



**Purchasing Department**  
140 Stonewall Avenue West, Ste 204  
Fayetteville, GA 30214  
Phone: 770-305-5420  
[www.fayettecountyga.gov](http://www.fayettecountyga.gov)

September 6, 2022

**Subject: Invitation to Bid #2052-B: Animal Shelter Construction**

Gentlemen/Ladies:

Fayette County, Georgia invites you to submit a bid for construction of an animal shelter. You are invited to submit a bid in accordance with the information contained herein.

**A mandatory pre-bid conference will be held at 10:00 a.m., Wednesday, September 21, 2022, at 1155 Highway 74 South, Peachtree City, GA 30269** to provide an opportunity for you to become more familiar with the project, and to ask questions. Companies that attend will be invited to submit bids.

Questions concerning this invitation to bid should be addressed to Natasha M. Duggan in writing via email to [nduggan@fayettecountyga.gov](mailto:nduggan@fayettecountyga.gov) or fax to (770) 719-5534. **Questions will be accepted until 2:00 p.m., Thursday, September 29, 2022.**

Purchasing Department office hours are Monday through Friday 8:00 a.m. to 5:00 p.m. The office telephone number is (770) 305-5420.

Please return your response to the following address:

Fayette County Purchasing Department  
140 Stonewall Avenue West, Suite 204  
Fayetteville, Georgia 30214

Bid Number: **2052-B**

Bid Name: **Animal Shelter Construction**

Your envelope *must* be sealed and should show your company's name and address.

**Bids will be received at the above address until 3:00 p.m., Wednesday, October 5, 2022, in the Purchasing Department, Suite 204.** Bids will be opened at that time.

Bids must be signed to be considered. Late bids cannot be considered. Faxed bids or emailed bids cannot be considered.

If you download this invitation to bid from the county's web site, it will be your responsibility to check the web site for any addenda that might be issued for this solicitation. The county cannot not be responsible for a vendor not receiving information provided in any addendum.

Thank you for participating in the solicitation process.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ted L. Burgess", with a large, sweeping flourish at the end.

Ted L. Burgess  
Director of Purchasing

**PROJECT MANUAL**  
**AND**  
**SPECIFICATIONS**  
**FOR THE**  
**FAYETTE COUNTY**  
**ANIMAL SHELTER**

INVITATION TO BID #2052-B



**Peachtree City, Georgia**

**AUGUST 05, 2020**

Prepared by



**CARTER WATKINS**  
**ASSOCIATES**  
A R C H I T E C T S ,  
I N C .

137 East Washington Street    Post Office Box 1004  
Monroe, Georgia 30655-1004  
770/267-1064 FAX

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**Checklist of Documents to Return**  
**ITB #2052-B: Animal Shelter Construction**

*Please return this checklist and the documents listed below with your submittal.*

Company Information Form \_\_\_\_\_

Bid Form\* \_\_\_\_\_

Exceptions to Specifications, if any \_\_\_\_\_

Bid Bond\* \_\_\_\_\_

References \_\_\_\_\_

Contractor Affidavit under O.C.G.A. § 13-10-91(b) \_\_\_\_\_

Copy of Contractor's License \_\_\_\_\_

\*Failure to submit this document will make the bid **non-responsive** and not eligible for award consideration.

**COMPANY NAME:** \_\_\_\_\_

**COMPANY INFORMATION**  
**ITB #2052-B: ANIMAL SHELTER CONSTRUCTION**

**A. COMPANY**

Company Name: \_\_\_\_\_

Physical Address: \_\_\_\_\_

\_\_\_\_\_

Mailing Address (if different): \_\_\_\_\_

\_\_\_\_\_

Website (if applicable): \_\_\_\_\_

**B. AUTHORIZED REPRESENTATIVE**

Signature: \_\_\_\_\_

Printed or Typed Name: \_\_\_\_\_

Title: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

**C. PROJECT CONTACT PERSON**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Office Number: \_\_\_\_\_ Cell Number: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

**REFERENCES**  
**ITB #2052-B: ANIMAL SHELTER CONSTRUCTION**

Please list three (3) references for current or recent customers who can verify the quality of service your company provides. Projects of similar size and scope are preferable.

1. Government/Company Name \_\_\_\_\_

City & State \_\_\_\_\_

Work or Service Provided \_\_\_\_\_

Approximate Completion Date \_\_\_\_\_

Contact Person and Title \_\_\_\_\_

Phone \_\_\_\_\_ Email \_\_\_\_\_

2. Government/Company Name \_\_\_\_\_

City & State \_\_\_\_\_

Work or Service Provided \_\_\_\_\_

Approximate Completion Date \_\_\_\_\_

Contact Person and Title \_\_\_\_\_

Phone \_\_\_\_\_ Email \_\_\_\_\_

3. Government/Company Name \_\_\_\_\_

City & State \_\_\_\_\_

Work or Service Provided \_\_\_\_\_

Approximate Completion Date \_\_\_\_\_

Contact Person and Title \_\_\_\_\_

Phone \_\_\_\_\_ Email \_\_\_\_\_

**COMPANY NAME** \_\_\_\_\_

# **BID FORM**

## **Fayette County Board of Commissioners New Fayette County Animal Shelter**

### **BID SUBMITTAL FORM**

#### **Project Location: Peachtree City, Georgia**

ALL BIDS ARE TO BE ACCOMPANIED BY A BID BOND, GEORGIA E-VERIFY AFFIDAVIT, BID SUMMARY FORM.

The undersigned BIDDER, having visited the project site and having examined these documents, and having full knowledge of the condition under which the work described herein must be performed, hereby proposes that she/he will fulfill the obligations contained herein in accordance with all instructions, terms, conditions, and specifications set forth; and that she/he will furnish all required products/services and pay all incidental costs in strict conformity with these documents for the stated prices as payment in full.

Base Bid (written out) \_\_\_\_\_

Base Bid (numerically) \$ \_\_\_\_\_

For Alternates below, please clearly indicate with a plus (+) or minus (-) whether the alternate sum is an addition or deduction from the base bid.

Alternate #1 - Provide 6:12 roof slope in lieu of 4:12 \$ \_\_\_\_\_

Alternate #2 - Provide Sprinkler system and riser room \$ \_\_\_\_\_

Alternate #3 - Provide R-49 Spray-foam attic insulation in lieu of batt \$ \_\_\_\_\_

Contractor shall include the discovery of any errors, omissions, or inconsistencies in the Contract Documents with the bid proposal. This information shall be listed on the Exceptions form included in project manual.

Submitting Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Name and Title of Authorized Representative (print/type): \_\_\_\_\_

Authorized Signature: \_\_\_\_\_

(Signature-When signed, this bid is legal and binding to the Fayette County Board of Commissioners and acknowledges that ALL Specifications, Terms and Conditions and/or instructions to Bidders have been read and understood).

Date: \_\_\_\_\_

Email: \_\_\_\_\_

Initial below for Acknowledgment of Addenda (if any). Be certain to check the Purchasing Department web site prior to the bid for all Addenda.

\_\_\_\_\_Addendum #1\_\_\_\_\_Addendum #2\_\_\_\_\_Addendum #3\_\_\_\_\_Addendum #4

\_\_\_\_\_Addendum #5\_\_\_\_\_Addendum #6\_\_\_\_\_Addendum #7\_\_\_\_\_Addendum #8

## BID SUMMARY FORM

## BID SUMMARY FOR ITB 2052-B: FAYETTE COUNTY ANIMAL SHELTER CONSTRUCTION

A	General Conditions	Cost \$	Sub-total	Proposed Subcontractors
101	Permits (BY OWNER)	\$ -		
102	Mobilization and Field Office			
103	Performance Bond / 100% Material Payment Bond			
104	Project Insurance			
105	Payroll Taxes & Benefits			
106	Job Supervision			
107	Field Eng. / Layout /Construction Staking / Testing			
108	Equipment			
109	Expendables / Job Trailer / Toilets / Misc. Expenses			
110	Construction Utilities (Temporary)			
111	Construction Project Signage Allowance	\$ 1,000.00		
112	General Clean-up & Disposal			
<b>A</b>	<b>Subtotal</b>		\$	
<b>B</b>	<b>Site Development</b>			
201	FEMA Elevation Certificate			
202	Concrete Sidewalks, Drives and Aprons			
203	Erosion Control Maintenance			
204	Landscape Plan			
205	Site Utilities Connections			
207	Curb & Gutter / Striping / Signage			
208	Project signage			
209	Temporary Fencing			
<b>B</b>	<b>Subtotal</b>		\$ -	
<b>C</b>	<b>Building Construction</b>			
302	Concrete			
303	Masonry/Masonry Veneer			
304	Steel			
305	Rough Carpentry, Framing, Ply-wood (including nailers and sheathing)			
306	Cabinetry/Millwork			
307	Batt Insulation/Polyisoanurate insulation Board			
308	Pre-engineered wood-frame/wood truss "Morton" Building including all framed walls, trusses.			
309	Flashing and Sheet Metal			
310	Waterproofing			
311	Cement Board Siding and Trim			
312	Caulking and Sealants			
313	Doors & Frames			
314	Door Finish Hardware (see allowances)			
314a	Interior Door Leaf (23 doors/maximum \$800 per door)	\$ 18,400.00		
314b	Exterior Door Leaf (7 doors/maximum \$1,200 per door)	\$ 8,400.00		
315	Metal Roofing, Gutters & Downspouts			
316	Fiber-Reinforced Panels			
317	Aluminum Windows			
318	Lighting Fixtures			
319	Gypsum Wall Board/Cementitious Backer Board Assemblies			
320	Ceiling Assemblies (2x2) & GWB			
321	Carpet			
322	Rubber base			
323	Ceramic tile			
324	Resilient Flooring			
325	Resinous floor covering (Stonclad GS)			
326	Paint			
327	Fire Extinguishers and Accessories (Allow for Type A-B-C 10 lb.)			
328	Toilet Accessories			
329	Plumbing			
330	HVAC			
331	Electrical			
332	Kennels and Veterinary Equipment			
333	Special Equipment			
334	Exterior Metal Stairs			
335	Interior Signage			
336	Misc Finishes			
<b>C</b>	<b>Subtotal</b>		\$	
	Security System Allowance (Fire, Access Control, Security & Cameras)		\$ 60,000.00	
	General Contingency Allowance		\$ 60,000.00	
	<b>ANIMAL SHELTER TOTAL BASE BID</b>		\$	
<b>E</b>	<b>Alternate Bid Items:</b>			
<b>For Alternates below, please clearly indicate with a plus (+) or minus (-) whether the alternate sum is an addition or deduction from the base bid.</b>				
	Alternate 1 - Provide 6:12 roof slope in lieu of 4:12			
	Alternate 2 - Provide Sprinkler system and riser room			
	Alternate 3 - Provide R-49 Spray-foam attic insulation in lieu of batt			



## Invitation to Bid #2052-B: Animal Shelter Construction

[illegible]

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# AIA® Document A101® – 2017

## ***Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum***

**AGREEMENT** made as of the     day of             in the year  
*(In words, indicate day, month and year.)*

**BETWEEN** the Owner:

Fayette County, Georgia  
140 West Stonewall Avenue  
Suite 100  
Fayetteville, GA 30214

and the Contractor:  
*(Name, legal status, address and other information)*

for the following Project:  
Fayette County Animal Shelter  
1155 Highway 74 South  
Peachtree City, GA 30269  
Construction of a new 6,000 square foot shelter.

The Architect:

Carter Watkins Architects Associates Inc., Subchapter S Corporation  
P.O. Box 1004  
137 East Washington Street  
Monroe, Georgia  
Telephone Number: 770-267-7799  
Fax Number: 77-267-1064

The Owner and Contractor agree as follows.

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

## TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS

### ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

### ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

### ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- ☐ The date of this Agreement.
- ☐ A date set forth in a notice to proceed issued by the Owner.
- ☒ Established as follows:

Date shall be the date of the Pre-Construction Conference.

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

#### § 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

*(Check one of the following boxes and complete the necessary information.)*

Init.

[ **X** ] Not later than Three Hundred ( 300 ) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

**Portion of Work**

**Substantial Completion Date**

All work – Owner Occupancy.

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

**ARTICLE 4 CONTRACT SUM**

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

**§ 4.2 Alternates**

§ 4.2.1 Alternates, if any, included in the Contract Sum:

**Item**

**Price**

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.

**Item**

**Price**

**Conditions for Acceptance**

§ 4.3 Allowances, if any, included in the Contract Sum:  
(Identify each allowance.)

**Item**

**Price**

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

**Item**

**Units and Limitations**

**Price per Unit (\$0.00)**

§ 4.5 Liquidated damages, if any:

\$750.00 per calendar day excluding Federal Holidays only.

§ 4.6 Other:

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month,

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the First day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the Thirtieth day of the same month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than Forty-five ( 45 ) days after the Architect receives the Application for Payment.

*(Federal, state or local laws may require payment within a certain period of time.)*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner will withhold the following amount, as retainage, from the payment otherwise due:

Five Percent (5%)

§ 5.1.7.1.1 The following items are not subject to retainage:

Init.

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User Notes:

(846155857)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

Total of five percent (5%) of the contract amount will be held after Substantial Completion and released upon completion of all punch list items.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

## § 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

## § 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

six percent per annum 6%

## ARTICLE 6 DISPUTE RESOLUTION

### § 6.1 Initial Decision Maker

The Client Representative, to be determined once contract is executed, will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017.

## § 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2017

☒ Litigation in a court of competent jurisdiction

☐ Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

None

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

Mr. Jerry Collins, Director of Animal Services – Fayette County, Georgia  
jcollins@fayettecountyga.gov, 1155 Highway 74 South, Peachtree City, Georgia, 30269

§ 8.3 The Contractor's representative:

*(Name, address, email address, and other information)*



§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

#### § 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, General Terms and Conditions, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

§ 8.7 Other provisions:

### ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .3 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:

- .5 Drawings

Number	Title	Date
	Bid Documents Dated August 05, 2020	

- .6 Specifications

Section	Title	Date	Pages
	Project Manual Dated August 05, 2020		

- .7 Addenda, if any are issued:

Number	Date	Pages
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Portions of Addenda relating to bidding or proposal requirements are part of the Contract Documents.

- .8 Other Exhibits:

Init.

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(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

(Paragraphs deleted)

This Agreement entered into as of the day and year first written above.

OWNER (Signature)

FAYETTE COUNTY, GEORGIA

(Printed name and title)

CONTRACTOR (Signature)

(Printed name and title)

Init.

# AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:

Fayette County Animal Shelter  
1155 Highway 74 South, Peachtree City, GA 30269

### THE OWNER:

Fayette County, Georgia  
140 Stonewall Avenue West, Suite 100  
Fayetteville, GA 30214

### THE ARCHITECT:

Carter Watkins Associates Architects, Inc.  
137 East Washington Street Monroe, GA 30655

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### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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## **ARTICLE 1 GENERAL PROVISIONS**

### **§ 1.1 Basic Definitions**

#### **§ 1.1.1 The Contract Documents**

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### **§ 1.1.2 The Contract**

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

#### **§ 1.1.3 The Work**

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### **§ 1.1.4 The Project**

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### **§ 1.1.5 The Drawings**

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### **§ 1.1.6 The Specifications**

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### **§ 1.1.7 Instruments of Service**

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### **§ 1.1.8 Initial Decision Maker**

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### **§ 1.2 Correlation and Intent of the Contract Documents**

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### § 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### § 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### § 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### § 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### § 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

### § 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document



G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### **§ 2.2 Evidence of the Owner's Financial Arrangements**

**§ 2.2.1** Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

**§ 2.2.2** Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

**§ 2.2.3** After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.4** Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### **§ 2.3 Information and Services Required of the Owner**

**§ 2.3.1** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.3.2** The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

#### § 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

#### § 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.



§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### § 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### § 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### § 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### § 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### **§ 3.12 Shop Drawings, Product Data and Samples**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will



specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

**§ 3.12.10.2** If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

### **§ 3.13 Use of Site**

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### **§ 3.14 Cutting and Patching**

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### **§ 3.18 Indemnification**

**§ 3.18.1** To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## **ARTICLE 4 ARCHITECT**

### **§ 4.1 General**

**§ 4.1.1** The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

**§ 4.1.2** Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### **§ 4.2 Administration of the Contract**

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

**§ 4.2.2** The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### **§ 4.2.4 Communications**

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

### § 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

### § 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.



When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

## **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

### **§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts**

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

### **§ 6.2 Mutual Responsibility**

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### § 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

### § 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

### ARTICLE 8 TIME

#### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

## § 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

## § 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### § 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.



§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

#### § 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

## § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

## § 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

## § 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

## § 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

#### § 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

### ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

#### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

#### § 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to



- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

#### § 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

#### § 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

#### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 Contractor's Insurance and Bonds**

**§ 11.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

**§ 11.1.2** The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 11.1.3** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## **§ 11.2 Owner's Insurance**

**§ 11.2.1** The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

**§ 11.2.2 Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

## **§ 11.3 Waivers of Subrogation**

**§ 11.3.1** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

## **§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

#### **§11.5 Adjustment and Settlement of Insured Loss**

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

**§ 11.5.2** Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 Uncovering of Work**

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### **§ 12.2 Correction of Work**

##### **§ 12.2.1 Before Substantial Completion**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

##### **§ 12.2.2 After Substantial Completion**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.



§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### § 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### § 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### § 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

### § 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### § 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### § 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

## **ARTICLE 15 CLAIMS AND DISPUTES**

### **§ 15.1 Claims**

#### **§ 15.1.1 Definition**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

#### **§ 15.1.2 Time Limits on Claims**

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

#### **§ 15.1.3 Notice of Claims**

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

#### **§ 15.1.4 Continuing Contract Performance**

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

#### **§ 15.1.5 Claims for Additional Cost**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

#### **§ 15.1.6 Claims for Additional Time**

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.



### § 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### § 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

#### **§ 15.4.4 Consolidation or Joinder**

**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

**§ 15.4.4.2** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

**§ 15.4.4.3** The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

# AIA<sup>®</sup> Document A310<sup>™</sup> – 2010

## **Bid Bond**

### **CONTRACTOR:**

*(Name, legal status and address)*

### **SURETY:**

*(Name, legal status and principal place of business)*

### **OWNER:**

Fayette County, Georgia  
140 Stonewall Avenue West, Suite 140  
Fayetteville, GA 30214

### **BOND AMOUNT: \$**

### **PROJECT:**

Fayette County Animal Shelter, 1155 Highway 74 South, Peachtree City, GA 30269  
ITB 2052-B

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such

### **ADDITIONS AND DELETIONS:**

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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this    day of                      , 2022

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Contractor as Principal)

\_\_\_\_\_  
(Seal)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Surety)

\_\_\_\_\_  
(Seal)

\_\_\_\_\_  
(Title)

Init.

/



# AIA® Document A312™ – 2010

## Payment Bond

**CONTRACTOR:**

*(Name, legal status and address)*

**SURETY:**

*(Name, legal status and principal place of business)*

**OWNER:**

Fayette County, Georgia  
140 Stonewall Avenue West, Suite 100  
Fayetteville, GA 3026

**CONSTRUCTION CONTRACT**

Date:

Amount: \$

Description:

Fayette County Animal Shelter  
1155 Highway 74 South,  
Peachtree City, GA 30269

**ADDITIONS AND DELETIONS:**

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(3B9ADA1B) 60

**BOND**

Date:

*(Not earlier than Construction Contract Date)*

Amount: \$

Modifications to this Bond: | None | See Section 18

**CONTRACTOR AS PRINCIPAL**Company: *(Corporate Seal)*

Signature:

**SURETY**Company: *(Corporate Seal)*

Signature:

Name and

Title:

*(Any additional signatures appear on the last page of this Payment Bond.)*

Name and

Title:

*(FOR INFORMATION ONLY — Name, address and telephone)***AGENT or BROKER:****OWNER'S REPRESENTATIVE:***(Architect, Engineer or other party:)*

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.



