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a **shaded background***

To learn more about A+, visit www.acuitybrands.com/aplus.

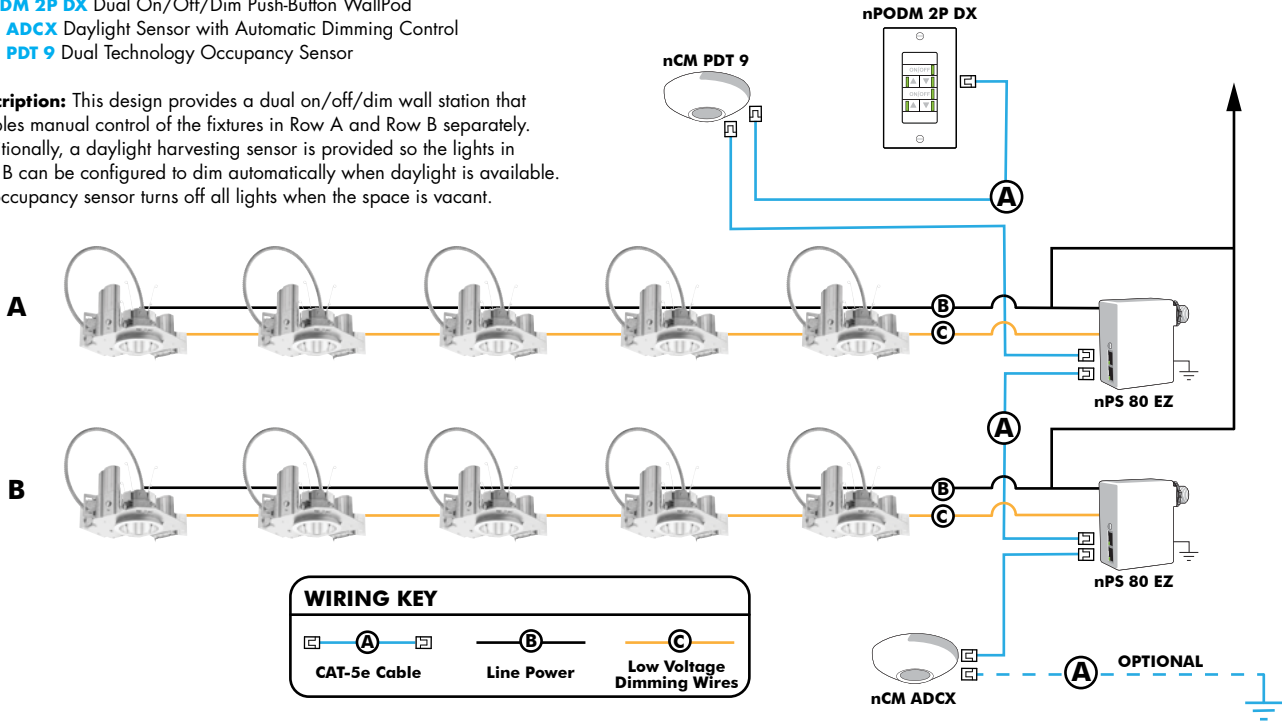
*See ordering tree for details

EXAMPLE

Group Fixture Control*
*Application diagram applies for fixtures with eldoLED drivers only.

- nPS 80 EZ Dimming/Control Pack (qty: 2 required)
- nPODM 2P DX Dual On/Off/Dim Push-Button WallPod
- nCM ADCX Daylight Sensor with Automatic Dimming Control
- nCM PDT 9 Dual Technology Occupancy Sensor

Description: This design provides a dual on/off/dim wall station that enables manual control of the fixtures in Row A and Row B separately. Additionally, a daylight harvesting sensor is provided so the lights in Row B can be configured to dim automatically when daylight is available. An occupancy sensor turns off all lights when the space is vacant.



Choose Wall Controls
nLight offers multiple styles of wall controls - each with varying features and user experience.



Push-Button Wallpod
Traditional tactile buttons and LED user feedback



Graphic Wallpod
Full color touch screen provides a sophisticated look and feel

nLight® Wired Controls Accessories:			
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight for complete listing of nLight controls.			
WallPod Stations	Model number	Occupancy sensors	Model Number
On/Off	nPODM (Color)	Small motion 360°, ceiling (PIR/dual Tech)	nCM 9 / nCM PDT 9
On/Off & Raise/Lower	nPOD DX (Color)	Large motion 360°, ceiling (PIR/dual tech)	nCM 10 / nCM PDT 10
Graphic Touchscreen	nPOD GFX (Color)	Wide View (PIR/dual tech)	nWV 16 / nWV PDT 16
Photocell controls	Model Number	Wall Switch w/ Raise/Lower (PIR/dual tech)	nWSX LV DX / nWSX PDT LV DX
Dimming	nCM ADCX	Cat-5 cables (plenum rated)	Model Number
		10', CAT5 10FT	CAT5 10FT J1
		15, CAT5 15FT	CAT5 15FT J1

nLight AIR

nLight AIR is the ideal solution for retrofit or new construction spaces where adding communication is cost prohibitive. The integrated nLight AIR rPP20 Power Pack is part of each Lithonia LDN Luminaire. These individually addressable controls offer the ultimate in flexibility during initial setup and for space repurposing.



Simple as 1,2,3

1. Install the nLight® AIR fixtures with embedded smart sensor
2. Install the wireless battery-powered wall switch
3. With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome



nLight® AIR Control Accessories:	
Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair .	
Wall switches	Model number
On/Off single pole	rPODB [color]
On/Off two pole	rPODB 2P [color]
On/Off & raise/lower single pole	rPODB DX [color]
On/Off & raise/lower two pole	rPODB 2P DX [color]
On/Off & raise/lower single pole	rPODBZ DX WH ¹

Notes

- 1 Can only be ordered with the RES7Z zone control sensor version.

FEATURES & SPECIFICATIONS

INTENDED USE — The BLT Best-in-Value Low Profile LED luminaire features a popular center basket design that offers a clean, versatile style and volumetric distribution. High efficacy LED light engines deliver energy savings and low maintenance compared to traditional sources. An extensive selection of configurations and options make the BLT the perfect choice for many lighting applications including schools, offices and other commercial spaces, retail, hospitals and healthcare facilities. The low profile BLT design (2-3/4") also makes it an excellent choice for renovation projects.

CONSTRUCTION — BLT enclosure components are die-formed for dimensional consistency and painted after fabrication with a polyester powder paint for improved performance and protection.

The reflector is finished with a high reflective matte white powder paint for improved aesthetics and increased light diffusion.

End plates contain easy-to-position integral T-bar clips for securely attaching the luminaire to the T-grid. For additional T-grid security, optional screw on T-bar clips are available.

Diffusers are extruded from impact modified acrylic for increased durability.

LED boards and drivers are accessible from the plenum.

OPTICS — Volumetric illumination is achieved by creating an optimal mix of light to walls, partitions and vertical and horizontal work surfaces — rendering the interior space, objects and occupants in a more balanced, complimentary luminous environment. High performance extruded acrylic diffusers conceal LEDs and efficiently deliver light in a volumetric distribution. Four diffuser choices available - curved and square designs with linear prisms or a smooth frosted finish.

ELECTRICAL — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. 80% LED lumen maintenance at 60,000 hours (L80/60,000). Color Variation within 3-step MacAdam ellipse (3SDCM).

Non-Configurable BLT: Generic 0-10 volt dimming driver. Dims to 10%

Configurable BLT: available in High Efficiency (HE) versions for applications where a lower wattage (over the standard product) is required. The High Efficiency versions deliver >130 LPW and can be specified via the Lumen Package designations in the Ordering Information below.

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional integrated nLight® controls make each luminaire addressable - allowing them to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Connection to nLight is simple. It can be accomplished with integrated nLight AIR wireless RIO, RES7 sensors, or through standard Cat-5 cabling. nLight offers unique plug-and-play convenience as devices and luminaires automatically discover each other and self-commission. nLight AIR is commissioned easily through an intuitive mobile app.

Lumen Management: Unique lumen management system (option N80) provides on board intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

Step-level dimming option allows system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Driver disconnect provided where required to comply with US and Canadian codes.

SENSOR — Integrated sensor (individual control): Sensor Switch MSD7ADCX ((Passive infrared (PIR)) or MSDPDT7ADCX ((PIR/Microphonics Dual Tech (PDT)) integrated occupancy sensor/automatic dimming photocell allows the luminaire to power off when the space is unoccupied or enough ambient light is entering the space. See page 4 for more details on the integrated sensor.

Integrated Sensor (nLight Wired Networking): This sensor is nLight-enabled, meaning it has the ability to communicate over an nLight network. When wired, using CAT-5 cabling, with other nLight-enabled sensors, power packs, or WallPods, an nLight control zone is created. Once linked to a Gateway, directly or via a Bridge, the zone becomes capable of remote status monitoring and control via SensorView software. See page 4 for the nLight sensor options.

Integrated Smart Sensor (nLight Air Wireless Platform): The RES7 sensor is nLight AIR enabled, meaning it has the ability to communicate over the wireless nLight control platform. It is available with an automatic dimming photocell, and either a digital PIR or microphonics (PDT) dual technology occupancy sensor. It pairs to other luminaires and wall switches through our mobile app, CLARITY, which allows for simple sensor adjustment. See page 4 for more details on the Integrated Smart Sensor.

INSTALLATION — The BLT's low profile design of only 2-3/4" provides increased installation flexibility especially in restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems.

Suitable for damp location.

For recessed mounting in hard ceiling applications, Drywall Grid Adapters (DGA) are available as an accessory. See Accessories section.

LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated.

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Catalog Number
Notes
Type

BLT Series LED

BLT4

1' x 4'
LED



eldoLED

nLight



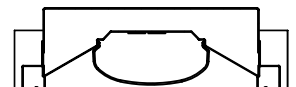
Specifications

Length: 47-3/4 (121.2)

Width: 11-3/4 (29.8)

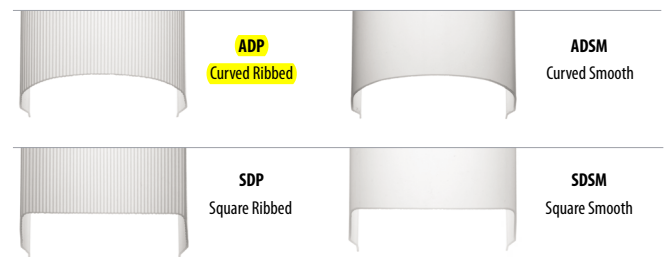
Depth: 2-3/4 (6.9)

Depth with Air supply/return: 3-5/8 (9.2)



All dimensions are inches (centimeters) unless otherwise specified.