**§ 10** The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

**§ 11** The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

**§ 12** No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

**§ 13** Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

**§ 14** When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

**§ 15** Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

## **§ 16 Definitions**

**§ 16.1 Claim.** A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

**§ 16.2 Claimant.** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

**§ 16.3 Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

**§ 16.4 Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

**§ 16.5 Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

**§ 17** If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

**§ 18** Modifications to this bond are as follows:

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_  
(Corporate Seal)

Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

**SURETY**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_  
(Corporate Seal)

Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_



# AIA<sup>®</sup> Document A312<sup>™</sup> – 2010

## Performance Bond

**CONTRACTOR:**

*(Name, legal status and address)*

**SURETY:**

*(Name, legal status and principal place of business)*

**OWNER:**

Fayette County, Georgia  
140 Stonewall Avenue West, Suite 100  
Fayetteville, GA 30214

**CONSTRUCTION CONTRACT**

Date:

Amount: \$

Description:

Fayette County Animal Shelter  
1155 Highway 74 South  
Peachtree City, GA 30269

**ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

#### § 14 Definitions

§ 14.1 **Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 **Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 **Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

*(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)*

**CONTRACTOR AS PRINCIPAL**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_  
*(Corporate Seal)*

Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

**SURETY**

Company: \_\_\_\_\_  
Signature: \_\_\_\_\_  
*(Corporate Seal)*

Name and Title: \_\_\_\_\_  
Address: \_\_\_\_\_

Init.

/

# **AIA**® Document A701™ – 2018

## **Instructions to Bidders**

for the following Project:

Fayette County Animal Shelter  
1155 Highway 74 South Peachtree City, GA 30269

Construction of a new 6,000 square foot shelter.

### **THE OWNER:**

Fayette County, Georgia  
140 West Stonewall Avenue  
Suite 100  
Fayetteville, GA 30214

### **THE ARCHITECT:**

Carter Watkins Architects Associates Inc., Subchapter S Corporation  
P.O. Box 1004  
137 East Washington Street  
Monroe, Georgia  
Telephone Number: 770-267-7799  
Fax Number: 77-267-1064

### **TABLE OF ARTICLES**

- 1 DEFINITIONS**
- 2 BIDDER'S REPRESENTATIONS**
- 3 BIDDING DOCUMENTS**
- 4 BIDDING PROCEDURES**
- 5 CONSIDERATION OF BIDS**
- 6 POST-BID INFORMATION**
- 7 PERFORMANCE BOND AND PAYMENT BOND**
- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS**

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.



## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

*(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)*

Direct and email correspondence to [nduggan@fayettecountyga.gov](mailto:nduggan@fayettecountyga.gov) requesting copies of the invitation to bid.

**§ 3.1.2** Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

**§ 3.1.3** Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

**§ 3.1.4** Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

**§ 3.1.5** The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

### **§ 3.2 Modification or Interpretation of Bidding Documents**

**§ 3.2.1** The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

**§ 3.2.2** Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Fayette County Purchasing Department at least seven days prior to the date for receipt of Bids.

**§ 3.2.3** Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

### **§ 3.3 Substitutions**

**§ 3.3.1** The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

#### **§ 3.3.2 Substitution Process**

**§ 3.3.2.1** Written requests for substitutions shall be received by the Fayette County Purchasing Department at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

**§ 3.3.2.2** Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

**§ 3.3.2.3** If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

**§ 3.3.3** The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

**§ 3.3.4** If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

#### § 3.4 Addenda

§ 3.4.1 Addenda will be posted on the Fayette County Purchasing Department web site. Bidders are responsible to check the site immediately prior to submitting their bid.

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

#### ARTICLE 4 BIDDING PROCEDURES

##### § 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

##### § 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

A bid bond equal to no less than five percent (5%) of the total amount bid, including the base bid and all alternates.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount

of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

**§ 4.2.3** If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 4.2.4** The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning sixty days after the opening of Bids, withdraw its Bid and request the return of its bid security.

### **§ 4.3 Submission of Bids**

**§ 4.3.1** A Bidder shall submit its Bid as indicated below:

*(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)*

By mail or in person to the Fayette County Purchasing Department.

1. Bid Submission: Submit the bid, along with all required documents, in a sealed, opaque envelope with the following information written on the outside of the envelope:

- a. The bidder's company name.
- b. The bid number, which is #2052-B, and,
- c. The bid name, which is *Animal Shelter Construction*.

**§ 4.3.2** Mail or deliver one (1) original bid, signed in ink by a company official authorized to make a legal and binding offer, and one (1) copy on an electronic flash drive, to:

Fayette County Government  
Purchasing Department  
140 Stonewall Avenue West, Suite 204  
Fayetteville, GA 30214

Attention: Natasha Duggan, Contract Administrator

You may submit bids in person, by U.S. Mail, or by a commercial carrier. Do not submit bids by facsimile, email, or other electronic means. Once submitted, all bids become the property of Fayette County.

2. Ethics - Disclosure of Relationships: Before a proposed contract in excess of \$10,000.00 is recommended for award to the Board of Commissioners or the County Administrator, or before the County renews, extends, or otherwise modifies a contract after it has been awarded, the contractor must disclose certain relationships with any County Commissioner or County Official, or their spouse, mother, father, grandparent, brother, sister, son or daughter related by blood, adoption or marriage (including in-laws). A relationship that must be reported exist if any of these individuals is a director, officer, partner, or employee, or has a substantial financial interest in the business, as described in Fayette County Ordinance Chapter 2, Article, IV, Division 3 (Code of Ethics).

If such relationship exists between your company and any individual mentioned above, relevant information must be presented in the form of a written letter to the Director of Purchasing. You must include the letter with any bid, proposal, or price quote you submit to the Purchasing Department.

In the event that a contractor fails to comply with this requirement, the County will take action as appropriate to the situation, which may include actions up to and including rejection of the bid or offer, cancellation of the contract in question, or debarment or suspension from award of a County contract for a period of up to the three years.

3. Unavailability of Funds: This contract will terminate immediately and absolutely at such time as the appropriated and otherwise unobligated funds are no longer available to satisfy the obligations of the County under the contract.

**§ 4.3.3** Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

**§ 4.3.4** The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

**§ 4.3.5** A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

#### **§ 4.4 Modification or Withdrawal of Bid**

**§ 4.4.1** Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

**§ 4.4.2** Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

**§ 4.4.3** After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Director of Purchasing of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Director of Purchasing, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:  
*(Paragraph Deleted)*

*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

Refunded in full and Bid Bond returned.

#### **ARTICLE 5 CONSIDERATION OF BIDS**

##### **§ 5.1 Opening of Bids**

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

##### **§ 5.2 Rejection of Bids**

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

### **§ 5.3 Acceptance of Bid (Award)**

**§ 5.3.1** It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, 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 judgment, is in the Owner's best interests.

**§ 5.3.2** Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 Contractor's Qualification Statement**

*Paragraph Deleted*

### **§ 6.2 Owner's Financial Capability**

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 Submittals**

**§ 6.3.1** After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

**§ 6.3.2** The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

**§ 6.3.3** Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

**§ 6.3.4** Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## **ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

### **§ 7.1 Bond Requirements**

**§ 7.1.1** If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.



§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

*(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)*

100% of the Construction Contract.

## § 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner prior to execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

## ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below,.
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.

*(Paragraphs Deleted)*

- .5 Drawings

Number

Title

Date

Dated August 05, 2020

**.6 Specifications**

**Section**

**Title**

**Date**

**Pages**

Dated August 05, 2020

**.7 Addenda:**

**Number**

**Date**

**Pages**

**.8 Other Exhibits:**

*(Paragraph Deleted)*

*(Paragraph Deleted)*

*(Table Deleted)*

*(Table Deleted)*

*(Paragraphs Deleted)*



# FEMA

*NATIONAL FLOOD INSURANCE PROGRAM*

# ELEVATION CERTIFICATE

AND

# INSTRUCTIONS

**2019 EDITION**

**Successful contractor shall provide a completed FEMA Elevation Certificate.**

U.S. DEPARTMENT OF HOMELAND SECURITY  
Federal Emergency Management Agency  
National Flood Insurance Program

## ELEVATION CERTIFICATE AND INSTRUCTIONS

### Paperwork Reduction Act Notice

Public reporting burden for this data collection is estimated to average 3.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and submitting this form. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street SW, Washington, DC 20742, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.**

### Privacy Act Statement

**Authority:** Title 44 CFR § 61.7 and 61.8.

**Principal Purpose(s):** This information is being collected for the primary purpose of estimating the risk premium rates necessary to provide flood insurance for new or substantially improved structures in designated Special Flood Hazard Areas.

**Routine Use(s):** The information on this form may be disclosed as generally permitted under 5 U.S.C. § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA-003 – National Flood Insurance Program Files System or Records Notice 73 Fed. Reg. 77747 (December 19, 2008); DHS/FEMA/NFIP/LOMA-1 – National Flood Insurance Program (NFIP) Letter of Map Amendment (LOMA) System of Records Notice 71 Fed. Reg. 7990 (February 15, 2006); and upon written request, written consent, by agreement, or as required by law.

**Disclosure:** The disclosure of information on this form is voluntary; however, failure to provide the information requested may result in the inability to obtain flood insurance through the National Flood Insurance Program or the applicant may be subject to higher premium rates for flood insurance. Information will only be released as permitted by law.

### Purpose of the Elevation Certificate

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate Post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, and AR/AO. The Elevation Certificate is not required for Pre-FIRM buildings unless the building is being rated under the optional Post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt floodplain management regulations that specify minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in FEMA Publication 467-1, Floodplain Management Bulletin: Elevation Certificate, available on FEMA's website at <https://www.fema.gov/media-library/assets/documents/3539?id=1727>.



# ELEVATION CERTIFICATE

**Important:** Follow the instructions on pages 1–9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION						FOR INSURANCE COMPANY USE
A1. Building Owner's Name						Policy Number:
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.						Company NAIC Number:
City		State			ZIP Code	
A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)						
A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) _____						
A5. Latitude/Longitude: Lat. _____ Long. _____ Horizontal Datum: <input type="checkbox"/> NAD 1927 <input type="checkbox"/> NAD 1983						
A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.						
A7. Building Diagram Number _____						
A8. For a building with a crawlspace or enclosure(s):						
a) Square footage of crawlspace or enclosure(s) _____ sq ft						
b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade _____						
c) Total net area of flood openings in A8.b _____ sq in						
d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No						
A9. For a building with an attached garage:						
a) Square footage of attached garage _____ sq ft						
b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade _____						
c) Total net area of flood openings in A9.b _____ sq in						
d) Engineered flood openings? <input type="checkbox"/> Yes <input type="checkbox"/> No						
SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION						
B1. NFIP Community Name & Community Number				B2. County Name		B3. State
B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth)	
B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9: <input type="checkbox"/> FIS Profile <input type="checkbox"/> FIRM <input type="checkbox"/> Community Determined <input type="checkbox"/> Other/Source: _____						
B11. Indicate elevation datum used for BFE in Item B9: <input type="checkbox"/> NGVD 1929 <input type="checkbox"/> NAVD 1988 <input type="checkbox"/> Other/Source: _____						
B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? <input type="checkbox"/> Yes <input type="checkbox"/> No Designation Date: _____ <input type="checkbox"/> CBRS <input type="checkbox"/> OPA						

**ELEVATION CERTIFICATE**OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

**SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)**C1. Building elevations are based on: ☐ Construction Drawings\* ☐ Building Under Construction\* ☐ Finished Construction

\*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: \_\_\_\_\_ Vertical Datum: \_\_\_\_\_

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☐ NAVD 1988 ☐ Other/Source: \_\_\_\_\_

Datum used for building elevations must be the same as that used for the BFE.

Check the measurement used.

- |   |       |   |
|---|-------|---|
| a) Top of bottom floor (including basement, crawlspace, or enclosure floor)   | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| b) Top of the next higher floor   | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| c) Bottom of the lowest horizontal structural member (V Zones only)   | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| d) Attached garage (top of slab)  | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| e) Lowest elevation of machinery or equipment servicing the building<br>(Describe type of equipment and location in Comments) | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| f) Lowest adjacent (finished) grade next to building (LAG)  | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| g) Highest adjacent (finished) grade next to building (HAG)   | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |
| h) Lowest adjacent grade at lowest elevation of deck or stairs, including<br>structural support                               | _____ | <input type="checkbox"/> feet <input type="checkbox"/> meters |

**SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION**

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.

Were latitude and longitude in Section A provided by a licensed land surveyor? ☐ Yes ☐ No ☐ Check here if attachments.

Certifier's Name	License Number	<b>Place Seal Here</b>	
Title			
Company Name			
Address			
City	State ZIP Code		
Signature	Date	Telephone	Ext.
Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.			
Comments (including type of equipment and location, per C2(e), if applicable)			



**ELEVATION CERTIFICATE**OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

**SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED)  
FOR ZONE AO AND ZONE A (WITHOUT BFE)**

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- b) Top of bottom floor (including basement, crawlspace, or enclosure) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the LAG.
- E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E3. Attached garage (top of slab) is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is \_\_\_\_\_ ☐ feet ☐ meters ☐ above or ☐ below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

**SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name

Address City State ZIP Code

Signature Date Telephone

Comments

☐ Check here if attachments.

**ELEVATION CERTIFICATE**OMB No. 1660-0008  
Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

**SECTION G – COMMUNITY INFORMATION (OPTIONAL)**

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

- G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3. ☐ The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate of Compliance/Occupancy Issued
-------------------	------------------------	---

- G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement
- G8. Elevation of as-built lowest floor (including basement) of the building: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_
- G9. BFE or (in Zone AO) depth of flooding at the building site: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_
- G10. Community's design flood elevation: \_\_\_\_\_ ☐ feet ☐ meters Datum \_\_\_\_\_

Local Official's Name	Title
-----------------------	-------

Community Name	Telephone
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Signature	Date
-----------	------

Comments (including type of equipment and location, per C2(e), if applicable)

☐ Check here if attachments.

**BUILDING PHOTOGRAPHS****ELEVATION CERTIFICATE**

See Instructions for Item A6.

OMB No. 1660-0008

Expiration Date: November 30, 2022

<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>			<b>FOR INSURANCE COMPANY USE</b>
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			Policy Number:
City	State	ZIP Code	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

Photo One

Photo One

Photo One Caption

Clear Photo One

Photo Two

Photo Two

Photo Two Caption

Clear Photo Two

**ELEVATION CERTIFICATE****BUILDING PHOTOGRAPHS**

Continuation Page

OMB No. 1660-0008

Expiration Date: November 30, 2022

**IMPORTANT: In these spaces, copy the corresponding information from Section A.****FOR INSURANCE COMPANY USE**

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.

Policy Number:

City

State

ZIP Code

Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.

**Photo Three**

Photo Three

Photo Three Caption

Clear Photo Three

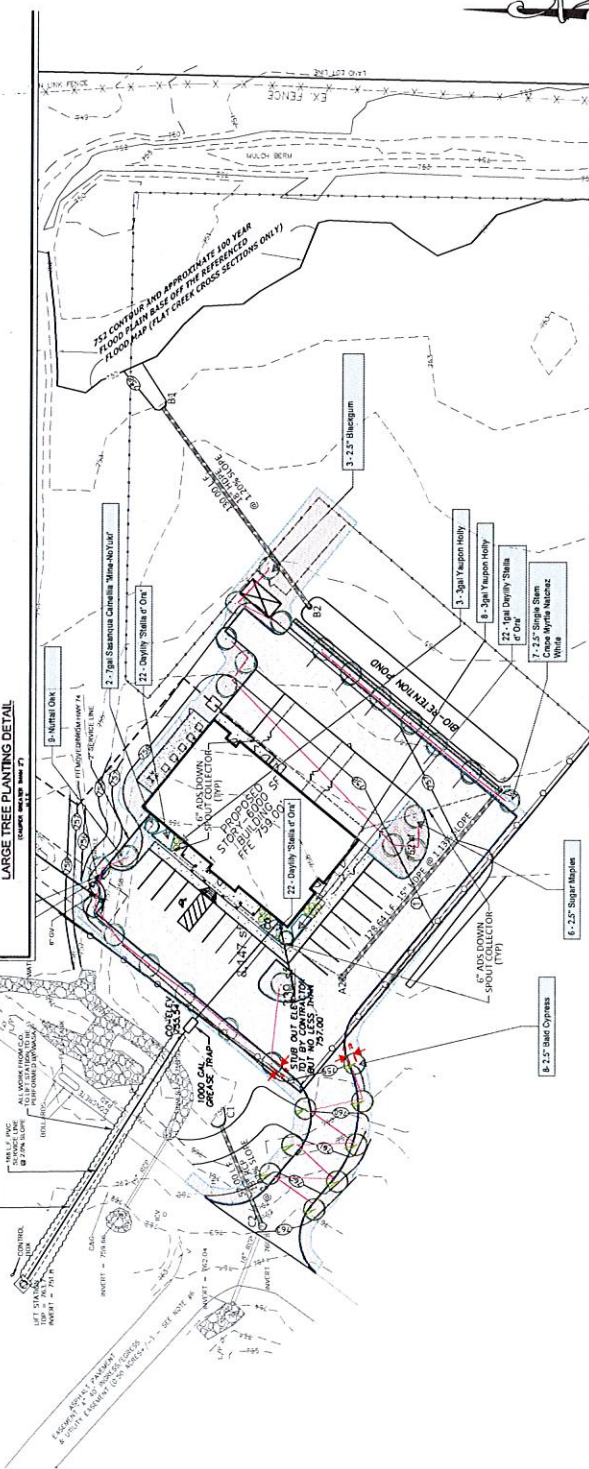
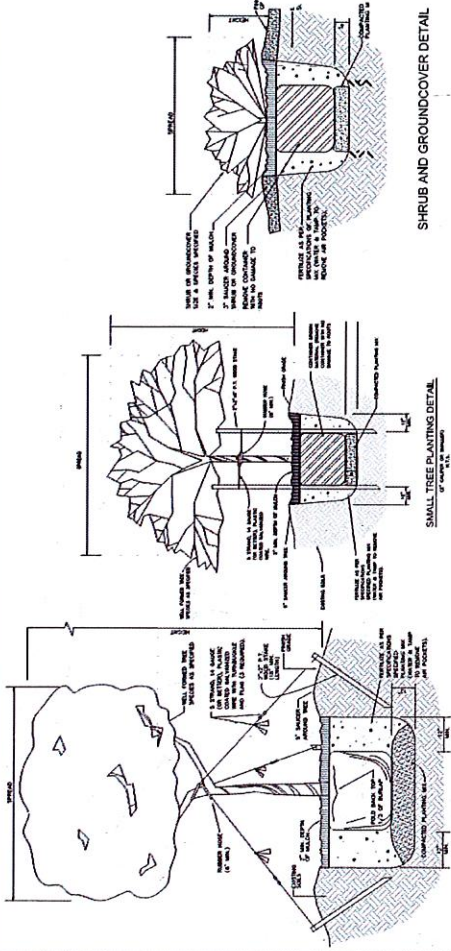
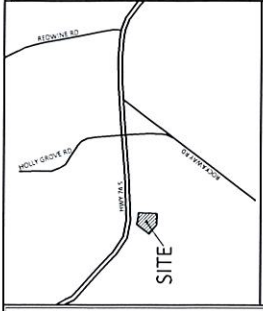
**Photo Four**

Photo Four

Photo Four Caption

Clear Photo Four





Genotype	Spacing
1 - 'Valcour Holly' Bordeaux <sup>a</sup> × laxa vomitoria	3" spacing
2 - Sarcocolla Camellia 'Mrs-No-Yo-Yo' White flower (Alemare - Gal Tea Olive)	5" spacing
6 - Daily's 'Stella d'Or'	10" spacing

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT <sup>1</sup>	DATE COMPLETED
<b>1705.8</b>					
Verify fabrication/quality control procedures	In-plant review (3)	N	Periodic		
<b>1705.1.1 Special Cases</b> (work unusual in nature, including but not limited to alternative materials and systems, unusual design applications, materials and systems with special manufacturer's requirements)	Submittal review, shop (3) and/or field inspection	Y			
<b>1705.2 Steel Construction</b>					
1. Fabricator and erector documents (Verify reports and certificates as listed in AISC 360, chapter N, paragraph 3.2 for compliance with construction documents)	Submittal Review	N	Each submittal		
2. Material verification of structural steel	Shop (3) and field inspection	N	Periodic		
3. Embedments (Verify diameter, grade, type, length, embedment. See 1705.3 for anchors)	Field inspection	N	Periodic		
4. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents	Field inspection	N	Periodic		
5. Structural steel welding:					
a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-1)	Shop (3) and field inspection	N	Observe or Perform as noted (4)		
b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-2)	Shop (3) and field inspection	N	Observe (4)		
c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-3)	Shop (3) and field inspection	N	Observe or Perform as noted (4)		
d. Nondestructive testing (NDT) of welded joints: <i>see Commentary</i>		N			
1) Complete penetration groove welds 5/16" or greater in <i>risk category III or IV</i>	Shop (3) or field ultrasonic testing - 100%	N	Periodic		
2) Complete penetration groove welds 5/16" or greater in <i>risk category II</i>	Shop (3) or field ultrasonic testing - 10% of welds minimum	N	Periodic		
3) Thermally cut surfaces of access holes when material $t > 2'$	Shop (3) or field magnetic Partical or Penetrant testing	N	Periodic		
4) Welded joints subject to fatigue when required by AISC 360, Appendix 3, Table A-3.1	Shop (3) or field radiographic or Ultrasonic testing	N	Periodic		
5) Fabricator's NDT reports when fabricator performs NDT	Verify reports	N	Each submittal (5)		
6. Structural steel bolting:	Shop (3) and field inspection				
a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection, in accordance with QA tasks listed in AISC 360, Table N5.6-1)		N	Observe or Perform as noted (4)		



SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT <sup>1</sup>	DATE COMPLETED
b. Inspection tasks During Bolting (Observe the QA tasks listed in AISC 360, Table N5.6-2)		N	Observe (4)		
1) Pre-tensioned and slip-critical joints		N			
a) Turn-of-nut with matching markings		N	Periodic		
b) Direct tension indicator		N	Periodic		
c) Twist-off type tension control bolt		N	Periodic		
d) Turn-of-nut without matching markings		N	Continuous		
e) Calibrated wrench		N	Continuous		
2) Snug-tight joints			Periodic		
c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-3)		N	Perform (4)		
7. Inspection of steel elements of composite construction prior to concrete placement in accordance with QA tasks listed in AISC 360, Table N6.1	Shop (3) and field inspection and testing	N	Observe or Perform as noted (4)		
<b>1705.2.2 Steel Construction Other Than Structural Steel</b>					
1. Material verification of cold-formed steel deck:		N			
a. Identification markings	Field inspection		Periodic		
b. Manufacturer's certified test reports	Submittal Review		Each submittal		
2. Connection of cold-formed steel deck to supporting structure:	Shop (3) and field inspection	N			
a. Welding			Periodic		
b. Other fasteners (in accordance with AISC 360, Section N6)		N			
1) Verify fasteners are in conformance with approved submittal		N	Periodic		
2) Verify fastener <b>installation</b> is in conformance with approved submittal and manufacturer's recommendations		N	Periodic		
3. Reinforcing steel	Shop (3) and field inspection	N			
a. Verification of weldability of steel other than ASTM A706			Periodic		
b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, boundary elements of special concrete structural walls and shear reinforcement		Y	Continuous		
c. Shear reinforcement		Y	Continuous		
d. Other reinforcing steel		Y	Periodic		
4. Cold-formed steel trusses spanning 60 feet or greater		N			
a. Verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package	Field inspection	N	Periodic		
<b>1705.3 Concrete Construction</b>		Y			
1. Inspection of reinforcing steel installation (see 1705.2.2 for welding)	Shop (3) and field inspection	Y	Periodic.		
2. Inspection of prestressing steel installation	Shop (3) and field inspection	N	Periodic		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT	DATE COMPLETED
3. Inspection of anchors cast in concrete where allowable loads have been increased per section 1908.5 or where strength design is used	Shop (3) and field inspection	Y	Periodic		
4. Inspection of anchors and reinforcing steel post-installed in hardened concrete: Per research reports including verification of anchor type, anchor dimensions, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, concrete minimum thickness, anchor embedment and tightening torque	Field inspection	Y	Periodic or as required by the research report issued by an approved source		
5. Verify use of approved design mix	Shop (3) and field inspection	Y	Periodic		
6. Fresh concrete sampling, perform slump and air content tests and determine temperature of concrete	Shop (3) and field inspection	Y	Continuous		
7. Inspection of concrete and shotcrete placement for proper application techniques	Shop (3) and field inspection	Y	Continuous		
8. Inspection for maintenance of specified curing temperature and techniques	Shop (3) and field inspection	Y	Periodic		
9. Inspection of prestressed concrete:	Shop (3) and field inspection	N			
a. Application of prestressing force		N	Continuous		
b. Grouting of bonded prestressing tendons in the seismic-force-resisting system		N	Continuous		
10. Erection of precast concrete members		N			
a. Inspect in accordance with construction documents	Field inspection	N	In accordance with construction documents		
b. Perform inspections of welding and bolting in accordance with Section 1705.2	Field inspection	N	In accordance with Section 1705.2		
11. Verification of in-situ concrete strength, prior to stressing of tendons in post tensioned concrete and prior to removal of shores and forms from beams and structural slabs	Review field testing and laboratory reports	N	Periodic		
12. Inspection of formwork for shape, lines, location and dimensions	Field inspection	N	Periodic		
13. Concrete strength testing and verification of compliance with construction documents	Field testing and review of laboratory reports	N	Periodic		
<b>1705.4 Masonry Construction</b>					
<b>(A) Level A, B and C Quality Assurance:</b>		N			
1. Verify compliance with approved submittals	Field Inspection	N	Periodic		
<b>(B) Level B Quality Assurance:</b>		N			
1. Verification of f'm and f'AAC prior to construction	Testing by unit strength method or prism test method	N	Periodic		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
<b>(C) Level C Quality Assurance:</b>		Y			
1. Verification of $f'_m$ and $f'_{AAC}$ prior to construction and for every 5,000 SF during construction	Testing by unit strength method or prism test method	Y	Periodic		
2. Verification of proportions of materials in premixed or preblended mortar, prestressing grout, and grout other than self-consolidating grout, as delivered to the project site	Field inspection	Y	Continuous		
3. Verify placement of masonry units	Field Inspection	Y	Periodic		
<b>(D) Levels B and C Quality Assurance:</b>		Y			
1. Verification of Slump Flow and Visual Stability Index (VSI) of self-consolidating grout as delivered to the project	Field testing	Y	Continuous		
2. Verify compliance with approved submittals	Field inspection	Y	Periodic		
3. Verify proportions of site-mixed mortar, grout and prestressing grout for bonded tendons	Field Inspection	Y	Periodic		
4. Verify grade, type, and size of reinforcement and anchor bolts, and prestressing tendons and anchorages	Field Inspection	Y	Periodic		
5. Verify construction of mortar joints	Field Inspection	Y	Periodic		
6. Verify placement of reinforcement, connectors, and prestressing tendons and anchorages	Field Inspection	Y	Level B - Periodic		
			Level C - Continuous		
7. Verify grout space prior to grouting	Field Inspection	Y	Level B - Periodic		
			Level C - Continuous		
8. Verify placement of grout and prestressing grout for bonded tendons	Field Inspection	N	Continuous		
9. Verify size and location of structural masonry elements	Field Inspection	Y	Periodic		
10. Verify type, size, and location of anchors, including details of anchorage of masonry to structural members, frames, or other construction.	Field inspection	Y	Level B - Periodic		
			Level C - Continuous		
11. Verify welding of reinforcement (see 1705.2.2)	Field inspection	Y	Continuous		
12. Verify preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F)	Field inspection	N	Periodic		
13. Verify application and measurement of prestressing force	Field Inspection	N	Continuous		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
14. Verify placement of AAC masonry units and construction of thin-bed mortar joints (first 5000 SF of AAC masonry)	Field inspection	N	Continuous		
15. Verify placement of AAC masonry units and construction of thin-bed mortar joints (after the first 5000 SF of AAC masonry)	Field inspection	N	Level B - Periodic		
		N	Level C - Continuous		
16. Verify properties of thin-bed mortar for AAC masonry (first 5000 SF of AAC masonry)	Field inspection	Y	Continuous		
17. Verify properties of thin-bed mortar for AAC masonry (after the first 5000 SF of AAC masonry)	Field inspection	Y	Level B - Periodic		
		N	Level C - Continuous		
18. Prepare grout and mortar specimens	Field testing		Level B - Periodic		
		N	Level C - Continuous		
19. Observe preparation of prisms	Field inspection		Level B - Periodic		
		N	Level C - Continuous		
<b>170 5. 5 Wood Construction</b>		Y			
1. Inspection of the fabrication process of wood structural elements and assemblies in accordance with Section 1704.2.5	In-plant review (3)	Y	Periodic		
2. For high-load diaphragms, verify grade and thickness of structural panel sheathing agree with approved building plans	Field inspection	Y	Periodic		
3. For high-load diaphragms, verify nominal size of framing members at adjoining panel edges, nail or staple diameter and length, number of fastener lines, and that spacing between fasteners in each line and at edge margins agree with approved building plans	Field inspection	Y	Periodic		
4. Metal-plate-connected wood trusses spanning 60 feet or greater: verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package	Field inspection	Y	Periodic		
<b>170 5.6 Soils</b>					
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	Field inspection	Y	Periodic		
2. Verify excavations are extended to proper depth and have reached proper material.	Field inspection	Y	Periodic		
3. Perform classification and testing of controlled fill materials.	Field inspection	Y	Periodic		
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill	Field inspection	Y	Continuous		
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly	Field inspection	Y	Periodic		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
<b>170 5.7 Driven Deep Foundations</b>		N			
1. Verify element materials, sizes and lengths comply with requirements	Field inspection	N	Continuous		
2. Determine capacities of test elements and conduct additional load tests, as required	Field inspection	N	Continuous		
3. Observe driving operations and maintain complete and accurate records for each element	Field inspection	N	Continuous		
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element	Field inspection	N	Continuous		
5. For steel elements, perform additional inspections per Section 1705.2	See Section 1705.2	N	See Section 1705.2		
6. For concrete elements and concrete-filled elements, perform additional inspections per Section 1705.3	See Section 1705.3	N	See Section 1705.3		
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge	Field inspection	N	In accordance with construction documents		
8. Perform additional inspections and tests in accordance with the construction documents	Field Inspection and testing	N	In accordance with construction documents		
<b>170 5.8 Cast-in-Place Deep Foundations</b>		N			
1. Observe drilling operations and maintain complete and accurate records for each element	Field inspection	N	Continuous		
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes	Field inspection	N	Continuous		
3. For concrete elements, perform additional inspections in accordance with Section 1705.3	See Section 1705.3	N	See Section 1705.3		
4. Perform additional inspections and tests in accordance with the construction documents	Field Inspection and testing	N	In accordance with construction documents		
<b>170 5.9 Helical Pile Foundations</b>		N			
1. Verify installation equipment, pile dimensions, tip elevations, final depth, final installation torque and other data as required.	Field inspection	N	Continuous		
2. Perform additional inspections and tests in accordance with the construction documents	Field Inspection and testing	N	In accordance with construction documents		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
<b>170 5.10.1 Structural Wood Special Inspections For Wind Resistance</b>		Y			
1. Inspection of field gluing operations of elements of the main windforce-resisting system	Field inspection	N	Continuous		
2. Inspection of nailing, bolting, anchoring and other fastening of components within the main windforce-resisting system	Shop (3) and field inspection	Y	Periodic		
<b>170 5.10.2 Cold-formed Steel Special Inspections For Wind Resistance</b>					
1. Inspection during welding operations of elements of the main windforce-resisting system	Shop (3) and field inspection	N	Periodic		
2. Inspections for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system	Shop (3) and field inspection	N	Periodic		
<b>170 5.10.3 Wind-resisting Components</b>					
1. Roof cladding	Shop (3) and field inspection	Y	Periodic		
2. Wall cladding	Shop (3) and field inspection	Y	Periodic		
<b>170 5.11.1 Structural Steel Special Inspections for Seismic Resistance</b>		Y			
Inspection of structural steel in accordance with AISC 341	Shop (3) and field inspection		In accordance with AISC 341		
<b>170 5.11.2 Structural Wood Special Inspections for Seismic Resistance</b>		N			
1. Inspection of field gluing operations of elements of the seismic-force resisting system	Field inspection	N	Continuous		
2. Inspection of nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system	Shop (3) and field inspection	N	Periodic		
<b>170 5.11.3 Cold-formed Steel Light-Frame Construction Special Inspections for Seismic Resistance</b>		N			
1. Inspection during welding operations of elements of the seismic-force-resisting system	Shop (3) and field inspection	N	Periodic		
2. Inspections for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system	Shop (3) and field inspection	N	Periodic		
<b>170 5.11.4 Designated Seismic Systems Verification</b>		N			
Inspect and verify that the component label, anchorage or mounting conforms to the certificate of compliance in accordance with Section 1705.12.3	Field inspection	N	Periodic		



SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
<b>170 5.11. 5 Architectural Components Special Inspections for Seismic Resistance</b>		N			
1. Inspection during the erection and fastening of exterior cladding and interior and exterior veneer	Field inspection	N	Periodic		
2. Inspection during the erection and fastening of interior and exterior nonbearing walls	Field inspection	N	Periodic		
3. Inspection during anchorage of access floors	Field inspection		Periodic		
<b>170 5.11.6 Mechanical and Electrical Components Special Inspections for Seismic Resistance</b>		N			
1. Inspection during the anchorage of electrical equipment for emergency or standby power systems	Field inspection	N	Periodic		
2. Inspection during the anchorage of other electrical equipment	Field inspection	N	Periodic		
3. Inspection during installation and anchorage of piping systems designed to carry hazardous materials, and their associated mechanical units	Field inspection	N	Periodic		
4. Inspection during the installation and anchorage of HVAC ductwork that will contain hazardous materials	Field inspection	N	Periodic		
5. Inspection during the installation and anchorage of vibration isolation systems	Field inspection	N	Periodic		
<b>170 5.11.7 Storage Racks Special Inspections for Seismic Resistance</b>		N			
Inspection during the anchorage of storage racks 8 feet or greater in height	Field inspection	N	Periodic		
<b>170 5.11.8 Seismic Isolation Systems</b>		N			
Inspection during the fabrication and installation of isolator units and energy dissipation devices used as part of the seismic isolation system	Shop and field inspection	N	Periodic		
<b>170 5.12.1 Concrete Reinforcement Testing and Qualification for Seismic Resistance</b>		N			
1. Review certified mill test reports for each shipment of reinforcement used to resist earthquake-induced flexural and axial forces in reinforced concrete special moment frames, special structural walls, and coupling beams connecting special structural walls	Review certified mill test reports	N	Each shipment		

SCHEDULE OF SPECIAL INSPECTION SERVICES					
PROJECT					
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT			
		Y/N	EXTENT	AGENT*	DATE COMPLETED
2. Verify reinforcement weldability of ASTM A615 reinforcement used to resist earthquake-induced flexural and axial forces in reinforced concrete special moment frames, special structural walls, and coupling beams connecting special structural walls	Review test reports	N	Each shipment		
<b>170 5.12.2 Structural Steel Testing and Qualification for Seismic Resistance</b>					
Test in accordance with the quality assurance requirements of AISC 341	Shop (3) and field testing	N	Per AISC 341		
<b>170 5.12.3 Seismic Certification of Nonstructural Components</b>					
Review certificate of compliance for designated seismic system components.	Certificate of compliance review	N	Each submittal		
<b>170 5.12.4 Seismic Isolation Systems</b>		N			
Test seismic isolation system in accordance with ASCE 7 Section 17.8	Prototype testing	N	Per ASCE 7		
<b>170 5.13 Sprayed Fire-resistant Materials</b>		N			
1. Verify surface condition preparation of structural members	Field inspection	N	Periodic		
2. Verify application of sprayed fire-resistant materials	Field inspection	N	Periodic		
3. Verify average thickness of sprayed fire-resistant materials applied to structural members	Field inspection	N	Periodic		
4. Verify density of the sprayed fire-resistant material complies with approved fire-resistant design	Field inspection and testing	N	Per IBC Section 1705.13.5		
5. Verify the cohesive/adhesive bond strength of the cured sprayed fire-resistant material	Field inspection and testing	N	Per IBC Section 1705.13.6		
<b>170 5.14 Mastic and Intumescent Fire-Resistant Coatings</b>		N			
Inspect mastic and intumescent fire-resistant coatings applied to structural elements and decks	Field inspection	N	Periodic		
<b>170 5.15 Exterior Insulation and Finish Systems (EIFS)</b>		N			
1. Verify materials, details and installations are per the approved construction documents	Field inspection	N	Periodic		
2. Inspection of water-resistive barrier over sheathing substrate	Field inspection	N	Periodic		
<b>170 5.16 Fire-Resistant Penetrations and Joints</b>		Y			
1. Inspect penetration firestop	Field testing	Y	Per ASTM E2174		
2. Inspect fire-resistant joint systems	Field testing	Y	Per ASTM E2393		

SCHEDULE OF SPECIAL INSPECTION SERVICES																				
PROJECT																				
MATERIAL / ACTIVITY	SERVICE	APPLICABLE TO THIS PROJECT																		
		Y/N	EXTENT	AGENT*	DATE COMPLETED															
<b>170 5.17 Smoke Control Systems</b>		Y																		
1. Leakage testing and recording of device locations prior to concealment	Field testing	Y	Periodic																	
2. Prior to occupancy and after sufficient completion, pressure difference testing, flow measurements, and detection and control verification	Field testing	Y	Periodic																	
<b>* INSPECTION AGENTS</b> <table border="1"> <thead> <tr> <th>FIRM</th> <th>ADDRESS</th> <th>TELEPHONE NO.</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td></td> <td></td> </tr> <tr> <td>2.</td> <td></td> <td></td> </tr> <tr> <td>3.</td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td></td> <td></td> </tr> </tbody> </table>						FIRM	ADDRESS	TELEPHONE NO.	1.			2.			3.			4.		
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1.																				
2.																				
3.																				
4.																				
<p><i>Notes: 1. The inspection and testing agent(s) shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official prior to commencing work. The qualifications of the Special Inspector(s) and/or testing agencies may be subject to the approval of the Building Official and/or the Design Professional.</i></p> <p>2. <i>The list of Special Inspectors may be submitted as a separate document, if noted so above.</i></p> <p>3. <i>Special Inspections as required by Section 1704.2.5 are not required where the fabricator is approved in accordance with IBC Section 1704.2.5.2</i></p> <p>4. <i>Observe on a random basis, operations need not be delayed pending these inspections. Perform these tasks for each welded joint, bolted connection, or steel element.</i></p> <p>5. <i>NOT of welds completed in an approved fabricator's shop may be performed by that fabricator when approved by the AHJ. Refer to AISC 360, N7.</i></p> <p>Are Requirements for Seismic Resistance included in the Statement of Special Inspections ?      <b>Yes</b> <b>No</b></p> <p>Are Requirements for Wind Resistance included in the Statement of Special Inspections ?      <b>Yes</b> <b>No</b></p> <p style="text-align: right;">DATE:</p>																				