Multiple Diffuser Options



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a **shaded background***
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a **shaded background***

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

BLT Volumetric Recessed Lighting 1'x4'



A+ Capable options indicated by this color background.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: BLT4 30L ADP EZ1 LP835

BLT4							
Series	Air function	Lumens ²		Diffuser	Voltage	Driver	Color temperature
BLT4 1x4 BLT	(blank) Static A Air supply/return ¹	Standard efficiency (>100 LPW)	High efficiency^{3,4} (>130 LPW)	ADP Curved, linear prisms ADSM Curved, smooth SDP Square, linear prisms SDSM Square, smooth Includes trim rings to match sensed version ADPT Curved, linear prisms ADSMT Curved, smooth SDPT Square, linear prisms SDSMT Square, smooth	(blank) MVOLT 120 120V 277 277V 347 347V ⁵	EZ1 eldoLED dims to 1% (0-10 volt dimming) GZ1 Dims to 1% (0-10V dimming) ⁶ GZ10 Dims to 10% (0-10V dimming) ⁶ SLD Step-level dimming ⁷	LP830 82CRI, 3000 K LP835 82CRI, 3500 K LP840 82CRI, 4000 K LP850 82CRI, 5000 K LP930 90CRI, 3000K LP935 90CRI, 3500K LP940 90CRI, 4000K LP950 90CRI, 5000K

nLight Interface		Control ¹⁰		Options	
nLight Wired		nLight Wired		Individual Control	
(blank)	no nLight [®] interface	(blank)	No sensor control	MSD7ADCX	PIR integral occupancy sensor with automatic dimming control photocell ¹²
N80	nLight with 80% lumen management	NES7	nLight™ nES 7 PIR integral occupancy sensor ¹¹	MSDPDT7ADCX	PDT integral occupancy sensor with automatic dimming control photocell ¹²
N80EMG	nLight with 80% lumen management For use with generator supply EM power ⁸	NESPDT7	nLight™ nES PDT 7 dual technology integral occupancy control ¹¹		
N100	nLight without lumen management	NES7ADCX	nLight™ nES 7 ADCX PIR integral occupancy sensor with automatic dimming photocell ¹¹		
N100EMG	nLight without lumen management For use with generator supply EM power ⁸	NESPDT7ADCX	nLight™ nES PDT 7 dual technology integral occupancy sensor with automatic dimming photocell ¹¹		
nLight Wireless		nLight Wireless			
(blank)	no nLight [®] interface	RES7	nLight AIR PIR integral occupancy sensor with automatic dimming photocell ¹		
NLTAIR2	nLight AIR Generation 2 enabled ⁹	RES7PDT	nLight AIR microphonics dual technology occupancy sensor with automatic dimming photocell		
		RIO	nLight AIR radio module without sensor		
				EL7L	700 lumen battery pack (non-CEC compliant) ¹³
				EL14L	1400 lumen battery pack (non-CEC compliant) ¹³
				EL14LSD	1400 lumen battery pack with self-diagnostic testing feature (non-CEC compliant) ^{13,14}
				E10WLCP	EM Self-Diagnostic battery pack, 10W Constant Power, CEC compliant ¹³
				CP	Chicago plenum ¹⁵
				BGTD	Bodine Generator Transfer Device ¹⁶
				PWS1836	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit
				PWS1846	6' pre-wire, 3/8" diameter, 18 gauge, 2 circuit
				PWS1846 PWSLV	Two cables: one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, purple and gray ¹⁷
				PWS1856LV	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit w/ low voltage purple and grey wires ¹⁷
				GLR	Fast-blowing fuse ¹⁸
				GMF	Slow-blowing fuse ¹⁸
				NPLT	Narrow pallet
				RRL_	RELOC [®] -ready luminaire ¹⁹
				LATC	Earthquake clip
				DWAM	Anti-Microbial paint
				IP5X	Gasketed diffuser compartment to meet IP5X rating ²⁰

Non-Configurable BLT								
Stock/MTO	Catalog Description *	UPC	Lumens	Wattage	LPW	Color Temperature	Voltage	Pallet Qty
Stock	BLT4 40L ADP LP835	00190887466218	4114	32	129	3500K/82 CRI	120-277	39
	BLT4 40L ADP LP840	00190887465228	4180	32	131	4000K/82 CRI	120-277	39
	BLT4 40L ADP EL14L LP835	00190887466621	4114	32	129	3500K/82 CRI	120-277	39
	BLT4 40L ADP EL14L LP840	00190887466614	4180	32	131	4000K/82 CRI	120-277	39
MTO	BLT4 40L ADP 347 LP835		4114	32	129	3500K/82 CRI	347	39
	BLT4 40L ADP 347 LP840		4180	32	131	4000K/82CRI	347	39

*Generic 0-10V Dimming to 10%.

Notes and Accessories next page

BLT Volumetric Recessed Lighting 1'x4'

Notes

- 1

Consult factory for airflow data.
- 2

Approximate lumen output.
- 3

All versions may not achieve 130+ LPW. Refer to photometry on www.acuitybrands.com.
- 4

Air supply/return option, 90 CRI, and versions with integral sensor trim rings may not achieve 130 LPW.
- 5

Not available with SLD EL7L, or EL14L options.
- 6

GZ1 and GZ10 not available with Control or Sensor options.
- 7

Not available with N80, N80EMG, N100, N100EMG, NLTAIR2, or occupancy control.
- 8

nLight EMG option requires a connection to existing nLight network. Power is provided from a separate N80 or N100 enabled fixture.
- 9

Must order with RES7, RESPDT7, or RIO module. Only available with EZ1 driver.
- 10

Must specify diffuser with trim rings. See sensor options on page 4.
- 11

Requires N80, N80EMG, N100, or N100EMG.
- 12

Only available with EZ1 driver option. 0-10v dimming wires not accessible via access plate.
- 13

When using pre-wire option, use PWS1846 or PWS1846 PWSLV.
- 14

For more information, please see the [PSSD2 specification sheet](#).
- 15

Not available with N80, N80EMG, N100, or N100EMG.
- 16

Must specify voltage. Requires BSE labeling, voltage specific. Consult factory for options.
- 17

Not available with nLight wired/wireless network or individual controls.
- 18

Must specify voltage, 120 or 277, with GLR and GFM fusing.
- 19

For ordering logic consult [RRL_2013](#).
- 20

Not available with air supply/return or Wired Networking (NES_) and Individual Control (MSD_) sensors.

Accessories: Order as separate catalog number.	
DGA14	Drywall grid adapter for 1x4 recessed fixture
1X4SMK	Surface Mount Troffer Kit

nLight® Wired Control Accessories: Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlight .			
WallPod stations	Model number	Occupancy sensors	Model number
On/Off	nPODM [color]	Small motion 360°, ceiling (PIR / dual tech)	nCM 9 RJB / nCM PDT 9 RJB
On/Off & raise/lower	nPODM DX [color]	Large motion 360°, ceiling (PIR / dual tech)	nCM10 RJB / nCM PDT 10 RJB
Graphic touchscreen	nPOD GFX [color]	Wall switch with raise/lower	nWSX PDT LV DX [color]
Photocell controls	Model number	Cat-5 cable (plenum rated)	Model number
Full range dimming	nCM ADCX RJB	10' cable	CAT5 10FT J1
		30' cable	CAT5 30FT J1

nLight® AIR Control Accessories: Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair .	
Wall switches	Model number
On/Off single pole	rPODB [color] G2
On/Off two pole	rPODB 2P [color] G2
On/Off & raise/lower single pole	rPODB DX [color] G2
On/Off & raise/lower two pole	rPODB 2P DX [color] G2
On/Off & raise/lower single pole	rPODBZ DX WH G2

rCMS¹										Example: RCMS PDT 10 AR G2	
Series / Detection		Power Supply¹		Occupancy Detection		Lens (Required)		Operating Mode		Generation	
RCMS	nLight AIR occupancy and daylight sensor	[blank]	Power Supply ordered separately	[blank] PDT	PIR Detection Dual Tech PIR/ Microphonics	10	Large Motion/ Extended Range 360°	[BLANK] AR	None Auxiliary Relay	G2	Generation 2 compatibility
		PS 150	Standard 150 mA Power Supply			9	Small Motion/ Extended Range 360°				
						6	High Bay 360° Lens				

Replacement Parts: Order as separate catalog number.		
*249P36	DBLT48 ADP LENS ASSEMBLY	4 ft. replacement lens
*249P3C	DBLT48 SDP LENS ASSEMBLY	4 ft. replacement lens
*249P3H	DBLT48 ADSM LENS ASSEMBLY	4 ft. replacement lens
*249P3L	DBLT48 SDSM LENS ASSEMBLY	4 ft. replacement lens
*239UJR	DBLT48 ADPT LENS ASSEMBLY	4 ft. replacement lens
*239TXC	DBLT48 SDPT LENS ASSEMBLY	4 ft. replacement lens
*239UK6	DBLT48 ADSMT LENS ASSEMBLY	4 ft. replacement lens
*239UK6	DBLT48 SDSMT LENS ASSEMBLY	4 ft. replacement lens
*239TVV	DBLT48 ADPT SENSOR LENS ASSEMBLY	4 ft. replacement lens
*239TXM	DBLT48 SDPT SENSOR LENS ASSEMBLY	4 ft. replacement lens
*239UKG	DBLT48 ADSMT SENSOR LENS ASSEMBLY	4 ft. replacement lens
*239UOK	DBLT48 SDSMT SENSOR LENS ASSEMBLY	4 ft. replacement lens

Notes

- 1

RCMS requires low voltage power from either RPP20 DS 24V G2 or PS150.