COMMENTARY ON SCHEDULE OF SPECIAL INSPECTION SERVICES	
MATERIAL / ACTIVITY	COMMENTARY
<b>General</b>	Other items may be added to the Schedule of Special Inspection Services at the discretion of the Design Professional and/or the Owner.
Definition: Special Inspection	Inspection of construction requiring the expertise of an approved special inspector in order to ensure compliance with this code and the approved construction documents.
Definition: Special Inspector	A qualified person employed or retained by an approved agency and approved by the building official as having the competence necessary to inspect a particular type of construction requiring special inspection.
Definition: Continuous Special Inspection	Special inspection by the special inspector who is present when and where the work to be inspected is being performed.
Definition: Periodic Special Inspection	Special inspection by the special inspector who is intermittently present where the work to be inspected has been or is being performed.
<b>1704.2.5 Inspection of Fabricators</b>	Required where structural load-bearing members and assemblies are fabricated in a shop, except not required where fabricator is approved in accordance with section 1704.2.5.2. Where this exception is utilized, at the completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.
<b>1705.2 Steel Construction</b>	Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process.
5d. Non destructive testing (NDT) of welded joints	As a minimum for special inspections, AISC 360 Chapter N requires UT testing of complete joint penetration groove welds (CJP) subject to transversely applied tension loading in butt, T- and corner joints, in materials 5/16" (8mm) thick or greater. Further NDT testing, including UT testing of partial penetration groove welds (PJP) and magnetic particle or penetrant testing of fillet welds, may be added at the option of the engineer of record as a project requirement. AISC 360 Chapter N also allows reduction or increase in the rate of UT testing if approved by the engineer of record and by the authority having jurisdiction.
5d. 3, Non destructive testing of thermally cut surfaces of access holes.	This requirement is intended to apply when the flange thickness of rolled shapes exceeds 2" or when the web thickness of built up shapes exceeds 2". Any crack shall be deemed unacceptable regardless of size or location.
5d. 5, Review of fabricator's NDT reports.	NDT of welds completed in an approved fabricator's shop may be performed by that fabricator only when approved by the authority having jurisdiction. Special Inspections include review of reports of all NDT testing done by the fabricator.
<b>1705.2.2 Steel Construction Other Than Structural Steel</b>	
1. Inspection of welding	
a. Floor and roof cold-formed steel deck welds.	Per AWS D1.3.
b. Reinforcing Steel	Per AWS D1.4 and ACI 318 Section 3.5.2.
<b>1705.3 Concrete Construction</b>	Special Inspections are not required for certain isolated spread concrete footings, certain continuous concrete footings, nonstructural concrete slabs supported directly on the ground, and concrete foundation walls constructed in accordance with Table 1807.1.6.2. See Section 1705.3 for these specific exceptions. Special inspections are not required for any concrete patios, driveways and sidewalks, on grade.
Erection of precast concrete members.	Inspection of the erection of precast concrete has always been included in IBC, but no specific inspections have been indicated. Inspection of bolts and welds for precast concrete are covered in Section 1705.2 Steel Construction. Any specific precast erection inspection requirements should either be added to the project Special Inspection Schedule or Construction Documents. The following are some inspections that the Design Professional should consider:
	a. Verify member locations and joint details comply with construction and erection documents
	b. Verify proper bearing pad type and placement
	c. Verify placement of grout (including hot and cold weather procedures and that maximum specified number of levels to be placed before grouting are not exceeded)
	d. Verify joint widths are within specified tolerance where joints are to receive sealant

COMMENTARY ON SCHEDULE OF SPECIAL INSPECTION SERVICES	
MATERIAL / ACTIVITY	COMMENTARY
	e. Verify thread engagement and torque for mechanical connections
<b>1705.4 Masonry Construction</b>	Masonry construction shall be inspected and verified in accordance with TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 quality assurance program requirements. <b>Exceptions:</b> See 1705.5 Risk Categories: See 1604.5
1.Level A Quality Assurance	Masonry in Risk Category I, II, or III structures and designed in accordance with ACI 530 Chapter 5, 6, or 7 (Empirical Design, Veneer, Glass Unit Masonry)
2.Level B Quality Assurance	1.Masonry in Risk Category IV structures and designed in accordance with ACI 530 Chapter 6 or 7 (Veneer, Glass Unit Masonry) 2.Masonry in Risk Category I, II, or III structures and designed in accordance with ACI 530 Chapter 2, 3, 4, 8 or Appendix B (Allowable Stress Design, Strength Design, Prestressed Masonry, AAC Masonry, Masonry Infill)
3.Level C Quality Assurance	Masonry in Risk Category IV structures and designed in accordance with ACI 530 Chapter 2, 3, 4, 8 or Appendix B (Allowable Stress Design, Strength Design, Prestressed Masonry, AAC Masonry, Masonry Infill)
<b>1705.5 Wood Construction</b>	Special inspections of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. High-load diaphragms designed in accordance with Section 2306.2 shall be installed with special inspections as indicated in Section 1704.2. <b>Exception:</b> Special inspections are not required for portions of structures designed and constructed in accordance with IBC Section 2308 unless the approved construction documents indicate otherwise.
<b>1705.6 Soils</b>	The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance. Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.
<b>1705.7 Driven Deep Foundations</b>	The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.
<b>1705.8 Cast-in-Place Deep Foundations</b>	The approved geotechnical report, and the construction documents prepared by the registered design professionals, shall be used to determine compliance.
<b>1705.9 Helical Pile Foundations</b>	The approved geotechnical report, and the construction documents prepared by the registered design professional, shall be used to determine compliance.
<b>1705.10 Special Inspections for Wind Resistance</b>	Special inspections are required for buildings and structures constructed in the following areas: 1.In wind Exposure Category B, where $V_{asd}$ as determined in accordance with Section 1609.3.1 is 120 miles per hour (52.8 m/sec) or greater. 2.In wind Exposure Category C or D, where $V_{asd}$ as determined in accordance with Section 1609.3.1 is 110 mph (49 m/sec) or greater. <b>Exceptions:</b> 1.Structural wood Special Inspection is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main windforce-resisting system, where the fastener spacing is more than 4 inches on center. 2.Cold-formed steel light-frame construction Special Inspection is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply: the sheathing is gypsum or fiberboard; or the sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches on center.
<b>1705.11.1 Structural Steel Special Inspections for Seismic Resistance</b>	Mandatory in accordance with AISC 341 for the seismic force-resisting systems in Seismic Design Category C, D, E or F. <b>Exceptions:</b> 1.Structures assigned to Seismic Design Category C with structural steel systems not specifically detailed for seismic resistance with a Response Modification Coefficient, $R$ , of 3 or less, excluding cantilever column systems. 2.Exceptions listed in Sections 1704.2 and 1705.11.

COMMENTARY ON SCHEDULE OF SPECIAL INSPECTION SERVICES	
MATERIAL / ACTIVITY	COMMENTARY
<b>1705.11.2 Structural Wood Special Inspections for Seismic Resistance</b>	Mandatory for the seismic force-resisting systems in Seismic Design Category C, D, E or F. <b>Exceptions:</b> 1. Special inspection is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the seismic force-resisting system, where the fastener spacing of the sheathing is more than 4 inches on center. 2. Exceptions listed in Sections 1704.2 and 1705.11.
<b>1705.11.3 Cold-formed Steel Light-Frame Construction Special Inspections for Seismic Resistance</b>	Mandatory for the seismic-force-resisting systems in Seismic Design Category C, D, E or F. <b>Exceptions:</b> 1. Sheathing is gypsum board or fiberboard. 2. Sheathing is wood structural panel or steel sheet on only one side and the fastener spacing of the sheathing is more than 4 inches on center. 3. Exceptions listed in Sections 1704.2 and 1705.11.
<b>1705.11.4 Designated Seismic Systems Verification</b>	Definition, Designed Seismic Systems: Those nonstructural components that require design in accordance with ASCE 7 Chapter 13 and for which the component importance factor, $I_p$ , is greater than 1 in accordance with ASCE 7 <b>Section 13.1.3.</b>
Inspect and verify that the component label, and anchorage or mounting conforms to the certificate of compliance in accordance with <b>1705.12.3.</b>	Mandatory for structures assigned to Seismic Design Category C, D, E or F.
<b>1705.11.5 Architectural Components Special Inspections for Seismic Resistance</b>	
1. Inspection during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer.	Mandatory for structures assigned to Seismic Design Category D, E or F. <b>Exceptions:</b> 1. Not required for exterior cladding, interior and exterior nonbearing walls, and interior and exterior veneer 30 feet or less in height above grade or walking surface. 2. Not required for exterior cladding and interior and exterior veneers weighing 5 psf or less. 3. Not required for interior nonbearing walls weighing less than 15 psf.
2. Inspection during anchorage of access floors.	Mandatory for structures assigned to Seismic Design Category D, E or F.
<b>1705.11.6 Mechanical and Electrical Components Special Inspections for Seismic Resistance</b>	
1. Inspection during the anchorage of electrical equipment for emergency or standby power systems.	Mandatory for structures assigned to Seismic Design Category C, D, E or F.
2. Inspection during the anchorage of other electrical equipment	Mandatory for structures assigned to Seismic Design Category E or F.
3. Inspection during installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units.	Mandatory for structures assigned to Seismic Design Category C, D, E or F.
4. Inspection during the installation and anchorage of ductwork designed to carry hazardous materials.	
5. Inspection during the installation and anchorage of vibration isolation systems.	Mandatory for structures assigned to Seismic Design Category C, D, E or F, where the construction documents require a nominal clearance of 0.25 inches or less, between the equipment support frame and restraint.



COMMENTARY ON SCHEDULE OF SPECIAL INSPECTION SERVICES	
MATERIAL / ACTIVITY	COMMENTARY
<b>1705.11.7 Storage Racks Special Inspections for Seismic Resistance</b>	
Inspection during the anchorage of storage racks 8 feet or greater in height.	Mandatory for structures assigned to Seismic Design Category D, E or F.
<b>1705.11.8 Seismic Isolation Systems</b>	
Inspection during the fabrication and installation of isolator units and energy dissipation devices.	See ASCE 7 Section 17 for additional inspection and quality control requirements.
<b>1705.12.1 Concrete Reinforcement Testing and Qualification for Seismic Resistance</b>	Applies to special moment frames, special structural walls, and coupling beams connecting special structural walls in structures assigned to Seismic Design Category B, C, D, E or F. The reinforcement shall comply with ACI 318 Section 21.1.5.2, and if it is to be welded, also determine weldability in accordance with ACI 318 Section 3.5.2.
<b>1705.12.2 Structural Steel Testing and Qualification for Seismic Resistance</b>	Applies to structural steel systems designed to AISC 341 and assigned to Seismic Design Category C, D, E or F. This is not required for steel structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.
<b>1705.12.3 Seismic Certification of Nonstructural Components</b>	Applies to architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F and where the requirements of ASCE 7 Section 13.2.1 are met by submittal of manufacturer's certification, in accordance with Item 2.
Review certificate of compliance.	Review the construction documents for the requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with ASCE 7 Section 13.2.
<b>1705.12.4 Seismic Isolation Systems</b>	Test in accordance with ASCE 7 Section 17.8.
<b>1705.13 Sprayed Fire- Resistant Materials</b>	Inspect in accordance with ASTM E 605, ASTM E 736, and the written instructions of approved manufacturers.
Verify average thickness of sprayed fire-resistant materials applied to structural members.	Thickness testing required for minimum of 25% of structural members on each floor. See Section 1705.13 for testing requirements for floor, roof and wall assemblies.
<b>1705.14 Mastic and Intumescent Fire-Resistant Coatings</b>	
Inspect mastic and intumescent fire-resistant coatings applied to structural elements and decks.	Special inspections shall be in accordance with AWC 12-B. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents.
<b>1705.15 Exterior Insulation and Finish Systems (EIFS)</b>	
1. Verify materials, details and installations are per the approved construction documents.	Mandatory except for applications installed over masonry or concrete walls, or where installed over a water-resistive barrier with means of draining moisture to the exterior.
2. Inspect water-resistive barrier coating over sheathing substrate.	Mandatory where water-resistive barrier coating is installed over sheathing substrate.
<b>1705.16 Fire-Resistant Penetrations and Joints</b>	Mandatory in high-rise buildings or in buildings assigned to Risk Category III or IV in accordance with Section 1604.5.
<b>1705.17 Smoke Control Systems</b>	Mandatory by special inspection agencies having expertise in fire protection engineering, mechanical engineering and certification as air balancers.

**Contractor Affidavit under O.C.G.A. § 13-10-91(b)(1)**

The undersigned contractor ("Contractor") executes this Affidavit to comply with O.C.G.A. § 13-10-91 related to any contract to which Contractor is a party that is subject to O.C.G.A. § 13-10-91 and hereby verifies its compliance with O.C.G.A. § 13-10-91, attesting as follows:

- a) The Contractor has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program;
- b) The Contractor will continue to use the federal work authorization program throughout the contract period, including any renewal or extension thereof;
- c) The Contractor will notify the public employer in the event the Contractor ceases to utilize the federal work authorization program during the contract period, including renewals or extensions thereof;
- d) The Contractor understands that ceasing to utilize the federal work authorization program constitutes a material breach of Contract;
- e) The Contractor will contract for the performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the Contractor with the information required by O.C.G.A. § 13-10-91(a), (b), and (c);
- f) The Contractor acknowledges and agrees that this Affidavit shall be incorporated into any contract(s) subject to the provisions of O.C.G.A. § 13-10-91 for the project listed below to which Contractor is a party after the date hereof without further action or consent by Contractor; and
- g) Contractor acknowledges its responsibility to submit copies of any affidavits, drivers' licenses, and identification cards required pursuant to O.C.G.A. § 13-10-91 to the public employer within five business days of receipt.

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Contractor

**#2052-B Animal Shelter Construction**  
Name of Project

**Fayette County, Georgia**

\_\_\_\_\_  
Name of Public Employer

**I hereby declare under penalty of perjury that the foregoing is true and correct.**

Executed on \_\_\_\_\_, \_\_\_\_\_, 2022 in \_\_\_\_\_ (city), \_\_\_\_\_ (state).

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME  
ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 2022

\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires: \_\_\_\_\_

#### 8.1.4 GENERAL TERMS AND CONDITIONS

##### ITB #2052-A: Animal Shelter Construction

1. **Definitions:** The term “contractor” as used herein and elsewhere in these Terms and Conditions shall be used synonymously with the term “successful bidder.” The term “County” shall mean Fayette County, Georgia.
2. **Bid is Offer to Contract:** Each bid constitutes an offer to become legally bound to a contract with the County, incorporating the invitation to bid and the bidder’s bid. The binding offer includes compliance with all terms, conditions, special conditions, specifications, and requirements stated in the invitation to bid, except to the extent that a bidder takes written exception to such provisions. All such terms, conditions, special conditions, specifications, and requirements will form the basis of the contract. The bidder should take care to answer all questions and provide all requested information, and to note any exceptions in the bid submission. Failure to observe any of the instructions or conditions in this invitation to bid may result in rejection of the bid.
3. **Binding Offer:** To allow sufficient time for a contract to be awarded, each bid shall constitute a firm offer that is binding for sixty (60) days from the date of the bid opening to the date of award.
4. **Bidder’s Questions:** As appropriate, the County will post answers to questions and/or other information concerning the invitation to bid in the form of an addendum on the County’s website at [www.fayettecountyga.gov](http://www.fayettecountyga.gov). It is the responsibility of the prospective bidder to check the website for any addenda issued for this invitation to bid.
5. **References:** Include with your bid a list of three (3) jobs that your company has done that are of the same or similar nature to the work described in this invitation to bid, on the form provided. Include all information as requested on the form.
6. **More than One Bid:** Do not submit alternate bids or options, unless requested or authorized by the County in the Invitation to Bid. If a responder submits more than one bid without being requested or authorized to do so, the County may disqualify the bids from that responder, at the County’s option.
7. **Prices Held Firm:** Prices quoted shall be firm for the period of the contract, unless otherwise specified in the bid. All prices for commodities, supplies, equipment, or other products shall be quoted FOB Destination, Fayette County or job site.
8. **Brand Name:** If items in this invitation for bid have been identified, described, or referenced by a brand name or trade name description, such identification is intended to be descriptive, but not restrictive and is to indicate the quality and characteristics of products that may be offered. Alternative products may be considered for award if clearly identified in the bid. Items offered must meet required specifications and must be of a quality which will adequately serve the use

and purpose for which intended.

9. **Bidder Substitutions:** Bidders offering substitutions or deviations from specifications stated in the invitation to bid, shall list such substitutions or deviations on the “Exceptions to Specifications” sheet provided, or on a separate sheet to be submitted with the bid. The absence of such list shall indicate that the bidder has taken no exception to the specifications. The evaluation of bids and the determination as to equality and acceptability of products or services offered shall be the responsibility of the County.
10. **Samples:** When the County requires samples as part of the bid and vendor selection process, bidders must provide requested samples within the time allotted, and at no cost to the County unless otherwise specified. Any goods provided under contract shall conform to the sample submitted. The County will return samples only at the bidder’s request, and at the bidder’s expense, if they are not destroyed by testing.
11. **Non-Collusion:** By responding to this invitation to bid, the bidder represents that the bid is not made in connection with any competing bidder, supplier, or service provider submitting a separate response to this invitation to bid and is in all respects fair and without collusion or fraud.
12. **Bid Evaluation:** Award will be made to the lowest responsive, responsible bidder, taking into consideration payment terms, vendor qualifications and experience, quality, references, any exceptions listed, and/or other factors deemed relevant in making the award. The County may make such investigation as it deems necessary to determine the ability of the bidder to perform, and the bidder shall furnish to the County all information and data for this purpose as the County may request. The County reserves the right to reject any bid item, any bid, or all bids, and to re-advertise for bids.
13. **Payment Terms and Discounts:** The County’s standard payment terms are Net 30. Any deviation from standard payment terms must be specified in the resulting contract, and both parties must agree on such deviation. Cash discounts offered will be a consideration in awarding the bid, but only if they give the County at least 15 days from receipt of invoice to pay. For taking discounts, time will be computed from the date of invoice acceptance by the County, or the date a correct invoice is received, whichever is the later date. Payment is deemed made, for the purpose of earning the discount, on the date of the check.

14. **Trade Secrets – Confidentiality:** If any person or entity submits a bid or proposal that contains trade secrets, an affidavit shall be included with the bid or proposal. The affidavit shall declare the specific included information which constitutes trade secrets. Any trade secrets must be either (1) placed in a separate envelope, clearly identified, and marked as such, or (2) at a minimum, marked in the affidavit or an attached document explaining exactly where such information is, and otherwise marked, highlighted, or made plainly visible. See O.C.G.A. § 50-18-72 (A)(34).
15. **Trade Secrets – Internal Use:** In submitting a bid, the bidder agrees that the County may reveal any trade secret materials contained in the bid to all County staff and officials involved in the selection process, and to any outside consultant or other third parties who may assist in the selection process. The bidder agrees to hold harmless the County and each of its officers, employees, and agents from all costs, damages, and expenses incurred in connection with refusing to disclose any material which the bidder has designated as a trade secret.
16. **Contract Execution & Notice to Proceed:** After the Board of Commissioners makes an award, all required documents are received by the County, and the contract is fully executed with signature of both parties, the County will issue a written Notice to Proceed. The County shall not be liable for payment of any work done or any costs incurred by any bidder prior to the County issuing the Notice to Proceed.
17. **Insurance:** The successful bidder shall procure and maintain the following insurance, to be in effect throughout the term of the contract, in at least the amounts and limits as follows:
- a. **General Liability Insurance:** \$1,000,000 combined single limit per occurrence, including bodily and personal injury, destruction of property, and contractual liability.
  - b. **Automobile Liability Insurance:** \$1,000,000 combined single limit each occurrence, including bodily injury and property damage liability.
  - c. **Worker’s Compensation & Employer’s Liability Insurance:** Workers Compensation as required by Georgia statute.
  - d. **Builder’s “All Risk” Insurance:** In the event the contractor is performing construction services under the contract, contractor shall procure and maintain “all-risk” builder’s insurance, providing coverage for the work performed under the contract, and the materials, equipment or other items incorporated therein, while the same are located at the construction site, stored off-site, or at the place of manufacture. The policy limit shall be at least 100% of the value of the contract, including any additional costs which are normally insured under such policy.

Before a contract with the successful bidder is executed, the successful bidder shall provide Certificates of Insurance for all required coverage. The successful offeror can provide the Certificate of Insurance after award of the contract, but must be provided prior to execution of the contract document by both parties. The certificate shall list an additional insured as follows:

Fayette County, Georgia  
140 Stonewall Avenue West  
Fayetteville, GA 30214

18. **Bid Bond:** You must include a bid bond with your bid, equal to five percent (5%) of the total amount bid. Bid bonds shall be provided by a surety which appears on Georgia's list of approved sureties administered by the State Insurance Commissioner, or the U.S. Treasury's list of approved bond sureties (Circular 570).
19. **Performance and Payment Bonds:** Prior to execution of a contract, the successful bidder shall submit performance and payment bonds each equal to 100 percent of the contract value, provided by a surety which appears on Georgia's list of approved sureties administered by the State Insurance Commissioner, or the U.S. Treasury's list of approved bond sureties (Circular 570).
20. **Building Permits:** Work performed for the County requiring building permits by licensed contractors will not have permit fees assessed, although any re-inspection fees for disapproved inspections will be the responsibility of the contractor prior to final inspections and the Certificate of Occupancy or Certificate of Completion being issued. Plans, calculations, and accompanying documents must be presented in a clear, legible, and organized manner conducive for plan review. Plans shall be numbered, and a Table of Contents provided for reference with only the plan sheets listed. No applications, plans or documents will be accepted by mail. All plans, specifications and calculations prepared by a licensed professional shall be sealed, signed, and dated. Engineering calculations must be included with each set of plans for Pre-engineered trusses. Energy code compliance calculations must be included with each set of plans. **COMcheck:** The provided energy compliance evaluation and worksheets for Envelope, Mechanical, Lighting, and Plumbing shall be verified and submitted with the construction documents to Fayette County prior to permit issuance (Exhibit 3 in Plans).
21. **Unauthorized Performance:** The County will not compensate the contractor for work performed unless the work is authorized under the contract, as initially executed or as amended.
22. **Assignment of Contract:** Assignment of any contract resulting from this invitation to bid will not be authorized, except with express written authorization from the County.
23. **Severability:** The invalidity of one or more of the phrases, sentences, clauses or sections contained in the contract shall not affect the validity of the remaining portion of the contract. If any provision of the contract is held to be unenforceable, then both parties shall be relieved of all obligations arising under such provision to the extent that the provision is unenforceable. In such case, the contract shall be deemed amended to the extent necessary to make it enforceable while preserving its intent.



24. **Delivery Failures:** If the contractor fails to deliver contracted goods or services within the time specified in the contract or fails to replace rejected items in a timely manner, the County shall have authority to make open-market purchases of comparable goods or services. The County shall have the right to invoice the contractor for any excess expenses incurred, or deduct such amount from monies owed the contractor. Such purchases shall be deducted from contracted quantities.
25. **Substitution of Contracted Items:** The contractor shall be obligated to deliver products awarded in this contract in accordance with terms and conditions specified herein. If a contractor is unable to deliver the products under the contract, it shall be the contractor's responsibility to obtain prior approval of the ordering agency to deliver an acceptable substitute at the same price quoted in the contractor's original bid. In the event any contractor consistently needs to substitute or refuses to substitute products, the County reserves the right to terminate the contract or invoke the "Delivery Failures" clause stated herein.
26. **Inspection and Acceptance of Deliveries:** The County reserves the right to inspect all goods and products delivered. The County will decide whether to accept or reject items delivered. The inspection shall be conclusive except with respect to latent defects, fraud, or such gross mistakes as shall amount to fraud. Final inspection resulting in acceptance or rejection of the products will be made as soon as practicable, but failure to inspect shall not be construed as a waiver by the County to claim reimbursement or damages for such products which are later found to be in non-conformance with specifications. Should public necessity demand it, the County reserves the right to use or consume articles delivered which are substandard in quality, subject to an adjustment in price to be determined by the Purchasing Director.
27. **Force Majeure:** Neither party shall be deemed to be in breach of the contract to the extent that performance of its obligations is delayed, restricted, or prevented by reason of any act of God, natural disaster, act of government, or any other act or condition beyond the reasonable control of the party in question.

28. **Governing Law:** This agreement shall be governed in accordance with the laws of the State of Georgia. The parties agree to submit to the jurisdiction in Georgia, and further agree that any cause of action arising under this agreement shall be required to be brought in the appropriate venue in Fayette County, Georgia.

**8.1.5 SUPPLEMENTARY TERMS AND CONDITIONS**  
**ITB #2052-B: Animal Shelter Construction**

These Supplementary Conditions amend or supplement the Standard Form of Agreement Between Owner and Contractor and the General Conditions of the Contract for Construction. All provisions that are not so amended or supplemented remain in full force and effect.

1. Document A101<sup>®</sup>-2017:
  - a. Delete 8.5.1 in its entirety.
2. Document A201<sup>™</sup>-2017:
  - a. Delete Article 11.2 through 11.5 in its entirety.
3. Document A701<sup>™</sup>-2018:
  - a. Delete Paragraph 3.2.2 in its entirety and insert the following in its place:  
“Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Fayette County Purchasing Department by the date and time listed on the Bid Notice.”
  - b. Delete Article 4.2 Bid Security in its entirety.
  - c. Delete 6.2 Owner’s Financial Capability in its entirety.
  - d. Delete 8.1.2 in its entirety.
  - e. Add 8.1.4 General Terms and Conditions.
  - f. Add 8.1.5 Supplementary Terms and Conditions.

# NPDES INSPECTIONS

The contractor shall be responsible for all NPDES inspections, sampling and record-keeping per the NPDES Construction Stormwater General Permit for Standalone Projects (GAR 100001), as noted in the approved plans on sheets 8-12 (GASWCC Checklist items 30, 31 and 32) for the duration of the project, and until the Notice of Termination has been accepted by Georgia EPD.

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SECTION 002513  
PREBID MEETING

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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002513-1

DOCUMENT 002513 - PREBID MEETINGS

1.1 PREBID MEETING

A. **Architect** will conduct a Prebid meeting as indicated below:

1. Mandatory Meeting Date: Wednesday, September 21, 2022
2. Meeting Time: 10:00 a.m., local time.
3. Location: 1155 Highway 74 South, Peachtree City, GA 30269

B. Attendance:

1. Prime Bidders: Attendance at Prebid meeting is REQUIRED.
2. Subcontractors: Attendance at Prebid meeting is recommended.

C. Bidder Questions: The pre-bid meeting is to allow bidder to see the site and existing conditions. All questions regarding the drawings and project manual are to be addressed to [nduggan@fayettecountyga.gov](mailto:nduggan@fayettecountyga.gov)

SECTION 002513  
PREBID MEETING

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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END OF DOCUMENT 002513

SECTION 011113  
SUMMARY OF THE WORK

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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011113-1

1.1 RELATED DOCUMENTS

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

1.2 PROJECT DESCRIPTION

- A. The Project consists of the construction of a new Animal Shelter for Fayette County. The facility is a 6,000 s.f. one-story building with slab-on-grade foundation, post-frame structure with wood stud framing, wood trusses, metal panel and stone exterior walls and metal roof. Refer to the drawings and project manual as prepared by CARTER WATKINS ASSOCIATES ARCHITECTS, INC. Contracting shall be by means of a General Contractor for Construction between one General Contractor and Fayette County.

B. SPECIAL NOTES –

1. The Standard of Design for the post-frame structure is Morton Buildings, Inc. Contractor shall provide details shop drawing submittals from Morton, FBI, or other companies. The Shop Drawings shall include all structure, framing, trusses, exterior construction and finishes, wall purlins, ceiling framing, and all exterior finishes, accessories, wall panels, roof panels, stone wainscot, doors, windows, porches and structure, louvers, vents, etc..
2. Note that the Kennels and equipment, labeled A, B, D, E, F, L, M, P, and R will be part of the base bid. Contractor is responsible for coordinating all preparation work for these items, brings power, plumbing, etc. to the locations, and coordinating the installation.
3. Cat Condos labeled K are owned by the County. Contractor shall remove from existing shelter and install in new shelter in location designated on the plan. Cat Condo installation shall be coordinated with the Animal Shelter Director. The condos are being used currently and shall be moved as close to final inspection as possible.
4. Items C, N, O, and Q are to be provided and installed by the Contractor.
5. Items G, H, and J are to be provided by the Owner and installed by the Contractor.

1.3 CONTRACTORS USE OF PREMISES

- A. General: Limit use of the premises only to construction activities in areas indicated.

SECTION 011113  
SUMMARY OF THE WORK

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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to be disturbed.

2. Keep driveways and entrances serving the premises and the park grounds clean and available to the Owner. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
3. Contractor to be responsible for all testing including materials, compaction, concrete, etc.
4. Contractor to provide third-party Special Inspections on all structural elements, connections, and all items required, by Fayette County, to have Special Inspections.

END OF SECTION

SECTION 01 21 13

ALLOWANCES

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

012113-1

FAYETTE COUNTY ANIMAL SHELTER

AUGUST 15, 2020

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PART 1 - GENERAL

ALLOWANCES ARE AS FOLLOWS (IF ANY):

1. Hardware Allowance: (allowance to provide for the purchase of hardware materials only. Labor, preparation, etc. to be included in base bid amount). Figures below are not inclusive of Access Control and do not apply to specialty doors (Detention, Vault doors, etc.)  
  
    \$ 800.00 per interior door leaf maximum  
    \$ 1,200 per exterior door leaf maximum
2. Provide a \$60,000.00 allowance for access control, fire alarms and complete camera security system. Cabling is to be included in the Base Bid. Refer to Plans Exhibits 1 & 2 for conduit placement. Adapt To Solve and Ultimate Security are Fayette County's vendors for these items and shall be used for all access control, fire alarms, and camera security. Awarded contractor shall contact and coordinate installation of the access control, fire alarms and camera security systems.
3. Signage Allowance: \$1,000 allowance for construction project signage .
4. A \$60,000 General Contingency allowance is included on the Bid Summary Form. This may only be used with written authorization of the County Administrator in the form of a change order.

END OF SECTION

SECTION 01 23 00

ALTERNATES

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

01 23 00-1

FAYETTE COUNTY ANIMAL SHELTER

AUGUST 05, 2020

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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for Alternates.
- B. Definition: an Alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in Contract Documents.
- C. Coordination: Coordinate related Work and modify or adjust adjacent work as necessary to ensure that work affected by each accepted Alternate is complete and fully integrated into the project.
- D. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
- E. Schedule: Specification Sections contain requirements for materials and methods necessary to achieve the work described under each Alternate.

Alternate Additions/Deductions to the Base Bid Refer to Addendums for future alternates.

1. Provide a roof slope of 6:12 versus 4:12 shown for main gable roof. (this is to provide additional height at Mechanical Platform).
2. If Determined to be required, Provide complete Automatic Extinguishing Sprinkler System in conformance with NFPA 72. Provide 8" Fire line, complete fire fault with electronic monitoring of O, S, and Y valves and equipment, back flow preventer, sprinkler Riser room to be built (door and wall) in Storage 102 along the front wall of the building. Provide complete sprinkler system as required by the Peachtree City Fire Marshal including attic protection.
3. Provide R-49 spray-foam insulation at all attic exterior surfaces including the underside of the roof and at gable ends in lieu of the batt insulation shown.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION



**SECTION 01 25 13**  
**PRODUCT SUBSTITUTIONS**

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

01 25 13-1

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to produce specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment."

**1.3 DEFINITIONS**

- A. Definitions used in the Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:

1. Revisions to Contract Documents requested by the Owner or Architect.
2. Specified options of products and construction methods included in Contract Documents.
3. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

**1.4 SUBMITTALS**

- A. Substitution Request Submittal: Requests for substitution will be considered if received within 15 days after commencement of the work. Requests received more than 15 days after commencement Of the Work may be considered or rejected at the discretion of the Architect.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
2. The Architect will consider only those requests accompanied by a copy of the Request

SECTION 01 25 13  
PRODUCT SUBSTITUTIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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for Substitution form bound herein, filled out completely, signed, and including the required attachments.

3. Architect's Action: Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

**PART 2 - PRODUCTS**

**2.1 SUBSTITUTIONS**

- A. Conditions: The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted.
4. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.
5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
6. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
8. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be

SECTION 01 25 13  
PRODUCT SUBSTITUTIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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coordinated.

9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

- B. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable)

SECTION 01 25 13  
PRODUCT SUBSTITUTIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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01 25 13-4

PROPOSED REQUEST FOR SUBSTITUTION

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FROM: \_\_\_\_\_  
Name of Manufacturer  
\_\_\_\_\_  
Street Address  
\_\_\_\_\_  
City and State

\_\_\_\_\_  
Phone number and name of person to contact

PROJECT: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1. Specification Section and Paragraph numbers of product specified

\_\_\_\_\_.

2. Proposed Substitute

A. Name and Model No:

B. Description:

C. Attach applicable Submittals as required by the referenced Specification Section, i.e. Product Data, Materials List, Shop Drawings, Samples, Design Data, Test Reports, and Certificates. Attach Shop Drawings to the effect of the proposed substitution on adjacent components of the work.

SECTION 01 25 13  
PRODUCT SUBSTITUTIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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- D. Insert Numbers of applicable reference standards:
  - E. Attach a color chart; if applicable.
  - F. Attach installation instructions.
3. Manufacturer's Reputation: Attach the following:
- A. Evidence of reputation for prompt delivery.
  - B. Evidence of reputation for efficiency in servicing products.
4. Comparison: Attach an itemized comparison of the proposed substitution with product specified. Significant qualities may include elements such as size, weight, durability, performance, and visual effects.
5. Changes in Work: Attach data relating to changes required in other work to permit use of proposed substitution and changes required in construction schedule and overall contract time. Coordinate changes or modifications needed to other parts of the work and to construction performed by the Owner and separate Contractors that will be necessary to accommodate the proposed substitution.
6. Cost Data: Attach accurate cost data on proposed substitution in comparison with product specified.
7. Previous Installation: Provide the following information on similar projects on which proposed substitution was used, list projects in the locale of the project primarily and then in other areas that best represent its application on this project:

Name and Address of Project	Date of Installation	Name, Address and Phone Number of Architect
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- A.
- B.
- C.
- D.

SECTION 01 25 13  
PRODUCT SUBSTITUTIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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8. In making a request for substitution, the Manufacturer, Installer, and Contractor each represents that:

- A. He has examined the Drawings and Specifications and has determined that, to the best of his knowledge, the proposed substitution is appropriate for the use intended in the Drawings and Specifications.
- B. He will provide the same or better warranty for substitution as for product or method specified.
- C. The product is equal or better in quality and serviceability to the specified item.

9. In making a request for substitution, the Installer and Contractor each represents that:

- A. He will coordinate the installation of accepted substitution into the work, making such changes as may be required for the work to be complete in all respects.
- B. He waives all claims for additional costs related to substitution which consequently become apparent.
- C. Cost data is complete and includes all related costs under his Contract, but excludes costs under separate contracts and the Architect's redesign costs.
- D. The substitution meets the requirements of the Contract Documents, regardless of the evidence submitted or any review or independent investigation by the Owner or the Architect.

---

Name of Manufacturer and signature of Manufacturer's Rep      Date

---

Name of Installer and signature of Installer's Rep      Date

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Name of Contractor and signature of Contractor's Rep      Date

END OF SECTION



SECTION 01 26 00  
MODIFICATION PROCEDURES

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

01 26 00-1

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

- A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on AIA form G710, Architect's Supplemental Instructions.

1.4 CHANGE ORDER PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
1. Proposal requests issued by the Architect are for information only. Do not consider them instruction either to stop work in progress, or to execute the proposed change.
  2. Unless otherwise indicated in the proposal request, within 20 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.
    - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade

SECTION 01 26 00  
MODIFICATION PROCEDURES

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
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discounts.

- c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

B. Contractor-Initiated Change Order Proposals: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a change proposal to the Architect.

- 1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
- 2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
- 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- 4. Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.

**1.5 ALLOWANCES**

A. Allowance Adjustment: Base each Change Order Proposal for an allowance cost adjustment solely on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

**1.6 CONSTRUCTION CHANGE DIRECTIVE**

A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA for G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

- 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

SECTION 01 26 00  
MODIFICATION PROCEDURES

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1.7 CHANGE ORDER PROCEDURES

- A. Upon the Owner's approval of a Change Order Proposal, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 29 00  
APPLICATION FOR PAYMENT

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1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1. Submit the Schedule of Values to the Architect at the earliest feasible date, but in no case later than 7 days before the date scheduled for submittal of the initial Application for Payment.

- B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

1. Identification: Include the following Project Identification on the Schedule of Values:

- a. Project name
- b. Name of the Architect
- c. Project number
- d. Contractor's name and address
- e. Date of submittal

2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

- a. Generic name
- b. Related Specification Section
- c. Name of subcontractor
- d. Name of Manufacturer or fabricator

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APPLICATION FOR PAYMENT

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- e. Name of supplier
  - f. Change Orders (numbers) that have affected value
  - g. Dollar value
  - h. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent

- 3. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

**1.4 APPLICATIONS FOR PAYMENT:**

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
- B. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Application for payment.
- D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
- E. Transmittal: Submit 3 executed copies of each Application for Payment to the Architect by means ensuring receipt within 24 hours.
- F. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
- G. Administrative actions and submittals that shall proceed or coincide with this application include:
  - 1. Occupancy permits and similar approvals
  - 2. Warranties (guarantees) and maintenance agreements
  - 3. Test/adjust/balance records
  - 4. Maintenance instructions
  - 5. Meter readings
  - 6. Start-up performance reports
  - 7. Change-over information related to Owner's occupancy, use, operation, and maintenance.
  - 8. Final cleaning

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APPLICATION FOR PAYMENT

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- 9. Application for reduction of retainage, and consent of surety
  - 10. Advice on shifting insurance coverages
  - 11. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial completion.
- H. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
- 1. Completion of Project closeout requirements
  - 2. Completion of items specified for completion after Substantial Completion
  - 3. Assurance that unsettled claims will be settled
  - 4. Assurance that Work not complete and accepted will be completed without undue delay
  - 5. Transmittal of required Project construction records to Owner
  - 6. Certified property survey.
  - 7. Proof that taxes, fees, and similar obligations have been paid
  - 8. Release of liens
  - 9. Removal of temporary facilities and services
  - 10. Removal of surplus materials, rubbish, and similar elements
  - 11. Change of door locks to Owner's access

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

**SECTION 01 31 13**  
**PROJECT COORDINATION**

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
1. Coordination
  2. General installation provisions
  3. Cleaning and protection

**1.3 COORDINATION**

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
1. Where installation of one part of the work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the work.