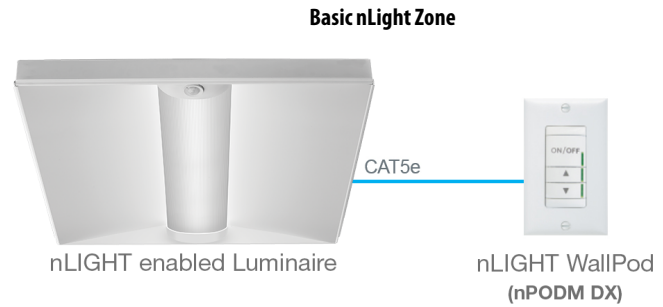
BLT Volumetric Recessed Lighting 1'x4'

Sensor Options					
Option	Automatic Dimming Photocell	Occupancy Sensing		nLight Wired Networking	nLight AIR Networking
		PIR	PDT		
MSD7ADCX	X	X			
MSDPDT7ADCX	X		X		
NES7		X		X	
NES7ADCX	X	X		X	
NESPDT7			X	X	
NESPDT7ADCX	X		X	X	
RES7	X	X			X
RESPDT7	X	X	X		X

Integrated Sensor with Individual Control

The MSD7ADCX PIR occupancy sensor/automatic dimming photocell is ideal for areas without obstructions and where daylight harvesting may be desired. Suggested applications include, but not limited to, hallways, corridors, storage rooms, and breakrooms or other areas where people are typically moving.

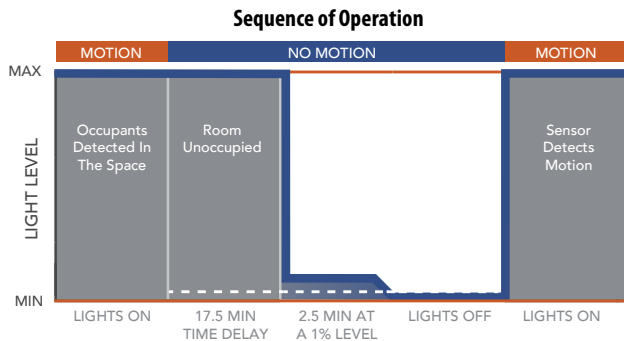
The MSDPDT7ADCX PIR/Microphonics Dual Tech occupancy sensor/automatic dimming photocell is ideal for areas with obstructions and where daylight harvesting is desired. Suggested applications include, but not limited to, open offices, private offices, classrooms, public restrooms, and conference rooms.



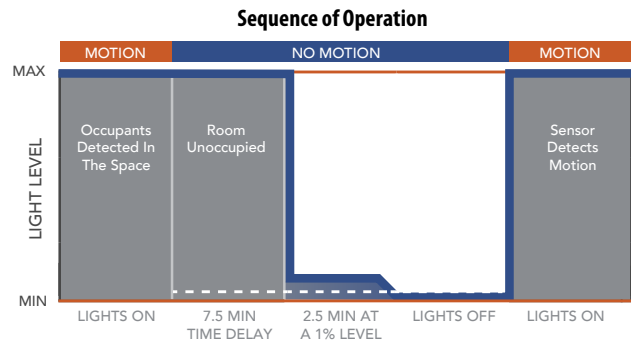
nLight Wired Networking

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion. Ideal areas include hallways, corridors, storage rooms, and breakrooms. Additionally, the NES7ADCX includes an integrated photocell, which enables daylight harvesting controls.

For areas like restrooms, private offices, open offices, conference rooms or any space with obstructions, the nES PDT 7 dual technology sensor is recommended. The nES PDT 7 utilizes both PIR (passive infrared) and Microphonics technologies to detect occupancy. Additionally, the NESPDT7ADCX includes an integrated photocell, which enables daylight harvesting controls which is ideal for areas where windows are present.



*The presetting on the automatic dimming photocell is 5fc.

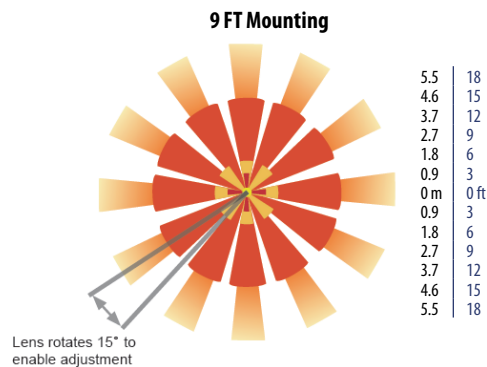


*The presetting on the automatic dimming photocell is 5fc.

Sensor Coverage Pattern

Mini 360° Lens

- Recommended for walking motion detection from mounting heights between 8 ft (2.44 m) and 20 ft (6.10 m)
- Initial detection of walking motion along sensor axes at distances of 2x the mounting height up to 15 ft (4.57 m) and
- 1.75x up to 20 ft (6.10 m).
- Provides 12 ft (3.66 m) radial detection of small motion when mounted at 9 ft (2.74 m)
- Initial detection will occur earlier when walking across sensor's field of view than when walking directly at sensor



nLight AIR Wireless

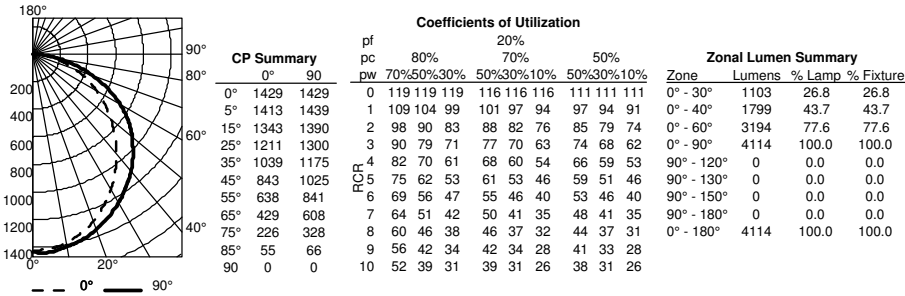
nLight AIR is the ideal solution for retrofit or new construction spaces where adding additional wiring can be labor intensive and costly. nLight AIR is available with or without and integral sensor. The integrated RES7 or RES7PDT smart sensor is part of each luminaire in the nLight AIR network, which can be grouped to control multiple luminaires. The granularity of control with the digital PIR occupancy detection and daylight sensing makes a great solution for any application.



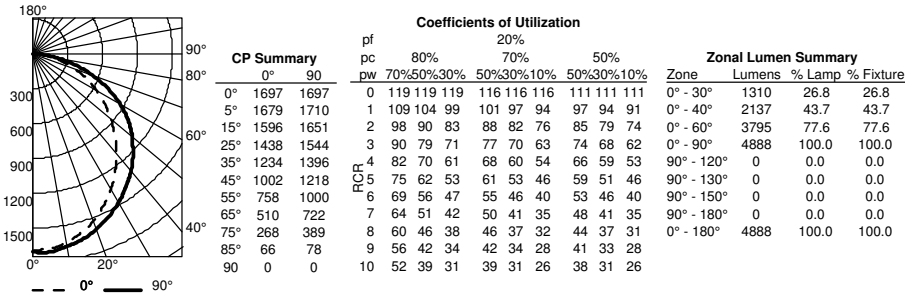
BLT Volumetric Recessed Lighting 1'x4'

PHOTOMETRICS

BLT4 40L ADP LP835, 4114 delivered lumens, test no. ISF35685P49, tested in accordance to IESNA LM-79

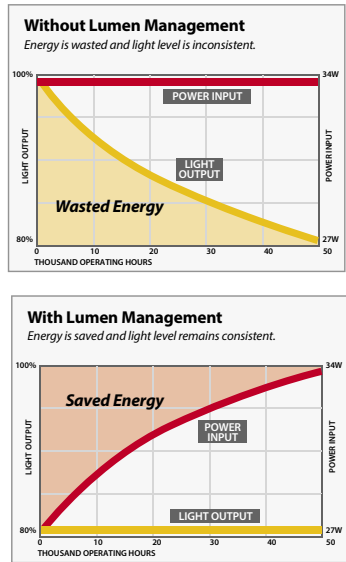


BLT4 48L ADP LP835, 4888 delivered lumens, test no. ISF35685P114, tested in accordance to IESNA LM-79

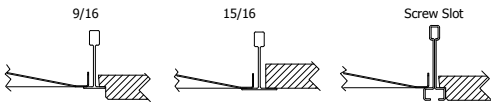


Constant Lumen Management

Enabled by the embedded nLight control, the BLT actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



MOUNTING DATA	
Ceiling Type	Appropriate Trim Type
Exposed grid tee (1' and 9/16")	G
Concealed grid tee	G
Plaster or plasterboard	G*



*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 12-3/4" x 48-3/4" (Tolerance is +1/8", -0").

How to Estimate Delivered Lumens in Emergency Mode

Use the formula below to estimate the delivered lumens in emergency mode

Delivered Lumens = 1.25 x P x LPW

P = Output power of emergency driver. P = 10W for E10WLCP option.

LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet. LPW = Lumen per watt rating of the luminaire. LPW information available in Performance Data section.

BLT Volumetric Recessed Lighting 1'x4'

Performance Data					
Model Number	Lumens	LPW	Watts	DLC Listing	DLC ID
BLT4 15L ADP EZ1 (GZ1, GZ10) LP840[All Options]	1450.79	123.83	11.71	Premium	PITJ7LZR
BLT4 15L ADPT EZ1 (GZ1, GZ10) LP840[All Options]	1429.13	121.98	11.71	standard	PGT9ZM85
BLT4 20L ADP EZ1 (GZ1, GZ10) LP835 [All Options]	1907	124.24	15.34	Premium	P6TRMV97
BLT4 20L ADP EZ1 (GZ1, GZ10) LP840 [All Options]	1937.44	126.22	15.34	Premium	PYGYBGA4
BLT4 20L ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	1908.51	124.34	15.34	Premium	P62XJ7B5
BLT4 20L ADPT EZ1 (GZ10) LP835 [All Options]	1878.52	126.92	14.8	Premium	PSDPC339
BLT4 20L ADPT GZ1 LP835 [All Options]	1878.52	122.38	15.34	standard	PCPS6AYF
BLT4 30L ADP EZ1 (GZ1, GZ10) LP835 [All Options]	2918	125.97	23.16	Premium	PFTQCVDN
BLT4 30L ADP EZ1 (GZ1, GZ10) LP840 [All Options]	2964.58	127.98	23.16	Premium	PXYBVAFH
BLT4 30L ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	2874.42	124.08	23.16	Premium	PQB9V6BJ
BLT4 30L ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	2920.31	126.07	23.16	Premium	P8UXM7NX
BLT4 40L ADP EZ1 (GZ1, GZ10) LP835 [All Options]	4114	124.31	33.09	Premium	PMYRQ49V
BLT4 40L ADP EZ1 (GZ1, GZ10) LP840 [All Options]	4179.68	126.3	33.09	Premium	PGGU8V31
BLT4 40L ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	4117.26	124.41	33.09	Premium	PUEDT9VY
BLT4 40L ADPT EZ1 (GZ10) LP835 [All Options]	4052.56	124.84	32.46	Premium	P42QKXVC
BLT4 40L ADPT GZ1 LP835 [All Options]	4052.56	122.46	33.09	standard	PI8CCBNK
BLT4 48L ADP EZ1 (GZ1, GZ10) LP835 [All Options]	4888	124.02	39.41	Premium	PYZ4KMD4
BLT4 48L ADP EZ1 (GZ1, GZ10) LP840 [All Options]	4966.03	126	39.41	Premium	PQX799PT
BLT4 48L ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	4891.88	124.12	39.41	Premium	PNTGHKEN
BLT4 48L ADPT EZ1 (GZ10) LP835 [All Options]	4815	124.32	38.73	Premium	P22X8T1X
BLT4 48L ADPT GZ1 LP835 [All Options]	4815	122.17	39.41	standard	PJR9QMWQ
BLT4 60L ADP EZ1 (GZ1, GZ10) LP840 [All Options]	6133.38	124.58	49.23	Premium	P2DSW9MV
BLT4 60L ADP EZ1 (GZ10) LP835 [All Options]	6037	124.98	48.3	Premium	PWMC3RXH
BLT4 60L ADP GZ1 LP835 [All Options]	6037	122.62	49.23	standard	PIBQT145
BLT4 60L ADPT EZ1 (GZ10) LP835 [All Options]	5946.85	123.12	48.3	standard	P7JXFEX8
BLT4 60L ADPT EZ1 (GZ10) LP840 [All Options]	6041.79	125.08	48.3	Premium	PJZS4XAG
BLT4 60L ADPT GZ1 LP835 [All Options]	5946.85	120.79	49.23	standard	P43IPTQT
BLT4 60L ADPT GZ1 LP840 [All Options]	6041.79	122.72	49.23	standard	PBR3M7AA

DLC information is subject to change, for the most up-to-date information please refer to www.dlc.org. Above listings do not cover 347v or SLD.

HE Performance Data					
Model Number	Lumens	LPW	Watts	DLC Listing	DLC ID
BLT4 15LHE ADP EZ1 (GZ1, GZ10) LP835[All Options]	1486	127.29	11.67	Premium	PTAG2QWR
BLT4 15LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	1509.72	129.32	11.67	Premium	PW6HZMN4
BLT4 15LHE ADPT EZ1 (GZ1, GZ10) LP835[All Options]	1463.8	125.39	11.67	Premium	PM80L4KU
BLT4 15LHE ADPT EZ1 (GZ1, GZ10) LP840[All Options]	1487.17	127.39	11.67	Premium	P3SW8CVO
BLT4 20LHE ADP EZ1 (GZ1, GZ10) LP835 [All Options]	1920	126.59	15.16	Premium	PPE50BKI
BLT4 20LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	1950.65	128.61	15.16	Premium	PNVCY7R2
BLT4 20LHE ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	1891.32	124.7	15.16	Premium	PH4BQPK3
BLT4 20LHE ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	1921.52	126.69	15.16	Premium	PX3ZLUGW
BLT4 30LHE ADP EZ1 (GZ1, GZ10) LP835 [All Options]	2987	136.62	21.86	Premium	PVOLKMTV
BLT4 30LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	3034.68	138.8	21.86	Premium	PQS60MWX
BLT4 30LHE ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	2942.39	134.58	21.86	Premium	P0YU2QG4
BLT4 30LHE ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	2989.37	136.73	21.86	Premium	P7IA04ZL
BLT4 40LHE ADP EZ1 (GZ1, GZ10) LP835 [All Options]	4193	137.85	30.41	Premium	PTFZPNFT
BLT4 40LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	4259.94	140.05	30.41	Premium	PU2IGL4P
BLT4 40LHE ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	4130.38	135.79	30.41	Premium	PHHEA92E
BLT4 40LHE ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	4196.32	137.96	30.41	Premium	PPVTSJFT
BLT4 48LHE ADP EZ1 (GZ1, GZ10) LP835 [All Options]	4667	133.48	34.96	Premium	PJT47YU5
BLT4 48LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	4741.5	135.61	34.96	Premium	PX9KVB3
BLT4 48LHE ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	4597.3	131.49	34.96	Premium	PBQR558K
BLT4 48LHE ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	4670.7	133.59	34.96	Premium	PRTND692
BLT4 60LHE ADP EZ1 (GZ1, GZ10) LP835 [All Options]	5914	130.91	45.17	Premium	PD35F8SD
BLT4 60LHE ADP EZ1 (GZ1, GZ10) LP840 [All Options]	6008.41	133	45.17	Premium	PYKY93GZ
BLT4 60LHE ADPT EZ1 (GZ1, GZ10) LP835 [All Options]	5825.68	128.95	45.17	Premium	PM297Q4P
BLT4 60LHE ADPT EZ1 (GZ1, GZ10) LP840 [All Options]	5918.69	131.01	45.17	Premium	PSB3FUK4

DLC information is subject to change, for the most up-to-date information please refer to www.dlc.org. Above listings do not cover 347v or SLD.

FEATURES & SPECIFICATIONS

INTENDED USE — The BLT Best-in-Value Low Profile LED luminaire features a popular center basket design that offers a clean, versatile style and volumetric distribution. High efficacy LED light engines deliver energy savings and low maintenance compared to traditional sources. An extensive selection of configurations and options make the BLT the perfect choice for many lighting applications including schools, offices and other commercial spaces, retail, hospitals and healthcare facilities. The low profile BLT design (2-3/4") also makes it an excellent choice for renovation projects.

CONSTRUCTION — BLT enclosure components are die-formed for dimensional consistency and painted after fabrication with a polyester powder paint for improved performance and protection.

The reflector is finished with a high reflective matte white powder paint for improved aesthetics and increased light diffusion.

End plates contain easy-to-position integral T-bar clips for securely attaching the luminaire to the T-grid. For additional T-grid security, optional screw on T-bar clips are available.

Diffusers are extruded from impact modified acrylic for increased durability.

LED boards and drivers are accessible from the plenum.

OPTICS — Volumetric illumination is achieved by creating an optimal mix of light to walls, partitions and vertical and horizontal work surfaces — rendering the interior space, objects and occupants in a more balanced, complimentary luminous environment. High performance extruded acrylic diffusers conceal LEDs and efficiently deliver light in a volumetric distribution. Four diffuser choices available - curved and square designs with linear prisms or a smooth frosted finish.

ELECTRICAL — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. 80% LED lumen maintenance at 60,000 hours (L80/60,000). Color Variation within 3-step MacAdam ellipse (3SDCM).

The BLT series is available in High Efficiency (HE) versions for applications where a lower wattage (over the standard product) is required. The High Efficiency versions deliver >130 LPW and can be specified via the Lumen Package designations in the Ordering Information below.

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional integrated nLight® controls make each luminaire addressable - allowing them to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocells. Simply connect all the nLight enabled control devices and the BLT luminaires using standard Cat-5 cabling. Unique plug-and-play convenience as devices and luminaires automatically discover each other and self-commission.

Lumen Management: Unique lumen management system (option N80) provides on board intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

Step-level dimming option allows system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Driver disconnect provided where required to comply with US and Canadian codes.

SENSOR — **Integrated sensor (individual control):** Sensor Switch MSD7ADCX ((Passive infrared (PIR)) or MSDPDT7ADCX ((PIR/Microphonics Dual Tech (PDT)) integrated occupancy sensor/automatic dimming photocell allows the luminaire to power off when the space is unoccupied or enough ambient light is entering the space. See page 2 for more details on the integrated sensor.

Integrated Sensor (nLight Wired Networking): This sensor is nLight-enabled, meaning it has the ability to communicate over an nLight network. When wired, using CAT-5 cabling, with other nLight-enabled sensors, power packs, or WallPods, an nLight control zone is created. Once linked to a Gateway, directly or via a Bridge, the zone becomes capable of remote status monitoring and control via SensorView software. See page 2 for the nLight sensor options.

INSTALLATION — The BLT's low profile design of only 2-3/4" provides increased installation flexibility especially in restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems.

Suitable for damp location.

For recessed mounting in hard ceiling applications, Drywall Grid Adapters (DGA) are available as an accessory. See Accessories section.

LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Catalog Number
Notes
Type

BLT Series LED



BLT

1' x 2'
LED



eldoLED



Specifications

Length: 23-3/4 (60.3)

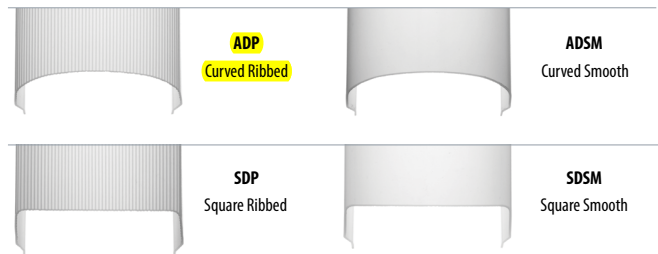
Width: 11-3/4 (29.8)

Depth: 2-3/4 (6.9)



All dimensions are inches (centimeters) unless otherwise specified.