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

**PART 3 - EXECUTION**

**3.1 GENERAL INSTALLATION PROVISIONS**

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations,



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**PROJECT COORDINATION**

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to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

**3.2 CLEANING AND PROTECTION**

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

**END OF SECTION**

SECTION 01 31 19  
PROJECT MEETINGS

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PART 1 - GENERAL

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
  - 1. Pre-Construction Conference
  - 2. Progress Meetings – to be held every other week at an agreed-upon time/date.
- B. Construction schedules are specified in another Division-1 Section.

**1.3 PRE-CONSTRUCTION CONFERENCE**

- A. Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 15 days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
  - 1. Tentative construction schedule
  - 2. Critical Work sequencing
  - 3. Designation of responsible personnel
  - 4. Procedures for processing field decisions and Change Orders
  - 5. Procedures for processing Applications for Payment
  - 6. Distribution of Contract Documents
  - 7. Submittal of Shop Drawings, Product Data and Samples
  - 8. Preparation of record documents
  - 9. Use of the premises
  - 10. Office, Work, and storage areas
  - 11. Equipment deliveries and priorities
  - 12. Safety procedures
  - 13. First aid
  - 14. Security
  - 15. Housekeeping

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PROJECT MEETINGS

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16. Working hours

1.4 PROGRESS MEETINGS

- A. Conduct progress meetings with subcontractors at weekly intervals. Provide the Owner and Architect minutes of the meetings via email. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the General Contractor, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.
  - 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - 2. Review the present and future needs of each entity present, including such items as:
    - a. Interface requirements
    - b. Time
    - c. Sequences
    - d. Deliveries
    - e. Off-site fabrication problems
    - f. Access
    - g. Site utilization
    - h. Temporary facilities and services
    - i. Hours of Work
    - j. Hazards and risks
    - k. Housekeeping
    - l. Quality and Work standards
    - m. Change Orders
    - n. Documentation of information for payment requests
    - o. Pre-installation discussions

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PROJECT MEETINGS

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- D. Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Also, send the minutes to the Architect, via email, and include a brief summary, in narrative form, of progress since the previous meeting and report.
1. Schedule Updating: Revise the construction schedule after each progress meeting where revision to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

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## SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Preconstruction photographs.
  - 2. Periodic construction photographs.
  - 3. Final completion construction photographs.
- B. Related Requirements:
  - 1. Section 017000 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
  - 2. Section 311000 "Site Clearing" for photographic documentation before site clearing operations commence.

#### 1.2 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within three days of taking photographs.
  - 1. Submit photos on a **flash drive or USB**. Include copy of key plan indicating each photograph's location and direction.
  - 2. Identification: Provide the following information with each image description in file metadata tag:
    - a. Name of Project.
    - b. Name and contact information for photographer.
    - c. Name of Owner and Architect.

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- d. Name of Contractor.
- e. Date photograph was taken.
- f. Description of location, vantage point, and direction.
- g. Unique sequential identifier keyed to accompanying key plan.

### 1.3 QUALITY ASSURANCE

### 1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

### 1.5 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs with maximum depth of field and in focus.
  - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
  - 1. Flag construction limits before taking construction photographs.
  - 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
  - 3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
  - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

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- D. Periodic Construction Photographs: Take 20 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Final Completion Construction Photographs: Take 100 photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013233



## SECTION 01 33 00

### SUBMITTALS

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#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the work, including:
  - 1. Contractor's construction schedule
    - 2. Daily construction reports
    - 3. Shop Drawings
    - 4. Product Data
    - 5. Samples
- B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
  - 1. Permits
  - 2. Applications for payment
  - 3. Performance and payment bonds
  - 4. Insurance certificates
  - 5. List of Subcontractors
- C. The Schedule of Values submittal is included in Section "Applications for Payment."
- D. Shop drawings for pole-framed structure including all structural elements, framing, exterior framing, roofing, siding, trim, doors, windows, accessories, columns, porch framing, etc. Shop drawings to have Georgia Registered Engineer's stamp.

##### 1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

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### SUBMITTALS

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- a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
    - a. Allow three weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    - b. If an intermediate submittal is necessary, process the same as the initial submittal.
    - c. Allow two weeks for reprocessing each submittal.
    - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
  1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
  2. Include the following information on the label for processing and recording action taken.
    - a. Project name
    - b. Date
    - c. Name and address of Architect
    - d. Name and address of Contractor
    - e. Name and address of subcontractor
    - f. Name and address of supplier
    - g. Name of manufacturer
    - h. Number and title of appropriate Specification Section
    - i. Drawing number and detail references, as appropriate
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
  1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

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- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
- B. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

#### 1.5 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
1. Dimensions
  2. Identification of products and materials included
  3. Compliance with specified standards
  4. Notation of coordination requirements
  5. Notation of dimensions established by field measurement.
  6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings of sheets at least 8 1/2" x 11" but no larger than 30" x 42".
  7. Initial Submittal: Submit one correctable translucent reproducible print and two blue or black-line print for the Architect's review; the reproducible print will be returned.
  8. Final Submittal: Submit three blue or black-line prints; submit 5 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.
  9. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. SPECIFIC SHOP DRAWINGS TO BE SUBMITTED, IN ADDITION TO CUSTOMARY ITEMS, ARE AS FOLLOWS:

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1. Engineered Wood Truss Shop drawings with Georgia Registered Engineer's Stamp.
  2. Steel Stud Shop drawings with Georgia Registered Engineer's Stamp.
  3. Parking and sidewalk layout shop drawing.
  4. Roofing, flashing, and coping shop drawings.
  5. Millwork and Cabinetry.
  6. Interior Finishes.
  7. HVAC, Plumbing, and Electrical.

#### 1.6 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
  - a. Manufacturer's printed recommendations
  - b. Compliance with recognized trade association standards
  - c. Compliance with recognized testing agency standards
  - d. Application of testing agency labels and seals
  - e. Notation of dimensions verified by field measurement
  - f. Notation of coordination requirements
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
4. Submittals: Submit 3 copies of each required submittal; submit 5 copies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.
  - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
  - a. Do not proceed with installation until an applicable copy of Product Data applicable is

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### SUBMITTALS

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in the installer's possession.

- b. Do not permit use of unmarked copies of Product Data in connection with construction.

#### 1.7 SAMPLES

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
  - 1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:
    - a. Generic description of the Sample
    - b. Sample source
    - c. Product name or name of manufacturer
    - d. Compliance with recognized standards
    - e. Availability and delivery time
  - 2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
    - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.
    - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
    - c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
  - 3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
    - a. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
  - 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

## SECTION 01 33 00

### SUBMITTALS

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- 5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
    - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
    - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
  - B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

#### 1.8 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
  - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
  - 1. Final Unrestricted Release: Where submittals are marked "Approved" or "No Exceptions Taken" that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance. This does NOT preclude the Contractor from following the Construction Documents in any way. This does not comprise the Architect's "approval" of the submittal, other than for a cursory review, and does not allow the contractor to deviate from the documents in any fashion. It is simply a courtesy review of the submittal. The Architect has outlined the project in the Construction Document and any variation is taken at the Contractor's risk.
- C. Final-But-Restricted Release: When submittals are marked "Make Corrections Noted" that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
- D. Returned for Resubmittal: When submittal is marked "Rejected, Resubmit," do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

- a. Do not permit submittals marked "Rejected, Resubmit" to be used at the Project site,

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or elsewhere where Work is in progress.

**PART 2 - ENERGY CONSERVATION**

1. Submit energy conservation calculations per the International Energy Conservation Code or ASHRAE 90.1 2007

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

END OF SECTION



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REFERENCE STANDARDS AND DEFINITIONS

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the General Conditions.
- B. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
- C. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Architect", "requested by the Architect," and similar phrases.
- D. Approve: The term "approved," where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in General and Supplementary Conditions.
- E. Regulation: The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."
- G. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."
- H. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."
- I. Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
1. The term "experienced" when used with the term "Installer" means having a minimum of 5 previous Projects similar in size and scope to this Project, being familiar with the precautions required, and having complied with requirements of the authority having jurisdiction.
  2. Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic

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name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

3. Assignment of Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or opinion. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

a. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

- J. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

- K. Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Where the date of issue of a referenced standard is not specified, comply with The standard in effect as of date of Contract Documents.
- C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.
1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as

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appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

- D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.
  2. Although copies of standards needed for enforcement of requirements may be included as part of required submittals, the Architect reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.
- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

**1.4 GOVERNING REGULATIONS/AUTHORITIES**

- A. The Architect has contacted authorities having jurisdiction where necessary to obtain information necessary for preparation of Contract Documents; that information may or may not be of significance to the Contractor. Contact authorities having jurisdiction directly for information and decisions having a bearing on the Work.

**1.5 SUBMITTALS**

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

**SECTION 01 43 13**  
**MATERIALS AND EQUIPMENT**

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions."

**1.3 DEFINITIONS**

- A. Definitions used in the Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
    - a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
  2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
  3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

**1.4 QUALITY ASSURANCE**

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or

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compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.

- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to View in occupied spaces or on the exterior.
  - 1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
  - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
    - a. Name of product and manufacturer
    - b. Model and serial number
    - c. Capacity
    - d. Speed
    - e. Ratings

**1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
  - 1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
  - 3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
  - 4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
  - 5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
  - 6. Store heavy materials away from the Project structure in a manner that will not endanger the

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supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

**PART 2 - PRODUCTS**

**2.1 PRODUCT SELECTION**

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
  1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
  2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
  1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. Substitutions will be permitted, if approved equal.
  2. Semi-proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. Substitutions will be permitted, if approved equal.
  3. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
  4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
    - a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
  5. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
  6. Visual Matching: Where Specifications require matching an established Sample, the Architect's

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decision will be final on whether a proposed product matches satisfactorily.

- a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.
- 7. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.
- 8. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division-1 for allowances that control product selection, and for procedures required for processing such selections.

**PART 3 - EXECUTION**

**3.1 INSTALLATION OF PRODUCTS**

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work.
  - 1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

**END OF SECTION**



**SECTION 01 51 00**  
**TEMPORARY FACILITIES**

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
  - 1. Water service and distribution
  - 2. Temporary electric power and light
  - 3. Telephone service.
  - 4. Internet Service with email, Computer, and Printer.
- C. Temporary construction and support facilities required include but are not limited to:
  - 1. Temporary heat
  - 2. Field offices and storage sheds
  - 3. Sanitary facilities, including drinking water
  - 4. Temporary enclosures
  - 5. Elevator use
  - 6. Temporary Project identification signs and bulletin boards
  - 7. Waste disposal services
  - 8. Rodent and pest control
  - 9. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include but are not limited to:
  - 1. Temporary fire protection
  - 2. Barricades, warning signs, lights
  - 3. Environmental protection

**1.3 SUBMITTALS**

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

**1.4 QUALITY ASSURANCE**

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:

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- 1. Building Code requirements
  - 2. Health and safety regulations
  - 3. Utility company regulations
  - 4. Police, Fire Department and Rescue Squad rules
  - 5. Environmental protection regulations
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
- 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
  - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

**1.5 PROJECT CONDITIONS**

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
  - B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
- 1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.
  - 2. For signs and directory boards, provide exterior type, Grade B-B high Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
  - 3. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.

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- C. Gypsum Wallboard: Provide gypsum wallboard complying with requirements of ASTM C 36 on interior walls of temporary offices.
  - D. Paint: Comply with requirements of Division 9 Section "Painting".
    - 1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
    - 2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
    - 3. For interior walls of temporary offices, provide two coats interior latex flat wall paint.
  - E. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
  - F. Water: Provide potable water approved by local health authorities.

**2.2 EQUIPMENT**

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

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- I. First Aid Supplies: Comply with governing regulations.
  - J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
    - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

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

**3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Connect to existing service.
- B. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
  - 1. Sterilization: Sterilize temporary water piping prior to use.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
  - 1. Except where overhead service must be used, install electric power service underground.
  - 2. Power Distribution System: Install wiring overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, AC 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- D. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.

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1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.
1. At each telephone, post a list of important telephone numbers.

**3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES**

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.
1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- E. Field offices: Provide insulated, weather-tight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
- F. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- G. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

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- H. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
- I. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.
1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7 to 13 deg C).
- J. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq feet or less with plywood or similar materials.
  3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
  4. Where temporary wood or plywood enclosure exceeds 100 sq ft in area, use UL-labeled fire-retardant treated material for framing and main sheathing.
- K. Temporary Elevator Use: Use of Service Elevator for movement of materials and personnel is permitted.
- L. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
  2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- M. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

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- N. Rodent and Pest Control: Retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be relatively free of pests and their residues at Substantial Completion. Perform control operations in a lawful manner using environmentally safe materials.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
  4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction



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TEMPORARY FACILITIES

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in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

**3.5 OPERATION, TERMINATION AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
  - 2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
  - 2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
    - a. Replace air filters and clean inside of ductwork and housings.
    - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
    - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION

## SECTION 01 58 13

### PROJECT SIGNS

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#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Furnish, install, and maintain project identification sign.
- B. Provide temporary on-site informational signs:
  - 1. As required by codes, laws, and regulatory agencies.
  - 2. To identify key elements of construction facilities.
  - 3. To direct traffic.
- C. Remove signs at completion of construction.
- D. Allow no other signs to be displayed.

##### 1.2 PROJECT IDENTIFICATION SIGN

- A. Erect on the site at a lighted location of high public visibility, adjacent to the main entrance to site, as approved by Architect. Sign to be two (2) 8' wide by 4' tall plywood sheets mounted on two 6 x 6 pressure treated posts in the shape of a "V". Sign shall have:
  - Job Title "New Fayette County Animal Shelter"
  - Fayette County Board of Commissioners and Chairman's names list along with their Districts
  - County Seal
  - Name and title of Animal Services Director
  - Architects name with logo at bottom left
  - Contractor's name with logo at bottom right.

#### PART 2 - PRODUCTS

##### 2.1 SIGN MATERIALS

- A. Structure and Framing: May be new, wood or metal, in sound condition structurally adequate to work, and suitable for specified finish.
- B. Sign Surfaces: Two, exterior marine grade 4' x 8' plywood sheets with vinyl or painted lettering mounted to three 6 x 6 pressure-treated posts (forming a "V").
- C. Rough Hardware: Galvanized
- D. Paint: Exterior quality, as specified in Section 09 91 00.
  - 1. Use bulletin colors for graphics.
  - 2. Colors for structure, framing, sign surfaces, and graphics as shown.

#### PART 3 - EXECUTION

## SECTION 01 58 13

### PROJECT SIGNS

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#### 3.1 PROJECT IDENTIFICATION SIGN

- A. Paint all exposed surfaces of supports, framing, and surface materials; one coat of primer, and one coat of exterior paint.
- B. Paint graphics in the styles, sizes and colors as indicated on drawing in this section of specifications.
- C. Provide the Project name at top center; Owner's name middle center; in smaller font provide Architect's name and address at lower left; Contractor's name and address at lower right; and any other name deemed appropriate for the project at lower center.

#### 3.2 MAINTENANCE

- A. Maintain signs and supports in a neat, clean condition; repair damages to structure, framing, or sign.
- B. Relocate informational signs as required by progress of work.

#### 3.3 REMOVAL

- A. Remove signs, framing, supports, and foundations at completion of project.

END OF SECTION

**SECTION 01 70 00  
PROJECT CLOSEOUT**

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
1. Inspection procedures
  2. Project record document submittal
  3. Operating and maintenance manual submittal
  4. Submittal of warranties
  5. Final clearing
- B. Closeout requirements for specific construction activities are included in the appropriate Sections contained in this manual.

**1.3 SUBSTANTIAL COMPLETION**

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.
  2. Advise Owner of pending insurance change-over requirements.
  3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
  4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
  5. Submit record drawings, maintenance manuals, and similar final record information.
  6. Deliver tools, spare parts, extra stock, and similar items.
  7. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
  8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with

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construction tools, mock-ups, and similar elements.

9. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- B. Inspect Procedures: On receipt of a request for inspection the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Architect will repeat inspection when requested and assured that the work has been substantially completed.
  2. Results of the completed inspection will form the basis of requirements for final acceptance.
  3. The initial inspection shall be scheduled at least 20 days prior to date of substantial completion.
  4. If necessary, the initial inspection will be repeated. Architects and Engineers cost for re-inspection will be paid by the Contractor and deducted from the contract sum by change order.

**1.4 FINAL ACCEPTANCE**

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
  2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
  3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
  4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the work.
  5. Submit consent of surety to final payment.
  6. Submit a final liquidated damages settlement statement.
  7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Re-inspection Procedure: The Architect will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon completion of re-inspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not

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been fulfilled but are required for final acceptance.

2. If necessary, re-inspection will be repeated, and the Architect's and Engineer's costs for re-inspection will be paid by the Contractor and deducted from the contract sum by change order.

**1.5 RECORD DOCUMENT SUBMITTALS**

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
  1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
  2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
  3. Note related Change Order numbers where applicable.
  4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
  1. Upon completion of the work, submit record Specifications to the Architect for the Owner's records.
- D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

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PROJECT CLOSEOUT

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1. Upon completion of mark-up, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information.
1. Emergency instructions
  2. Spare parts lists
  3. Copies of warranties
  4. Wiring diagrams
  5. Recommended "turn around" cycles
  6. Inspection procedures
  7. Shop Drawings and Product Data
  8. Fixture lamping schedule

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
1. Maintenance manuals
  2. Record documents
  3. Spare parts and materials
  4. Tools
  5. Lubricants



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PROJECT CLOSEOUT

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- 6. Fuels
  - 7. Identification systems
  - 8. Control sequences
  - 9. Hazards
  - 10. Cleaning
  - 11. Warranties and bonds
  - 12. Maintenance agreements and similar continuing commitments
- B. As part of instruction for operating equipment, demonstrate the following procedures:
- 1. Start-up
  - 2. Shutdown
  - 3. Emergency operations
  - 4. Noise and vibration adjustments
  - 5. Safety procedures
  - 6. Economy and efficiency adjustments
  - 7. Effective energy utilization
- 3.2 **FINAL CLEANING**
- A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- a. Remove labels that are not permanent labels
  - b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
  - c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
  - d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
  - e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
- C. Pest Control: Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.

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PROJECT CLOSEOUT

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- D. Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
1. Where extra materials of value remaining after completion of associated work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION

**SECTION 01 78 33**  
**WARRANTIES AND BONDS**

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
  2. General closeout requirements are included in Section "Project Closeout."
  3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of this manual.
  4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

**1.3 DEFINITIONS**

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

**1.4 WARRANTY REQUIREMENTS**

- A. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
- B. Reinstatement of Warranty: When work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor

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WARRANTIES AND BONDS

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is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.

- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

- E. The Owner reserves the right to refuse to accept work for the Project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.

**1.5 SUBMITTALS**

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the work, submit written warranties upon request of the Architect.

1. When a designated portion of the work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the work.

- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.

1. Refer to individual Sections of Divisions-2 through -16 for specific content requirements, and particular requirements for submittal of special warranties.