Multiple Diffuser Options



CSA+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a shaded background*
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

BLT Volumetric Recessed Lighting 1'x2'



A+ Capable options indicated by this color background.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: BLT2 20L ADP GZ10 LP835

BLT2							
Series	Air function	Lumens ¹		Diffuser	Voltage	Driver	Color temperature
BLT2 1X2 BLT	(blank) Static	Standard efficiency (>100 LPW)	High Efficiency (>130 LPW)	ADP Curved, linear prisms	(blank) MVOLT	EZ1 eldoLED dims to 1% (0-10v dimming)	LP830 82CRI, 3000K
		10L 1000	40LHE 4000	ADSM Curved, smooth	347 347 ²	GZ1 Dims to 1% (0-10V dimming) ³	LP835 82CRI, 3500 K
		15L 1500		SDP Square, linear prisms		GZ10 Dims to 10% (0-10V dimming) ³	LP840 82CRI, 4000 K
		20L 2000		SDSM Square, smooth		SLD Step-level dimming ⁴	LP850 82CRI, 5000 K
		30L 3000		Includes trim rings to match sensed version			LP930 90CRI, 3000K
		40L 4000		ADPT Curved, linear prisms			LP935 90CRI, 3500K
				ADSMT Curved, smooth			LP940 90CRI, 4000K
				SDPT Square, linear prisms			LP950 90CRI, 5000K
				SDSMT Square, smooth			

Controls		Occupancy Control ⁶		Options	
(blank)	No nLight®	(blank)	No sensor control	EL7L	700 lumen battery pack (Non-CEC Compliant) ⁹
N80	nLight® with 80% lumen management		nLight Wired Networking	EL14L	1400 lumen battery pack (Non-CEC compliant) ⁹
N80EMG	nLight® with 80% lumen management For use with generator supply EM power ⁵	NES7	nLight™ nES 7 PIR integral occupancy sensor ⁷	E10WLCP	EM Self-Diagnostic battery pack, 10W Constant Power, CEC compliant
N100	nLight® without lumen management	NESPD7	nLight™ nES PDT 7 dual technology integral occupancy control ⁶	CP	Chicago plenum
N100EMG	nLight® without lumen management For use with generator supply EM power ⁵	NES7ADCX	nLight™ nES 7 ADCX PIR integral occupancy sensor with automatic dimming photocell ⁷	BGTD	Bodine Generator Transfer Device ¹⁰
		NESPD7ADCX	nLight™ nES PDT 7 dual technology integral occupancy sensor with automatic dimming photocell ⁷	PWS1836	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit
				PWS1846	6' pre-wire, 3/8" diameter, 18 gauge, 2 circuit
				PWS1846 PWSLV	Two cables: one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, purple and gray ¹¹
				PWS1856LV	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit w/low voltage purple and grey wires ¹¹
				GLR	Fast-blowing fuse ¹²
				GMF	Slow-blowing fuse ¹²
				NPLT	Narrow pallet
				RRL_	RELOC®-ready luminaire ¹³
				LATC	Earthquake clip
				DWAM	Anti-Microbial paint

Accessories next page

Notes

- 1 Approximate lumen output.
- 2 Not available with SLD, EL7L or EL14L battery packs.
- 3 GZ1, GZ10 drivers not available with any Controls or sensor options.
- 4 Not available with N80, N80EMG, N100, N100EMG or occupancy control.
- 5 nLight EMG option requires a connection to existing nLight network. Power is provided from a separate N80 or N100 enabled fixture.
- 6 Must specify diffuser with trims rings. See sensor options on page 3.
- 7 Requires N80, N80EMG, N100, or N100EMG.
- 8 Only available with EZ1 driver option. 0-10v dimming wires not accessible via access plate.
- 9 When using pre-wire option, use PWS1846 or PWS1846 PWSLV.
- 10 Must specify voltage. Requires BSE labeling, voltage specific. Consult factory for options.
- 11 Not available with nLIGHT wired network or individual controls.
- 12 Must specify voltage, 120 or 277, with GLR and GMF fusing and BGTD.
- 13 For ordering logic consult: [RRL_2013](#).

BLT Volumetric Recessed Lighting 1'x2'

Accessories: Order as separate catalog number.

DGA12 Drywall grid adapter for 1x2 recessed fixture

nLight® Control Accessories:

Order as separate catalog number. Visit <http://www.acuitybrands.com/products/controls/nlight>.

WallPod stations	Model number	Occupancy sensors	Model number
On/Off	nPODM [color]	Small motion 360°, ceiling (PIR / dual tech)	nCM 9 RJB / nCM PDT 9 RJB
On/Off & raise/lower	nPODM DX [color]	Large motion 360°, ceiling (PIR / dual tech)	nCM10 RJB / nCM PDT 10 RJB
Graphic touchscreen	nPOD GFX [color]	Wall switch with raise/lower	nWSX PDT LV DX [color]
Photocell controls	Model number	Cat-5 cable (plenum rated)	Model number
Full range dimming	nCM ADCX RJB	10' cable	CAT5 10FT J1
		30' cable	CAT5 30FT J1

Replacement Parts: Order as separate catalog number.

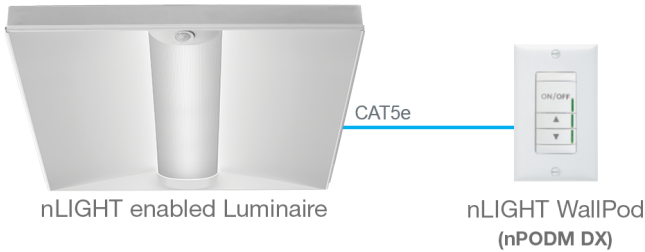
*249P34	DBLT24 ADP LENS ASSEMBLY	2 ft. replacement lens
*249P3A	DBLT24 SDP LENS ASSEMBLY	2 ft. replacement lens
*249P3F	DBLT24 ADSM LENS ASSEMBLY	2 ft. replacement lens
*249P3K	DBLT24 SDSM LENS ASSEMBLY	2 ft. replacement lens
*239UMP	DBLT24 ADPT LENS ASSEMBLY	2 ft. replacement lens
*239UMV	DBLT24 SDPT LENS ASSEMBLY	2 ft. replacement lens
*239UMX	DBLT24 ADSMT LENS ASSEMBLY	2 ft. replacement lens
*239UN0	DBLT24 SDSMT LENS ASSEMBLY	2 ft. replacement lens
*239HYG	DBLT24 ADPT SENSOR LENS ASSEMBLY	2 ft. replacement lens
*239HYH	DBLT24 SDPT SENSOR LENS ASSEMBLY	2 ft. replacement lens
*239UNE	DBLT24 ADSMT SENSOR LENS ASSEMBLY	2 ft. replacement lens
*239TY2	DBLT24 SDSMT SENSOR LENS ASSEMBLY	2 ft. replacement lens

BLT Volumetric Recessed Lighting 1'x2'

Sensor Options				
Option	Automatic Dimming Photocell	Occupancy Sensing		nLight Wired Networking
		PIR	PDT	
MSD7ADCX	X	X		
MSDPDT7ADCX	X		X	
NES7		X		X
NES7ADCX	X	X		X
NESPDT7			X	X
NESPDT7ADCX	X		X	X



Basic nLight Zone



Integrated Sensor with Individual Control

The MSD7ADCX PIR occupancy sensor/automatic dimming photocell is ideal for areas without obstructions and where daylight harvesting may be desired. Suggested applications include, but not limited to, hallways, corridors, storage rooms, and breakrooms or other areas where people are typically moving.

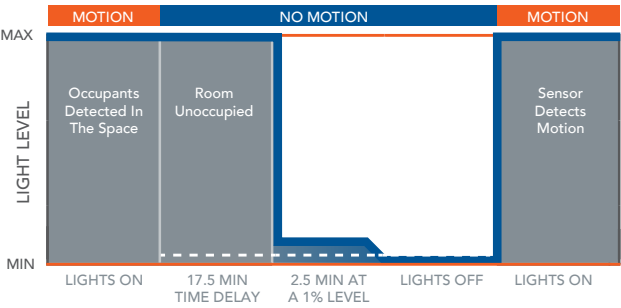
The MSDPDT7ADCX PIR/Microphonics Dual Tech occupancy sensor/automatic dimming photocell is ideal for areas with obstructions and where daylight harvesting is desired. Suggested applications include, but not limited to, open offices, private offices, classrooms, public restrooms, and conference rooms.

nLight Wired Networking

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion. Ideal areas include hallways, corridors, storage rooms, and breakrooms. Additionally, the NES7ADCX includes an integrated photocell, which enables daylight harvesting controls.

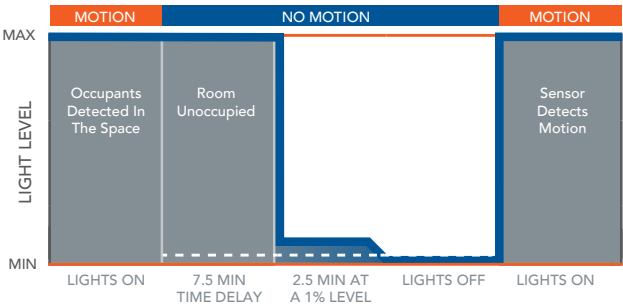
For areas like restrooms, private offices, open offices, conference rooms or any space with obstructions, the nES PDT 7 dual technology sensor is recommended. The nES PDT 7 utilizes both PIR (passive infrared) and Microphonics technologies to detect occupancy. Additionally, the NESPDT7ADCX includes an integrated photocell, which enables daylight harvesting controls which is ideal for areas where windows are present.

Sequence of Operation



*The presetting on the automatic dimming photocell is 5fc.

Sequence of Operation

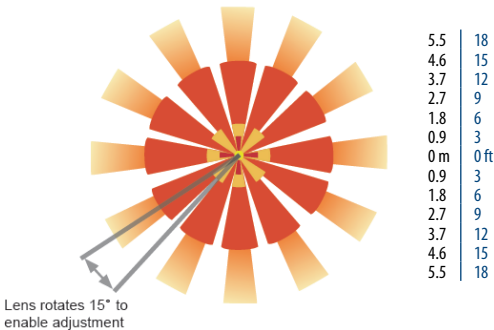


*The presetting on the automatic dimming photocell is 5fc.

Sensor Coverage Pattern Mini 360° Lens

- Recommended for walking motion detection from mounting heights between 8 ft (2.44 m) and 20 ft (6.10 m)
- Initial detection of walking motion along sensor axes at distances of 2x the mounting height up to 15 ft (4.57 m) and 1.75x up to 20 ft (6.10 m).
- Provides 12 ft (3.66 m) radial detection of small motion when mounted at 9 ft (2.74 m)
- Initial detection will occur earlier when walking across sensor's field of view than when walking directly at sensor

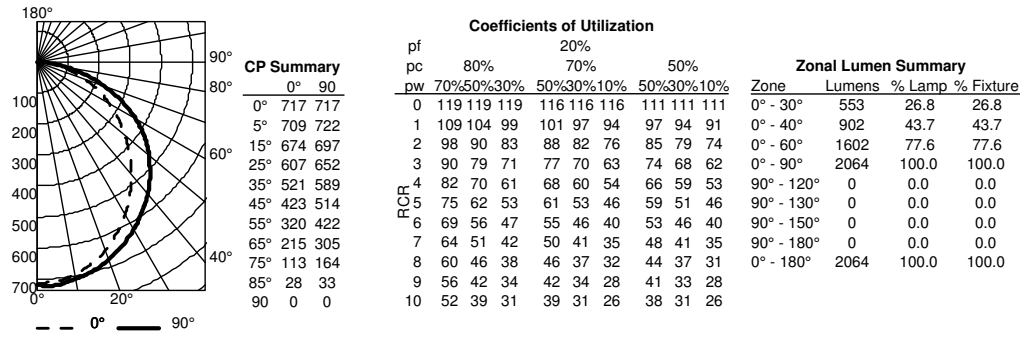
9 FT Mounting



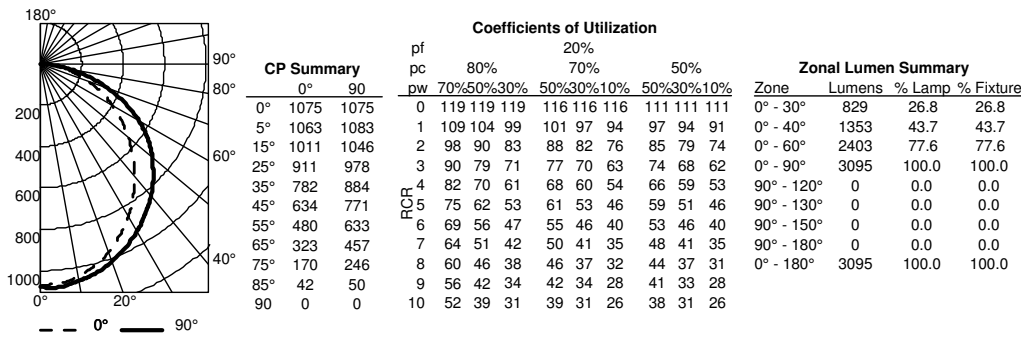
BLT Volumetric Recessed Lighting 1'x2'

PHOTOMETRICS

BLT2 20L ADP LP835, 2064 delivered lumens, test no. ISF35685P19, tested in accordance to IESNA LM-79

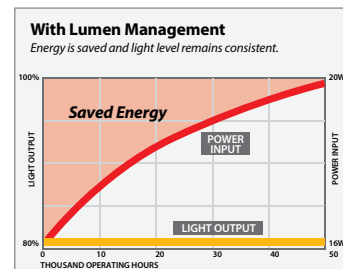
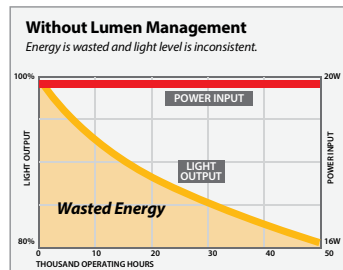


BLT2 30L ADP L835, 3095 delivered lumens, test no. ISF35685P27, tested in accordance to IESNA LM-79



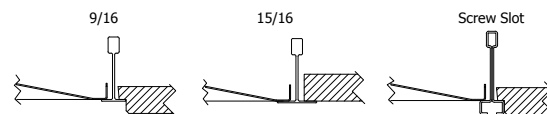
Constant Lumen Management

Enabled by the embedded nLight control, the BLT actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



Performance Data			
Lumen Package	Lumens	Input Watts	LPW
10L ADP LP830	985	8	123
10L ADP LP835	1020	8	128
10L ADP LP840	1036	8	130
10L ADP LP850	1066	8	133
15L ADP LP830	1393	12	116
15L ADP LP835	1442	12	120
15L ADP LP840	1465	12	122
15L ADP LP850	1506	12	126
20L ADP LP830	1994	18	111
20L ADP LP835	2064	18	115
20L ADP LP840	2097	18	117
20L ADP LP850	2157	18	120
30L ADP LP830	2989	27	111
30L ADP LP835	3095	27	115
30L ADP LP840	3144	27	116
30L ADP LP850	3234	27	120
40L ADP LP830	3881	36	108
40L ADP LP835	4018	36	112
40L ADP LP840	4082	36	113
40L ADP LP850	4199	36	117

MOUNTING DATA	
Ceiling Type	Appropriate Trim Type
Exposed grid tee (1' and 9/16")	G
Concealed grid tee	G
Plaster or plasterboard	G*



*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 12-3/4" x 24-3/4" (Tolerance is +1/8", -0").



Catalog Number
Notes
Type

Contractor Select™

UCEL LED

Linkable LED Undercabinet

LED undercabinet lighting can be used as a source of task or accent lighting in new construction and retrofit applications. Smooth illumination lenses make the UCEL ideal for use under and over cabinets, display cases, task lighting, office lighting, cover and utility/work areas in commercial, retail, hospitality and residential applications.

FEATURES:

- Available in 12", 24" and 36" lengths.
- Produces 388-1162 lumens.
- Features an on/off rocker switch



Catalog Number	UPC	Description	Replaces Up To	Lumens	Input Watts	CCT	CRI	Voltage	Pallet qty.
UCEL 12IN 30K 90CRI SWR WH M6	889804600209	12" Economy LED Undercabinet	1-8W T5 Fluorescent	388	6W	3000K	90	120V	864
UCEL 24IN 30K 90CRI SWR WH M6	889804600223	24" Economy LED Undercabinet	2-8W T5 Fluorescent	742	10W	3000K	90	120V	576
UCEL 36IN 30K 90CRI SWR WH M6	889804600247	36" Economy LED Undercabinet	1-25W T8 Fluorescent	1,162	15W	3000K	90	120V	288

Accessories: Order as separate catalog number.

UC 5FT POWERCORD WH	White 5' cord and plug.
UCD JB	White Junction/Splice box - allows for quick and easy direct wiring (UC ERC24 also required for splice box to first fixture)
UC ERC	White 7/8" row connector for end-to-end connections (1 included with each fixture)
UC ERC24	White 24" connector cord for longer length connections between fixtures or splice box (required for splice box to first fixture)



Specifications

INTENDED USE:

Provides task or accent lighting in commercial, retail, hospitality and residential applications. Ideal for use under and over cabinets, display cases, task lighting, office lighting, coves and utility/work areas.

CONSTRUCTION:

Low profile design, with on/off rocker switch. Can be direct wired or powered by 5' cord-and-plug (not included, see accessories). Connect up to 354 watts of fixtures with 13" connector cord or 7/8" end row connector (Included). Rugged post-painted low-profile steel housing with white finish. Acrylic white diffuser provides soft widespread illumination with zip-lock design for easy installation, cleaning, and superior retention.

ELECTRICAL:

Long-life LEDs, coupled with a high-efficiency driver, provide extended service life. Fixture is rated to deliver L70 performance at 50,000 hours and operates at 120 volts, 60Hz. Minimum starting temp -20F. Can direct-wire through rear access plate/knockout by utilizing the included Romex connector or by utilizing the optional UCD JB Junction/Splice box (sold separately). Works with most standard incandescent dimmers (see list of approved dimmers).

INSTALLATION:

All mounting hardware included.

LISTINGS:

UL listed to US and Canadian safety standards. ENERGY STAR® certified product and Title 24 qualified. Listed for damp locations.

WARRANTY:

5-year limited warranty. Complete warranty terms located at:

www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Dimensions

Length: 12" (30.5cm)

Width: 2.83" (7.2cm)

Height: 1.03" (2.6cm)

Weight: 1lb (.45kg)

Length: 24" (61.0cm)

Width: 2.83" (7.2cm)

Height: 1.03" (2.6cm)

Weight: 1.5lbs (.7kg)

Length: 36" (91.4cm)

Width: 2.83" (7.2cm)

Height: 1.03" (2.6cm)

Weight: 2.3lbs (1kg)

All dimensions are inches (centimeters) unless otherwise indicated.



PRODUCT DATA SHEET

UltraBright™ Architectural Series



5 Year
Warranty



www.FlexfireLEDs.com ◀

Description

Our UltraBright™ Architectural Series is an excellent choice to meet the demand of architectural design and innovative lighting projects. We designed this LED strip with the market's leading components for incredibly brilliant luminance (519 lumen/ft), excellent color rendering and longer run lengths. This product is often paired with a variety of dimming options to allow its use in most applications, from high brightness to comfortable accents.