- C. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

- D. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the

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WARRANTIES AND BONDS

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- product or installation, including the name of the product, and the name, address, and telephone number of the installer.
2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project title or name, and the name of the Contractor.
  3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 78 39  
PROJECT RECORD DOCUMENTS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Related Sections include the following:
  - 1. Division 1 Section "Project Closeout" for general closeout procedures.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit **one** set of marked-up Record Prints and one electronic copy.
  - 2. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Initial Submittal: Submit **one** set of **corrected Record electronic files** and **one** set of marked-up Record Prints. Architect will initial and date each **marked-up set** and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return **transparencies** and prints for organizing into sets, printing, binding, and final submittal.
    - b. Final Submittal: Submit **one** set of marked-up Record Prints, **one** set of record transparencies, and **three** copies printed from Record Transparencies. Print each Drawing, whether or not changes and additional information were recorded.
    - c. Final Submittal: Submit **one** set of marked-up Record Prints, **one** set of Record CAD Drawing files, **one** set of Record CAD Drawing plots, and **three** copies printed from record plots. Plot and print each Drawing, whether or not changes and additional information were recorded.

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PROJECT RECORD DOCUMENTS

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1) Electronic Media: Flash Drive

- B. Record Specifications: Submit **one copy** of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit **one copy** of each Product Data submittal.
  - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
  - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an understandable drawing technique.
    - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  - 2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.



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- k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  - 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
- 1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
  - 2. Refer instances of uncertainty to Architect for resolution.
  - 3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
  - 4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.
- C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
- 1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
  - 2. Format: **DWG**, operating in **Windows NT** operating system.
  - 3. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
  - 4. Refer instances of uncertainty to Architect for resolution.
  - 5. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
    - a. Architect makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
    - b. CAD Software Program: The Contract Drawings are available in AUTOCAD 2000.

SECTION 01 78 39  
PROJECT RECORD DOCUMENTS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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- D. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
  2. Consult with Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- E. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect .
    - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

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4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
  5. Note related Change Orders, Record Drawings, **and Product Data** where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, Record Drawings, **and Product Data** where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

**END OF SECTION 017839**

SECTION 01 79 00  
DEMONSTRATION AND TRAINING

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Related Sections include the following:
  - 1. Division 1 Section "Allowances" for administrative and procedural requirements for demonstration and training allowances.
  - 2. Division 1 Section "Project Coordination" for requirements for pre-instruction conferences.
  - 3. Division 1 Section "Photographic Documentation" for preparing and submitting demonstration and training videotapes.
- C. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified in Division 1 Section "Allowances."
- D. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up.

1.3 SUBMITTALS

- A. Instruction Program: Submit **four** copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. At completion of training, submit **four** complete training manuals for Owner's use.
- B. Attendance Record: For each training module, submit list of participants and length of instruction time.
- C. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.
- D. Demonstration and Training Videotape: Submit **four** copies at end of each training module.

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1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  - 3. Review required content of instruction.
  - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM (as applicable)

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
  - 1. Motorized doors, including **overhead coiling doors**.
  - 2. Equipment, including **residential appliances**.
  - 3. Fire-protection systems, including **fire alarm, fire pumps, and fire-extinguishing systems**.
  - 4. Intrusion detection systems.
  - 5. Medical equipment, including medical gas equipment and piping.
  - 6. Heat generation, including **pumps and water distribution piping**.

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8. Refrigeration systems, including **chillers, cooling towers, condensers, pumps, and distribution piping.**
  9. HVAC systems, including **air-handling equipment, air distribution systems, and terminal equipment and devices.**
  10. HVAC instrumentation and controls.
  11. Electrical service and distribution, including **transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.**
  12. Packaged engine generators, including transfer switches.
  13. Lighting equipment and controls.
  14. Communication systems, including **intercommunication, surveillance, clocks and programming, voice and data, and television** equipment.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project Record Documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.
  4. Operations: Include the following, as applicable:
    - a. Startup procedures.

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- b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
- a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
- a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
- a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

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- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
  - B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
  - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner, **through Architect**, with at least **seven** days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of **a written** performance-based test.
- E. Demonstration and Training Videotape: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
  - 1. Comply with requirements in Division 1 Section "Photographic Documentation."
  - 2. At beginning of each training module, record each chart containing learning objective and lesson outline.
- F. Cleanup: Collect used and leftover educational materials and **give to Owner**. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

**END OF SECTION**



## SECTION 03 30 00

### CONCRETE WORK

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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#### PART 1 - GENERAL

##### 1.01 SCOPE

- A. This section shall include all labor, materials, accessories, equipment, and related services for the construction of concrete forms; detailing, fabrication, transportation, storage, handling, and placement of reinforcing; and mix design, testing, and placement of concrete as shown on the drawings and/or specified herein.

##### 1.02 REFERENCE STANDARDS

- A. The following publications, but referred to in this section by their basic designation, form a part of this section to the extent specified herein or called for on the drawings:
1. American Concrete Institute (ACI), publications:
    - a. Standard Tolerances for Concrete Construction and Materials.
    - b. Specification for Structural Concrete for Buildings.
    - c. Recommended Practice for Measuring, Mixing, and Placing Concrete.
    - d. Hot weather Concreting.
    - e. Cold Weather Concreting.
    - f. Standard Practice for Consolidation of Concrete.
    - g. Building Code Requirements for Reinforced Concrete.
    - h. Recommended Practice for Concrete Formwork.
    - i. Recommended Practice for Shotcreting.
    - j. Detailing Manual
  2. Concrete Reinforcing Steel Institute (CRSI), publications:
    - a. CRSI-Manual of Standard Practice
    - b. CRSI-Placing Reinforcing Bars
  3. American Society for Testing and Materials (ASTM) publications:
    - a. Standard Specification for Welded Steel Wire Fabric for Concrete Reinforcement.
    - b. Standard Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement with Supplementary Requirements S1.
    - c. Standard Specification for Rail Steel Deformed and Plain Bars for Concrete Reinforcement.
    - d. Standard Specification for Axle Steel Deformed and Plain Bars for Concrete Reinforcement.

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- e. Standard Method of Making and Curing Concrete Test Specimens in the Field.
  - f. Standard Specification for Concrete Aggregates.
  - g. Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens.
  - h. Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  - i. Standard Specification for Ready-Mixed Concrete.
  - j. Standard Specification for Aggregate for Masonry Mortar.
  - k. Standard Specification for Portland Cement.
  - l. Standard Method of Sampling Fresh Concrete.
  - m. Standard Method of Making and Curing Concrete Test Specimens in the Laboratory.
  - n. Standard Specification for Air-Entraining Admixtures for Concrete.
  - o. Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - p. Standard Specification for Chemical Admixtures for Concrete.
  - q. Standard Specifications for Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resistant Bituminous Types)
  - 3. American Welding Society (AWS) publication
    - a. AWS D1.4-79 Structural Welding Code-Reinforcing Steel.
  - 4. Standard Building Code
  - 5. American Institute of Steel Construction (AISC) publications:
    - a. Manual of Steel Construction
  - 6. American Institute of Timber Construction (AITC) publications:
    - a. Timber Construction Manual

1.03 SUBMITTALS

A. The Contractor shall submit to the Architect five (5) copies of the following information for review:

- 1. Curing compound manufacturer's data sheets.

B. Two copies will be returned to the Contractor marked as follows:

- 1. "No Exceptions Taken" - Indicates the information has been reviewed for conformance with contract documents and no exceptions have been taken. Proceed with the work.

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### CONCRETE WORK

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2. "Exceptions Noted" - Indicates that the drawings have been reviewed for conformance with the contract documents and that exceptions have been taken. Contractor may proceed with the work provided he corrects work as noted. Resubmittal will not be required.
  3. "Exceptions Noted - Resubmit" - Indicates that the drawings have been reviewed for conformance with the contract documents and that work may proceed on items to which no exceptions have been taken. After items to which exceptions have been taken are corrected, Contractor shall again submit copies for review.
  4. "Resubmit" - Indicates that the drawings have been reviewed for conformance with the contract documents and are too incomplete or in an unacceptable condition for review. A notation will be made on the shop drawings as to the exceptions taken. Drawings shall be revised and resubmitted for review before proceeding with the work.

#### 1.04 DESIGN OF FORMWORK

##### A. Responsibility

1. The design and engineering of the formwork as well as its construction shall be the responsibility of the Contractor.
2. Where concrete is cast against earth cut or an existing structure, such cut or structure shall be considered a form for which the Contractor shall be responsible.

##### B. Criteria

1. Except as specifically called for otherwise herein, all formwork shall meet the requirements of ACI 347, Chapter 4 and 6 of ACI 301 and Chapter 6 of ACI 318.
2. Specifically the formwork shall be designed as a minimum for the loads and lateral pressure outlined in paragraph 1.2 of ACI 347 and wind loads specified by the Standard Building Code. Design considerations and allowable stresses shall meet the above references and the applicable requirements of the AISC Manual of Steel Construction and the AITC Timber Construction Manual.

#### 1.05 MIX DESIGN

- A. Prior to concrete placement of any concrete, the concrete mix design the Contractor proposes to use for each type of concrete shall be submitted to the Architect for review.
- B. The Concrete mix shall be proportioned to give a 28-day strength of the properties outlined in the drawings (e.g. 3,000/5000 psi) and other properties as specified herein as determined by laboratory tests in accordance with requirements specified herein.
- C. The laboratory or laboratories which design and test the concrete mix shall be obtained by the

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Contractor, approved by the Architect and paid for by the Contractor.

#### 1.06 TESTING OF CONCRETE

- A. A laboratory shall be obtained by the Contractor approved by the Architect and paid for by the Contractor for the purpose of sampling and testing of concrete.
- B. The following samples shall be taken at the job site. If any material has been added to the concrete, tests shall be made after material has been added to the concrete.
  - 1. For each 100 cubic yards, or fraction thereof, of concrete three test specimens shall be made and cured in accordance with ASTM C172 and C31. Each set of three cylinders shall have a numerical designation and each cylinder an alphabetical subdesignation. Thus, the first set of three cylinders shall be numbered 1A, 1B, and 1C. One cylinder shall be broken at 7 days and two at 28 days. The average of the two 28-day cylinder breaks shall be considered one test. Cylinders shall be broken in accordance with ASTM C39.
  - 2. For each 100 cubic yards, or fraction thereof, of concrete a slump test shall be made in accordance with ASTM C143 and the density and air content shall be determined in accordance with ASTM C172 and C31.

#### 1.07 SHOP DRAWINGS

- A. The Contractor shall furnish drawings, schedules, and details for the fabrication of the reinforcing steel AND the phasing of excavation and new concrete placement. The drawings and details shall be so complete that when used with the contract drawings the reinforcing steel can be properly placed. In addition, shop drawings showing all footing details, CMU details and slab details. All shop related shop drawings to be submitted with a professional engineer's stamp in this discipline.
- B. In case the Contractor is in doubt regarding certain dimensions shown on the contract drawings, or if there is a discrepancy on the contract plans, the Contractor or his agent shall circle and question such dimensions on his shop drawings. In such cases the dimensions shall be especially checked or supplied by the Architect.
- C. All drawings for review must be submitted in five copies. Two sets shall be returned to the Contractor marked as follows:
  - 1. "No Exceptions Taken" - Indicates the material has been reviewed for conformance with contract documents and no exceptions have been taken. Proceed with the work.
  - 2. "Exceptions Noted" - Indicates that the material has been reviewed for conformance with the contract documents and that exceptions have been taken. Contractor may proceed with the work provided he corrects the work as noted. Resubmittal will not be required.

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### CONCRETE WORK

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- 3. "Exceptions Noted - Resubmit" - Indicates that the material has been reviewed for conformance with the contract documents and that work may proceed on items to which no exceptions have been taken. After items to which exceptions have been taken are corrected, Contractor shall again submit copies for review.
  - 4. "Resubmit" - Indicates that the material has been reviewed for conformance with the contract documents and is too incomplete or in an unacceptable condition for review. A notation will be made as to the exceptions taken. Material shall be revised and resubmitted for review before proceeding with the work.
- E. In case exceptions are noted on one sheet which affect details on other sheets, the exception is to be taken as applying to such other details.
  - F. Review of shop drawings by the Architect or Engineer shall not constitute an authorization or approval of a change to the contract. Changes from the contract documents must be made by written change order and issued by the Architect.
  - G. Work must not proceed on items to which exceptions have been taken.
  - H. The Contractor must check and be responsible for the conforming of all steel reinforcing details shown on shop drawings to those shown on the Contract drawings.
  - I. All bars shall be shown on shop drawings as to number, size, length, and spacing in a manner similar or complementary to the way they are shown on contract drawings.

#### 1.08 QUALITY CONTROL

- A. Should misalignment of forms or screeds or deflection of forms or displacement of reinforcement occur during concrete placing, corrective measures shall be immediately made to the extent that placing operations shall be stopped and concrete removed from within forms. The corrective measures shall be such as to ensure acceptable lines and surfaces to the prescribed dimensions and cross sections.
- B. Any work not meeting the requirements of this section shall be deemed in non-compliance and shall be removed or corrected at no additional expense to the Owner.
- C. The Contractor shall prepare for the Architect's review his proposed method of removal or correcting any work which is in non-compliance prior to commencing with the work.
- D. Any work which is in non-compliance and is allowed to remain in place by the Architect shall be made a part of this contract by issuing a change order as set forth in the General Conditions of this specification.
- E. Should displacement of reinforcing steel occur during concrete placement, corrective measures shall be immediately made to the extent that placing operations shall be stopped and concrete removed from within the forms.
- F. To comply with this specification, concrete shall obtain its design strength at the 28-day break. Any

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concrete not obtaining its design strength as determined by the 28-day break shall be considered as not complying to this specification.

- G. The results of the concrete tests shall be evaluated in accordance with paragraphs 17.2 of ACI Standard 301.
- H. If compressive tests fail to meet the specified strength, the following procedures shall be followed: The Architect shall determine if the concrete has been placed in a position of critical structural importance. If the concrete has been placed in a position of critical structural importance, the Contractor shall have core tests made by a testing laboratory approved by the Architect. Core tests shall be done in accordance with ASTM C42 and paragraph 17.3.2 of ACI Standard 301. These core tests shall be taken in each area in question. Such tests shall be paid for by the Contractor. If core tests fail to verify the design strength requirements, the Contractor will have two options:
  - 1. Remove and reconstruct that portion of the structure found to be defective. Removal and replacement will not be undertaken until a plan and procedure has been proposed by the Contractor and approved by the Architect. All such work shall be done at the Contractor's expense.
  - 2. Have a testing laboratory approved by the Architect conduct a load test on the questionable portion of the structure in accordance with Chapter 20 of ACI Building Code 318. If the test demonstrates that the member or members are not acceptable under the provisions of Chapter 20, Option One becomes mandatory. All costs of the load test shall be paid for by the Contractor.
- I. If tests, either by the 28-day break or core tests, have demonstrated that concrete supplied has not met the strength requirements of the specifications, but the concrete has been permitted to remain in place in the structure by the Architect, a change order shall be issued as set forth in the General Conditions Section of these specifications.

## PART 2 - PRODUCT

### 2.01 FORMS

- A. Forms for unexposed work or surfaces covered by a non-contact finish.
  - 1. Where work is to be covered by a non-contact finish or not exposed to view, forms of metal, metal and wood, wood, or a pre-engineer forming system will be accepted.
- B. Forms for exposed work or surfaces covered by a contact finish.
  - 1. Where work is to be left exposed, or concrete surface is covered by a contact finish, forms shall either be plywood, lined plank, or patented type panels. All plywood shall receive non-staining protective coating that affords positive release.

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2. Forms shall not be reused when the surface material delaminates, splits, or becomes marred.

#### 2.02 APPURTENANCES

##### A. Form Ties

1. Except for exposed work or Architecturally exposed concrete, snap ties may be used for wall forms. Pull ties, which are to be completely removed, or cone type break back ties that will leave clean cut holes without fractures, spalls, shallows, depressions, or other disfigurations shall be used for all exposed work, and Architecturally exposed concrete.

##### B. Expansion Joint Material

1. Expansion joint material shall meet ASTM C1751.

#### 2.03 REINFORCING

- A. Reinforcing steel shall meet ASTM A-615, ASTM 616, or ASTM 617, and develop 60,000 psi at yield.

- B. Wire mesh shall meet ASTM A-185.

#### 2.04 ACCESSORIES

- A. Bar supports shall meet the requirements of CRSI, Manual of Standard Practice, unless specified otherwise herein.

- B. Legs of all accessories used over exposed concrete surfaces shall have that portion of the accessories in contact with the form coated with plastic, or the accessory shall be of stainless steel.

#### 2.05 CEMENT

- A. All cement used on this construction for exposed concrete shall be one brand of Portland cement. All cement shall be Type 1 and meet the requirements of ASTM 150.

#### 2.06 AGGREGATES

- A. Samples of both coarse and fine aggregates shall be selected by the Contractor at the beginning of the work, and following approval of laboratory tests, shall be used throughout the work as standards to which the aggregate must conform.

1. Fine aggregates shall conform to ASTM C33.

2. Coarse aggregates for regular weight concrete shall conform to ASTM C33 and shall be sized within the limits as established by Table 2, 1" to #4.

#### 2.07 WATER

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CONCRETE WORK

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- A. Water shall be clean, free from oil, acid, vegetable matter, alkalies or salts.

2.08 ADMIXES

- A. Admixes shall conform to ASTM C-494 and not contain any chloride ions.

2.09 AIR ENTRAINMENT

- A. Air entraining agent shall conform to ASTM C260.

2.10 ABRASIVE AGGREGATES

- A. Abrasive aggregates shall be aluminum oxide or carborundum and have a hardness factor of 9 mohs.

2.11 CURING COMPOUND

- A. Curing compound for unformed surfaces without a surface applied cementitious bonding agent or fill.

1. Curing compound shall be formulated by the manufacturer not to interfere with the bond of or adhesion of resilient floor coverings, paints, sprayed on or applied finishes, water-proofing materials, other types of finish, or curing compounds.
2. Curing compound shall be a combination sealer-hardener and dust-proofer.
3. Curing compound shall be a membrane forming resin containing 18% minimum solids with a fugitive dye meeting the requirements of ASTM C309, Type 1-D, Class A.
4. The following products are approved:

Spartan Cote	-	The Burke Company
Rez. Seal	-	Euclid
SealCo	-	Gifford Hill
Clearbond	-	Guardian
Dress & Seal #18	-	L&M Construction Chemicals
Clear Seal 150	-	AC Horne
MB429	-	Master Builders
Kure-N-Seal, 0800	-	Sonneborn
C5309	-	WR Meadows

- B. Curing compounds for formed concrete surfaces exposed to view.

1. Curing compound shall be formulated not to interfere with the bond or adhesion of any applied coating or covering.
2. Curing compound shall be a penetrating compound with a fugitive dye meeting the requirements of ASTM C309, Type 1D.



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3. The following products are approved.

Cure Concentrate	-	The Burke Co
Eucosil	-	Euclid
L&M Cure	-	L&M Construction Chemicals
Horne One Kote	-	AC Horne
Master Seal	-	Master Builders

2.12 PROPORTIONS

- A. All concrete shall provide the ultimate compressive strength at 28 days, as determined by laboratory cured cylinders, as shown on the drawings. All mix designs shall be proportioned in accordance with one of the following methods.

1. ACI 318, Section 4.3, Proportioning on the basis of field experience and/or trial mixtures.
2. ACI 318, Section 4.4, Proportioning by water cement ratio.