Product Features

- High CRI of 80+
- Highest Brightness - Up to 519 Lumen/ft (1,703/Meter)
- Fully dimmable
- Highest quality components and premium packaged 3014 LEDs
- Single BIN LED selection to ensure color consistency (3-Step MacAdam)
- Thermally Resistant 3M VHB 4930 adhesive for long lasting bond
- 120° Beam Angle
- Efficiency up to 100 lm/W
- Only 3/8" (10mm) strip width
- Short LED pitch of 1/4" (7mm)
- 24v DC Input (12v available by special order)
- Can be cut every 2" (51mm)
- 42 LEDs / Foot (140 / Meter)
- Thick double layer 2 oz copper PCB for excellent thermal management
- Operating Temperature -30°C to 60°C
- Maximum Length in Series 32ft 10in (10 Meters)

Product Specific Specifications

Product. SKU	Color* (CCT)	Watts / foot (Meter)	Lumen / foot (Meter)	Luminous efficacy (Lumens / Watt)	CRI	Gamut Score Rg (Color Sat.)	Relative Fidelity Score (RF)
UB-AS-24K	2400K	5.1 W/ft 16.8 W/m	374 lm/ft (1,227 lm/m)	72 lm/W	81	Coming Soon	Coming Soon
UB-AS-27K	2700K	5.1 W/ft 16.8 W/m	457 lm/ft (1,500 lm/m)	88 lm/W	81	Coming Soon	Coming Soon
UB-AS-30K	3000K	5.1 W/ft 16.8 W/m	441 lm/ft (1,447 lm/m)	85 lm/W	81	95.3	82.4
UB-AS-42K	4200K	5.1 W/ft 16.8 W/m	471 lm/ft (1,545 lm/m)	91 lm/W	82	93.4	82.3
UB-AS-62K	6200K	5.1 W/ft 16.8 W/m	519 lm/ft (1,703 lm/m)	100 lm/W	83	95.6	80.8

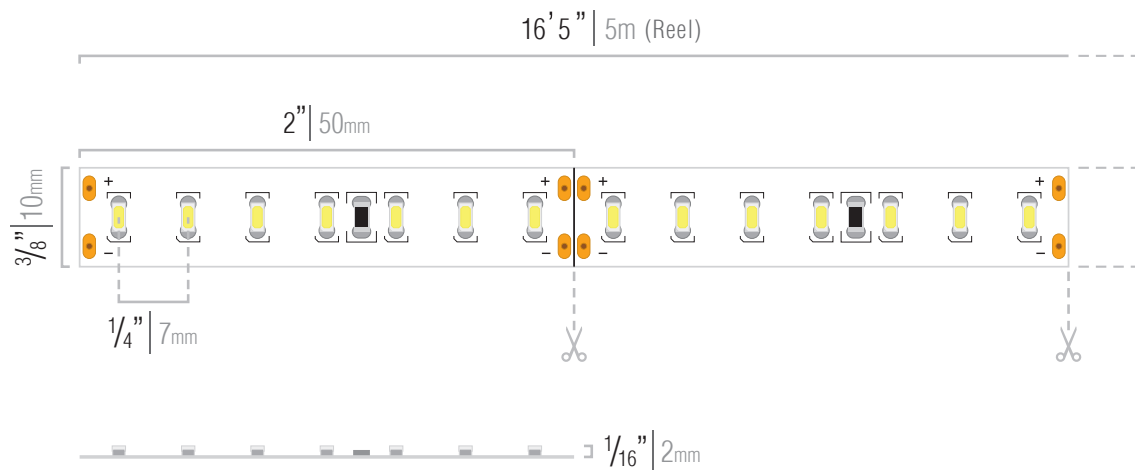
*CCT may be +/-100K but always ordered from same bin and will present no noticeable differences perceived by the human eye.

Ordering Code

INDOOR

Brand	Series	CCT	Voltage	Length
UB - UltraBright	AS - Architectural	24K - 2400K 27K - 2700K 30K - 3000K 42K - 4200K 62K - 6200K	24V 12V - (Special)	01 FT - Under 16 ft 16 FT - 16 ft Reel

Dimensions

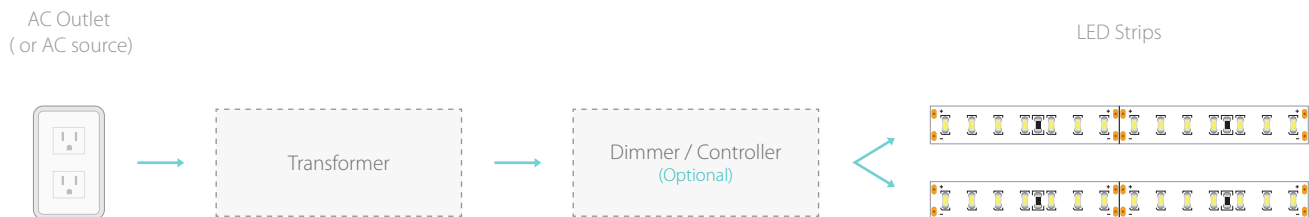


Example Installation and Layout

IN SERIES

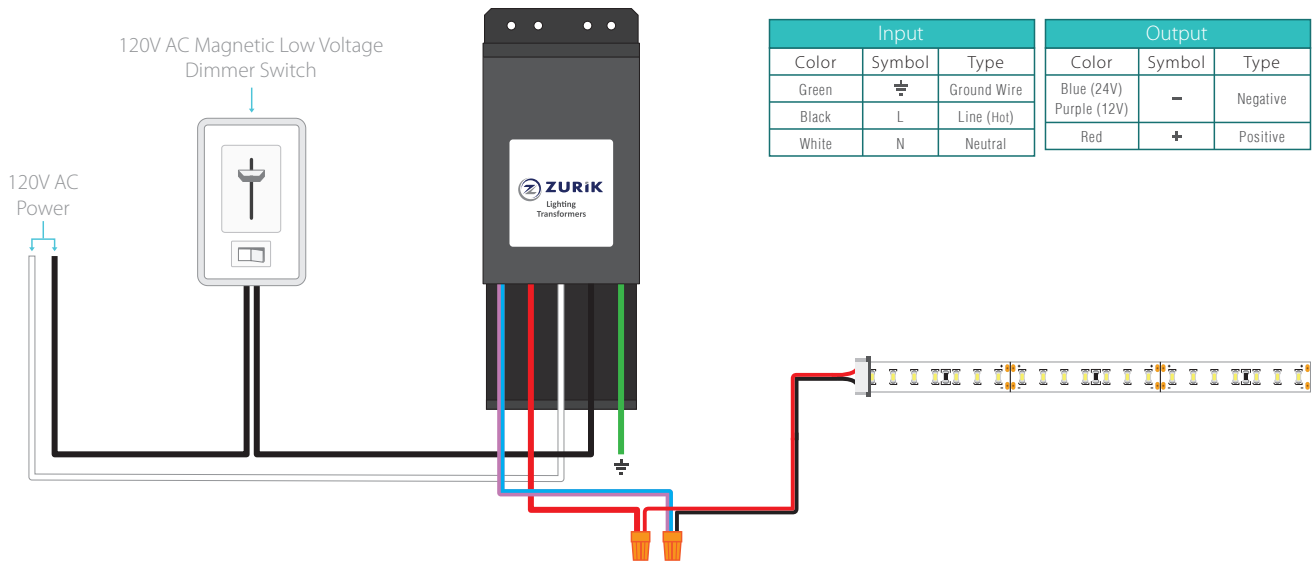


IN PARALLEL

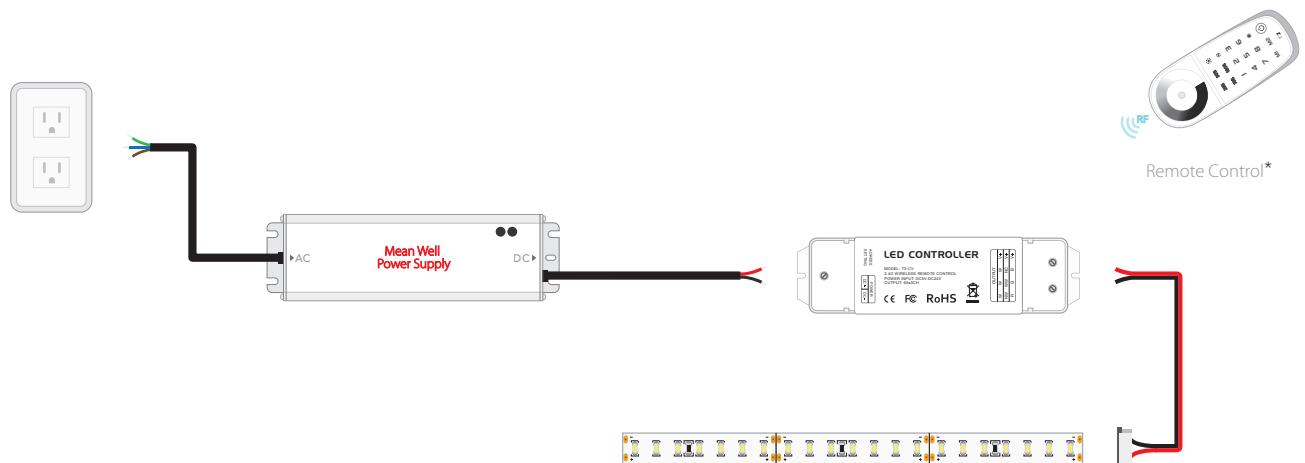


Dimming Options

Lutron Style Wall Dimmer



In-Line Dimming



* Remote Control (SKU: SC-MZ-CTRL) can be paired to 8 total receivers. Multiple remotes cannot be paired to a single receiver (max 1 remote per receiver).

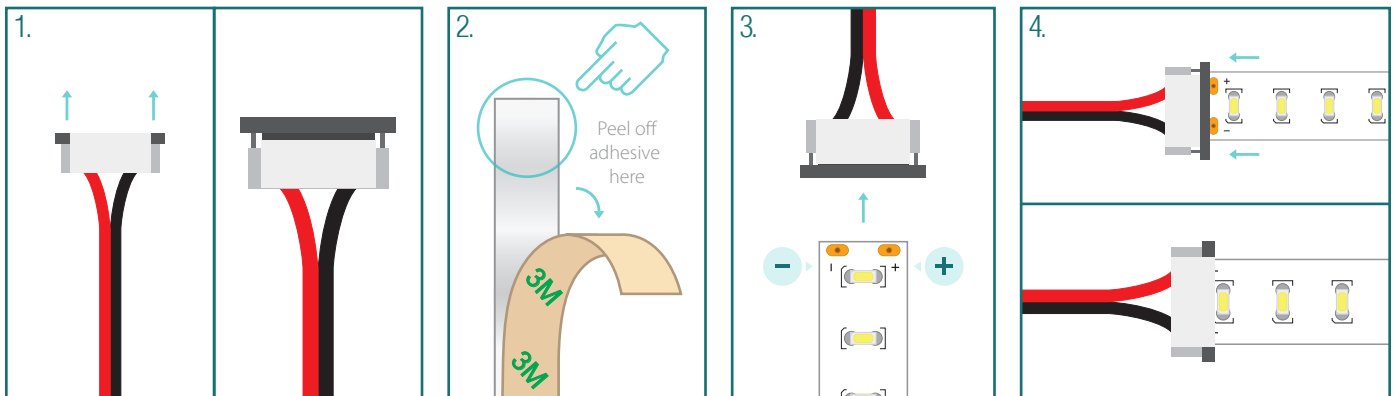
Strip Light Connectors

SKU	Description	Wire Gauge	Amp Limit**	Mockup
UB-C1*	Attaches LED strip directly to a Power Supply/Driver, low voltage control or DC source.	22 AWG	5 Amps	
UB-C2*	Attaches two sections of LED strip together. Wire lead allows for turns around tight corners.	22 AWG		
UB-C3*	Attaches two sections of LED strip together in a continuous run.	-		

* Calculate max length of LED strip to follow the solderless connector based on an amperage draw of 0.21 amps per foot (0.70 A/m) at 24 volts, or via special order at 12 volts use 0.43 A/ft (1.39 A/m).

** The max continuous run of the Architectural Series LED strip is 32 feet (10 meters). Be sure no more than 5 amps is drawn after any solderless connector.

Solderless Connection Guide

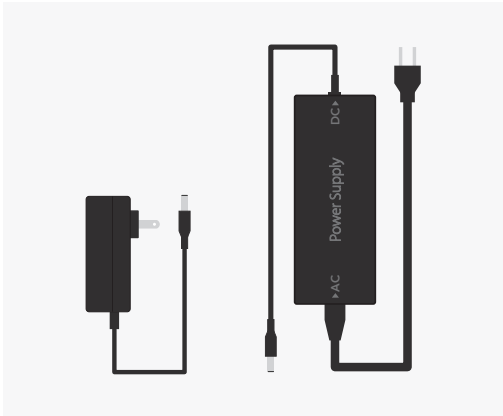


1. The solderless connectors have a plastic housing with a small black tray on the underside. Pull the black plastic tray out until the tray stops. The tray will only pull out approximately 2-3mm, don't try to pull it out farther. *See Diagram 1*
2. Remove 1/4" of 3M adhesive tape on the back from the end of the strip that you want to connect. It must be removed to allow it to fit properly with the solderless connector. *See Diagram 2*
3. Slide the connector into the end of the LED strip by holding the tray out as you slide it in. Make sure the tray does not move into a locked position until the connector is all the way in. *See Diagram 3*
4. Once the LED strip is inserted into the solderless connector, close the black tray underneath by pinching the wings on the side of the connector (inward, toward the connector's housing). *See Diagram 4*

NOTE: Soldering is the preferred method. If you need further assistance, please download our Solderless Connector Installation Guide from our website

Compatible Drivers (24v only)

Wall Mounted Power Supply / Desktop Power Supply



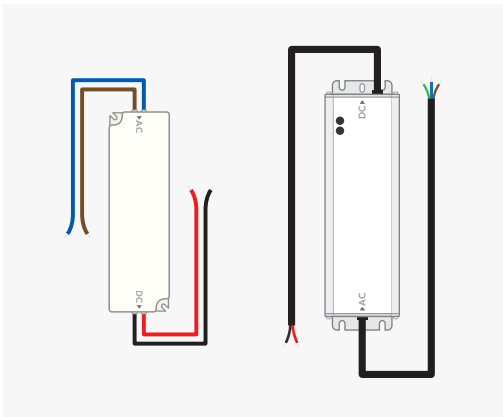
LED Strip Length

1 - 4 ft
5 - 10 ft
10 - 16 ft
12 - 20 ft

SKU

24V-WMPS-1
24V-DPS-2.5
24V-DPS-4
24V-DPS-5

Mean Well



LED Strip Length

1 - 3 ft
4 - 6 ft
6 - 10 ft
8 - 13 ft
10 - 16 ft
12 - 20 ft
18 - 30 ft
24 - 40 ft

SKU

LPV-20-24
HLG-40H-24A
HLG-60H-24A
HLG-80H-24BL
HLG-100H-24A
HLG-120H-24A
HLG-185H-24A
HLG-240H-24A

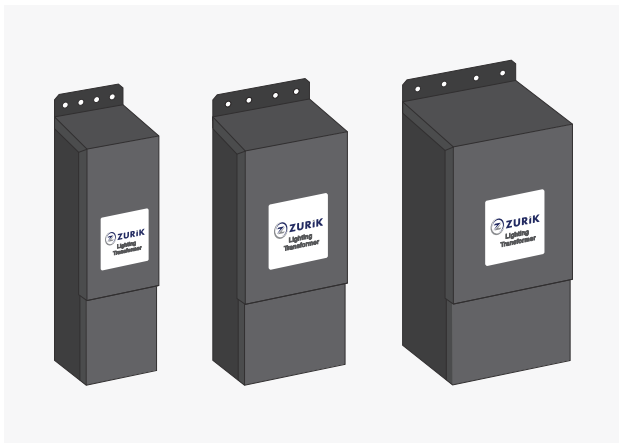
LED Strip Length

32 - 54 ft
54 - 100 ft

SKU

HLG-320H-24A
HLG-600H-24A

Zurik



LED Strip Length

2 - 3 ft
4 - 6 ft
5 - 8 ft
8 - 12 ft
10 - 16 ft
15 - 24 ft
20 - 32 ft
25 - 40 ft
30 - 50 ft

SKU

ZRK-20-24VDC
ZRK-40-24VDC
ZRK-50-24VDC
ZRK-75-24VDC
ZRK-100-24VDC
ZRK-150-24VDC
ZRK-200-24VDC
ZRK-250-24VDC
ZRK-300-24VDC

Compatible Aluminum Extrusions

► KLUS GIP Anodized Extrusion

(SKU: KL-B4574ANODA-1m)



Covers

- G-L Frosted Cover (SKU: KL-00413-1m)

End Caps

- GIP - L End Cap without Wire Hole (SKU: KL-00306)

Mounting Accessories

- GP Surface Spring (SKU: KL-00293)
 - minimum surface thickness 10mm (3/8")
- Mounting Bracket (SKU: KL-24143)

► GIZA Anodized Extrusion

(SKU: KL-B5556ANODA-1m)



Covers

- HS 22 Clear Cover (SKU: KL-17022-1m)
- HS 22 Frosted Cover (SKU: KL-17011-1m)

End Caps

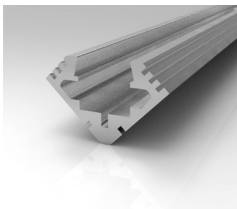
- GIZA End Cap without Wire Hole (SKU: KL-24007)

Mounting Accessories

- GP Surface Spring (SKU: KL-00293)
 - minimum surface thickness 10mm (3/8")
- Mounting Bracket (SKU: KL-24143)

► 45-ALU Anodized Extrusion

(SKU: KL-B4023ANODA-1m)



Covers

- HS Clear Cover (SKU: KL-1370-1m)t
- HS Frosted Cover (SKU: KL-1369-1m)
- LIGER Frosted Cover (SKU: KL-17031-1m)

End Caps

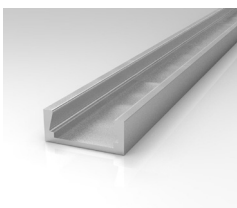
- 45-ALU End Cap without Wire Hole (SKU: KL-1383)
- 45-ALU End Cap with Wire Hole (SKU: KL-1440)

Mounting Accessories

- Zinc Mounting Bracket (SKU: KL-1399)
- NOTE:** All solderless connectors do not fit inside this aluminum extrusion.

► KLUS MICRO-ALU Anodized Extrusion

(KL-B1888ANODA-1m)



Covers

- HS Clear Cover (SKU: KL-1370-1m)t
- HS Frosted Cover (SKU: KL-1369-1m)
- LIGER Frosted Cover (SKU: KL-17031-1m)

End Caps

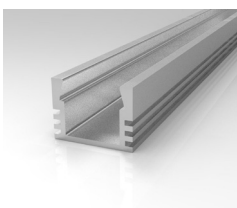
- MICRO-ALU End Cap without Wire Hole (SKU: KL-1059)
- MICRO-ALU End Cap with Wire Hole (SKU: KL-1060)

Mounting Accessories

- Zinc Mounting Bracket (SKU: KL-1072)
- NOTE:** All solderless connectors do not fit inside this aluminum extrusion.

► KLUS PDS4-ALU Anodized Extrusion

(KL-B1718ANODA-1m)



Covers

- HS Clear Cover (SKU: KL-1370-1m)t
- HS Frosted Cover (SKU: KL-1369-1m)
- LIGER Frosted Cover (SKU: KL-17031-1m)

End Caps

- PDS4-ALU End Cap without Wire Hole (SKU: KL-1055)
- PDS4-ALU End Cap with Wire Hole (SKU: KL-1057)

Mounting Accessories

- Zinc Mounting Bracket (SKU: KL-1072)
- NOTE:** All solderless connectors do not fit inside this aluminum extrusion.

Safety And Disclosures

1. Installation must be in accordance with local and national electrical code regulations.
2. To ensure safety and correct installation, our strips are intended to be installed by a qualified, licensed electrician.
3. Only install with a Class 2 DC Constant Voltage LED driver to meet UL requirements.
4. Do not install in environment where excessive heat may exist.
5. LED strip lights must be handled with care. Excessive handling, bending, and pressure may damage the product, voiding the warranty.
6. Do not install indoor LED tape light products in outdoor / wet location environments. Only use copper wiring. Use wires rated for at least 176°F (80°C) and certified for use with external connection of electrical equipment.
7. Each maximum run requires a dedicated power feed from the driver. Do not extend beyond the recommended maximum run length.
8. Make sure the appropriate gauge wire is installed between driver, LEDs, and any dimmers. When choosing wire, calculate voltage drop, maximum amperage rating, and the location ratings on the wire. Improper wire selection and installation could overheat wires, and cause fire.
9. Do not modify product beyond instructions or warranty will be void.
10. We reserve the right to modify and improve the design of our fixtures without prior notice. Although we try our best to order the same colors every time, due to changes in technology and phosphors over time, we cannot guarantee to match existing installed fixtures for subsequent orders or replacements in regards to product appearance, CCT, or lumen output.

Warranty Information

This product has a 5-year limited warranty that starts from the date of shipment. Products must be installed as instructed for warranty to be valid. This warranty does not include the additional accessories referenced in this specification sheet. Complete warranty details for fixtures and additional accessories are available at <https://www.flexfireleds.com/returns-and-exchanges/> within the Policies section. For warranty related questions please contact our support team (support@flexfireleds.com).