- B. The mix shall be so proportioned so that the average of any three consecutive strength tests shall be equal to or greater than the strength specified on plans, and no test shall have a value less than the specified strength less 3000 psi.

- C. Minimum cement content for regular concrete shall be as follows:

1. REGULAR WEIGHT CONCRETE:

3,000 psi concrete 498# (5.3 bags)

5,000 psi concrete 705# (7.5 bags)

For pump mixes add 47# (0.5 bags) to the above quantities.

- D. The water-cement ration of the mix shall be established in the design and shall be based on the established relationship between the water-cement ration and the strength of concrete shall be such as to produce the specified strength of the concrete with the least amount of water consistent with the workability of the mix. Surface water contained in the aggregate shall be included as part of the mixing water in computing the water content. The design shall provide for a slump range of 3" minimum, 5" maximum.

- E. To each sack of cement the following amount of admix shall be provided:

1. Air temperature above 80 degrees F

3 oz. - Master Builders - Pozzolith 300R

3 oz. - Protex PDA 25XL

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2 oz.	-	Sika Chemical Co. - Plastement
2 oz.	-	Gifford Hill PSI - Normal
2 oz.	-	Castle Chemical Corp. - Chemstrong R
2 oz.	-	Construction Chemical Co - Trisene N
5 oz.	-	Grace - WRDA-79

2. Air Temperature between 50 and 80 degrees F.

3 oz.	-	Master Builders Pozzoloth 300N
3 oz.	-	Protex PBA 25R
3 oz.	-	Sika Chemical Co. - Plastement NS
3 oz.	-	Gifford Hill PSI - Retarder
3 oz.	-	Castle Chemical Corporation - Chemstrong A
3 oz.	-	Construction Chemical Co - Trisene R
7.5 oz.	-	Grace - WRDA

3. Air temperature below 50 degrees F.

8 oz.	-	Master Builders - Pozzutec 20
8 oz.	-	Sika Chemical Co. - Plastorcrete 161 PC
12 oz.	-	Grace - Darex

#### 2.13 FABRICATION

- A. All reinforcing shall be fabricated. Fabrication shall be in accordance with applicable sections, ACI 301, ACI 318, ACI-SP66, and CRSI Manual of Standard Practice. All bends shall be made cold around pins having a diameter of not less than that specified in the bend test of the applicable ASTM specifications. Heating bars for bending is prohibited without the written approval of the Architect.
- B. Reinforcement shall be correct in length and size and bent as prescribed by contract drawings or specifications.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Excavations

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1. Where excavations exceeding a depth of five feet are to be made to install the foundations or any part of the structure of this building or any retaining walls on the site, the back slope of such excavation shall be at an incline not exceeding one vertical to two horizontal unless such backslope is sheeted and braced. If sheeting and bracing are to be provided, such sheeting and bracing shall be designed by an Engineer registered in the state where the project is located. Such sheeting and bracing shall be designed to resist the pressures given on pages 14-32 of the CRSI Design Handbook unless more specific pressures are determined by a Registered Soils Engineer. The cost of such design work and installation shall be paid for by the Contractor at no additional cost to the Owner.
  2. No excavation shall be made below a line extending downward and away from any foundation grade slab or other building element on a slope one vertical or two horizontal, unless such foundation, grade slab, or other building element is under pinned. The underpinning shall be designed by an Engineer registered in the state where the project is located. The cost of such design work and installation shall be paid for by the Contractor at no additional cost to the Owner.
- B. Treat excavated soil for termites as required by industry standards.
- C. Care of Materials
1. Shipping, storage and handling of reinforcing steel shall be in such a manner as to prevent damage.
  2. Straightening of bars bent in shipping or handling will not be undertaken except when so directed by change order.
- D. Cleaning
1. Reinforcing shall be cleaned of grease, dirt, concrete, or other foreign substances.

#### 3.02 INSTALLATION

- A. Construction of Forms
1. All forms shall be built and secured in place to carry the dead weight of the concrete as a liquid without deflection or distortion exceeding the requirements of ACI 347. Formwork shall be built watertight, true to position and direction. Formwork shall be constructed so as to ensure the concrete surfaces will conform to the tolerances given in ACI 347.
  2. All concrete surfaces that are to be left exposed on interior and exterior of the building shall have the forms so constructed that when removed they will produce a uniform smooth surface free from misalignment and imperfections.
  3. Where new concrete is placed above a previous placement, the joint between new and old

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work, as well as the face of the concrete surface, must be aligned.

4. All wood forms shall be built of sound lumber. Clean and remove nails from form material before reusing or when using second-hand lumber.
5. Unless indicated otherwise on the drawings, all columns shall be centered on the foundations supporting them within a tolerance of 2".
6. Where earth is too unstable to serve as a form for foundations or walls, wood forms shall be provided.
7. Box out all slots, recesses, or openings for work of all trades.
8. Build bulkheads with keys in walls and footings at construction joints in concrete.
9. Bevel strips shall be placed at all outside corners of exposed work unless shown otherwise on architectural details.
10. All overhanging edges shall be provided with a 1/2" quarter round drip 2" from the edge.

B. Installing other material in forms

1. Expansion joint fillers shall be installed in the forms, where called for on plans, in advance of the pour. 8d nails of 2'-0" o.c. shall be placed through the filler so that when concrete is placed, the nails will be embedded so as to lock the filler in place.
2. Compact earth fill under slabs on grade in eight inch layers with mechanical equipment to obtain a compaction of 95% standard proctor, unless specified otherwise.
3. Provide 6 mil polyethylene film vapor barrier under all slabs on grade.
4. Fill for slabs on grade shall be #57 stone, 4" thick, where shown on drawings.

C. Placement of Reinforcement

1. Reinforcement shall be placed to conform with the recommendations of ACI 301, ACI 318, and CRSI Manual of Standard Practice.
2. Bars shall not be cut or bent in the field unless specifically called for on detail drawings.
3. Bars with kinks or bends not shown on detail drawings shall not be used.
4. Contract drawings shall take precedence over Contractor's working drawings unless otherwise authorized by written change order.
5. Contract drawings shall be referred to by the steel setter for details governing placing.
6. Vertical steel shall be lapped 30 diameters at splices unless specifically called for otherwise on plans.
7. Steel dowels for successive work shall be wired in the prescribed position before placing concrete. The "sticking" of dowels after placing concrete will not be permitted.
8. Hooks may be turned flat to facilitate placement.

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- 9. Concrete covering for reinforcing steel shall be as follows unless shown otherwise on drawings:
    - a. Concrete cast against and permanently exposed to earth: 3"
    - b. Concrete exposed to earth or weather:
      - #6 through #18 bars: 2"
      - #5 bar, W31 or D31 wire, and smaller: 1-1/2"
    - c. Concrete not exposed to weather or in contact with ground:
      - Slabs, walls
      - #14 and #18 bar: 1-1/2"
      - #11 bar and smaller: 3/4"
  - 10. No splicing of main reinforcing steel will be permitted unless shown otherwise on plans. Bars marked continuous shall be lapped 30 diameters at splices, and at corner conditions corner bars shall be provided.
  - 11. No reinforcing shall be cut in the field unless it is called for to be cut on the reviewed shop drawings.
  - 12. No reinforcing shall be bent in the field unless it is called for to be bent on the reviewed shop drawings.
  - D. Placement of Wire Mesh
    - 1. Welded wire fabric shall be lapped 6" at both side and end laps unless shown otherwise on drawings and wire together at 18" o.c. Mesh shall extend to within 2" of sides and end of slabs.

#### 3.03 WELDING OF REINFORCEMENT

- A. All reinforcing bars which are to be welded shall be welded in accordance with AWS D1.4.

#### 3.04 MIXING

- A. All materials shall be measured and mixed in a machine. Mixing and transporting shall meet ASTM C94. The materials shall first be mixed dry and the water then added by measurement.
- B. Mixing time shall begin when the water is added to the mix.
- C. Water shall not be added to the mix at the job site except under the direction of the laboratory responsible for testing (paragraph 1.06). The laboratory shall instruct that a fixed amount of cement shall be added to maintain the water-cement ratio. The mixer shall be turned 50 revolutions after the addition of water.
- D. A slump test shall be made of any concrete to which water has been added to ascertain that the slump does not exceed 5" for regular mixes and 6" for pump mixes.
- E. A record shall be kept of any concrete to which water has been added, and the record shall show the

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results of the slump test.

#### 3.05 PREPARATION

- A. Before the placing of any concrete the footing trenches shall be drained of water, any mud film removed and any loose dirt lifted out.
- B. Before placing concrete in forms the forms shall be cleaned and all debris removed. All reinforcing shall be checked to be sure that no reinforcing is touching the form or pan sides. A man shall be designated during the pour to keep the steel in the prescribed position.
- C. Before placing any concrete it shall be determined that all conduits, pipes, sleeves, inserts, hangers, steel equipment, grounds, anchors, and other work that is to be built into the concrete is located and installed. All such items shall be so placed as not to interfere with the reinforcing steel.
- D. No concrete shall be placed until the Architect has observed the reinforcement.
- E. Wood board forms shall be soaked with water first before the concrete is placed.
- F. Metal forms shall be oiled before reinforcement is placed.
- G. All reinforcement shall be supported and fastened in prescribed position and protected against displacement during pouring operations.
- H. A workman shall be designated to lift mesh reinforcing off the ground or the bottom of forms as concrete is placed.
- I. Concrete temperature at time of placement shall be as follows:

Temperature F Degrees	Concrete Temperature Maximum	F Degrees Minimum
Above 75	90	75
50 - 75	90	75
40 - 50	90	65
30 - 40	90	55
0 - 30	90	65
Below 0	90	70

#### J. Cold Weather Concreting

- 1. Cold weather concreting procedures shall be used when temperature at job site is 40 degrees or below at time of concrete placement as follows:
  - a. Heat ingredients as necessary to produce a mix temperature at time of placement

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as specified herein.

- b. Concrete shall be heated, insulated, and protected as necessary to maintain a concrete temperature of 40 degrees F minimum for 72 hours after placement.
  - c. Accelerating agents shall not be used unless approval from the Architect has been obtained.
2. ACI 306R should be used as a guide in determining proper procedures for cold weather concreting.

#### K. Hot Weather Concreting

1. Hot weather concreting procedures shall be used when temperature a job site is 75 degrees F or above at time of concrete placement or wind or humidity is such to result in shrinkage cracking as follows:
- a. Cool materials necessary to produce a mix temperature at time of placement as specified herein.
  - b. Mix time shall not exceed one hour from time of initial mix.
  - c. Concrete once discharged from truck shall be placed in its final position within 30 minutes from time of discharge.
  - d. Placed concrete shall be cooled or protected as necessary to maintain a concrete temperature of 120 degrees maximum for 48 hours after placement.
  - e. Retarding agents shall not be used unless approval from the Architect has been obtained.

2.ACI 305R should be used as a guide in determining proper procedures for cold weather concreting.

#### 3.06 TRANSPORTING CONCRETE

- A. Concrete shall be handled from the mixer to the place of final deposit by means of carts, buggies, conveyor, or pump in accordance with ACI 304. If the concrete is to be transported more than fifty feet in carts or buggies they shall be equipped with pneumatic tires. Concrete delivered to the carts, buggies, or conveyors from spouts, troughs or mixer trucks shall not have a free fall of more than three (3) feet. Prevent separation or loss of ingredients while transporting the concrete.

#### 3.07 CASTING

- A. It shall be the responsibility of the Contractor to consider the temperature and humidity in scheduling the time interval between mixing and placing. No partially hardened concrete shall be placed. Placement

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shall meet the requirements of ACI 304.

- B. Special care shall be observed to avoid concrete spilling over forms when placing.
- C. Placing of concrete shall be rapid and continuous between construction joints. Concrete shall not be placed when the sun, wind, heat, or humidity prevent placement and consolidation.
- D. Special care shall be taken in spading concrete around gangs of parallel conduit.
- E. Concrete shall not be placed within twenty-five feet of workmen placing or securing reinforcement.
- F. Internal type mechanical vibrators and hand spading shall be used to consolidate the concrete and produce a dense concrete free from voids and honeycombs. Care shall be taken that vibration is not applied long enough to separate the ingredients. Use and type of vibrators shall conform to ACI 309.
- G. Hand spreading shall be done with shovels not rakes.
- H. Before depositing the new concrete on or against concrete that has hardened, the forms shall be retightened, the surface of the hardened concrete roughened, cleaned of foreign matter than laitance and moistened with water. To ensure mortar at the juncture of the hardened and newly deposited concrete, the cleaned and moistened surface of the hardened concrete, including vertical and inclined surfaces, shall first be slushed with a coating of neat cement grout against which the new concrete shall be placed before the grout has attained its initial set. Before starting to place concrete in walls and columns a uniform layer of grout two inches thick shall be placed at the bottom of the forms or on top of the hardened concrete. The grout shall consist of one part cement and two parts sand with enough water to make a thick consistency.
- I. All horizontal surfaces shall be screeded to an even surface by the use of a straight edge and screeding strips set at the level called for on plans. Screeds shall be of such type and so arranged as not to interfere with the top slab steel. Finish is specified in a following section.

#### 3.08 PROTECTION

- A. Workmen shall not walk on concrete during placing or finishing with any earth or foreign matter on footgear.
- B. All freshly placed concrete shall be protected from damage or injury due to water, falling objects, persons or anything that might mar, discolor, or injure the finish surface of the concrete. Any surfaces that are damaged due to lack of protective measures shall be removed and replaced with fresh concrete at the expense of the Contractor.

#### 3.09 FLOOR FINISHING

- A. Floors, except those requiring a special finish, shall be finished as follows:
  - 1. The surface of all concrete slabs, after screeding, shall be worked with a float in a manner



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which will compact the concrete and produce a surface free of depressions or inequalities of any kind. Test for grade (or level) and correct by removing excess or adding and compacting additional concrete.

2. All floor slabs, except in areas dropped to receive finish, shall receive a steel trowel finish as follows:
  - a. After screeding and floating slab surface and when concrete has hardened to prevent excess fines from working to the surface and surface water has disappeared, steel trowel slab to a smooth surface free from defects.
  - b. After initial troweling and when surface produces a ringing sound as trowel is moved across surface, steel trowel the slab a second time. The drying of the surface moisture must proceed naturally and must not be hastened by sacking or dusting on of sand or cement.
3. Areas which are dropped to receive a finish, after floating, shall be roughened with a very coarse broom.
4. All concrete ramps, docks, and stair treads shall be dusted with abrasive aggregates at the rate of 25 pounds per 100 square feet. Abrasive aggregates shall be worked into concrete surface by trowelling.

#### 3.10 CURING OF CONCRETE

##### A. Unformed Horizontal Surfaces

1. As soon as sheen of surface water has disappeared and the surface can be walked upon without damage (one or two hours) concrete surfaces shall be cured as follows:
  - a. All interior slabs with resilient tile, carpet or left exposed shall be cured with the specified curing and sealing compound.
  - b. All other interior slabs shall be cured with the specified dissipating resin type curing compound.
  - c. All vertical surfaces shall be cured with the specified curing and hardening compound when forms are removed prior to completion of the curing period.
  - d. The curing compounds must be applied immediately after final finishing.
  - e. Where required, the curing and hardening compounds shall be applied to vertical surfaces immediately after forms have been removed.
  - f. Sisalkraft paper, placed in a manner approved by the Engineer, may be used for any surface indicated above to be cured with the dissipating resin compound or the curing and hardening compound.

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2. Surface traffic shall not be permitted on curing compound until curing compound is completely dry.

#### B. Formed Surfaces

1. Formed surfaces which are rubbed after forms are removed shall be covered with the curing and hardening compound at manufacturer's specified rate immediately after rubbing is completed.
2. Formed surfaces which are repaired or patched shall be covered with the curing and hardening compound at manufacturer's specified rate immediately after repairing and/or patching is complete.
3. No coating, sealer or other applied material shall be placed on concrete which received a curing compound until forty-five (45) days after curing compound has been in place.

#### 3.11 TOLERANCES

- A. Tolerances for concrete floor slabs shall meet the requirements of ACI 117, Class BX Slabs.
- B. Where slabs abut at joints the differential elevation between abutting slabs shall be less than 1/16 inch.

#### 3.12 EXPOSED CONCRETE SURFACES

- A. Exposed concrete surfaces shall be finished as follows:
  1. Surfaces shall be rubbed smooth with carborundum brick or other abrasive within 36 hours after forms are removed. Surfaces shall be wetted and rubbed until a uniform color and texture is produced. No cement grout or slush shall be used other than the cement paste drawn from the green concrete itself by the rubbing process.
  2. The first panel that is to be finished shall be done in the presence of the Architect. When it is approved by the Architect, it shall serve as a standard to which all additional architecturally finished concrete shall conform.
  3. Edges of exposed beams and columns shall be pointed up to present a straight, square appearance.

#### 3.13 REMOVAL OF FORMS

- A. Removal
  1. Care shall be taken in the removal of the forms not to damage the surface of the concrete.

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Patching, Immediately after the forms are removed, the Architect shall examine the concrete and determine the extent and magnitude of any damaged or imperfect work. The Architect shall determine what work shall be patched and what work shall be removed and rebuilt. where allowed, shall be done immediately. Patching shall be done as specified in these specifications.

2. The removal of shoring and stripping of forms shall be the responsibility of the Contractor. In no case shall forms for columns or walls be removed in less than two days.
3. All form ties shall be broken back at least 1/2" from the surface of concrete, and pull ties shall be removed.

#### 3.14 PATCHING AND CORRECTION OF DEFECTIVE WORK

- A. Any concrete which is not within the allowable tolerances as set forth in ACI 347, Section 203.1 shall be considered as not conforming to these specifications. Any concrete which is not formed as shown on the plans or is out of alignment or level or shows a defective surface shall be considered as not conforming to these specifications.
- B. Any concrete as described above shall be removed from the job by the Contractor at his expense unless the Architect grants permission to patch or repair the defective area. Permission to patch or repair any such area shall not be considered a waiver of the Architect's right to require complete removal of the defective work if the patching does not, in his opinion, obtain the quality and appearance of the work as specified.
- C. Within 24 hours after removing form, all concrete surfaces shall be inspected by the Architect. With the Architect's approval any honeycombs, voids, stone pockets and tie holes shall at once be patched before the concrete is dry. Defective areas shall be chipped away to a depth of not less than one inch (1") with the edges perpendicular to the surface. The area to be patched and a space at least six inches (6") wide entirely surrounding it shall be dampened with water to prevent absorption of water from the patching mortar. The specified bonding compound shall be applied to the damp concrete.
- D. The patching shall be made of the same material and of the same proportions as used for the concrete except that the coarse aggregate shall be omitted. The amount of water used in mixing the mortar shall be consistent with the requirements of handling and placing. The mortar shall be retempered without the addition of water by allowing to stand for a period of one hour during which hour it shall be mixed with a trowel to prevent setting.
- E. After the bonding compound has dried, the mortar shall be compacted into place. Every hole and void shall be filled solid and the mortar screeded off to leave the patch slightly higher than the surrounding surface. It shall then be left undisturbed for a period of one to two hours to permit initial shrinkage before being finally finished. The patch shall be finished in such a manner to match the adjoining

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surface.

- F. Where patching is not accomplished within 24 hours after removal of forms, the shotcrete method of applying concrete under pressure shall be used. Application of shotcrete shall meet ACI 506.
- G. Where concrete or concrete work does not conform to the plans or to the specifications and is condemned by the Architect, procedures and plans covering removal and rebuilding or other corrective measures shall be submitted by the Contractor to the Architect before removal and rebuilding is begun. The cost of such plans, as well as the cost of corrective work or removal and rebuilding shall be at the Contractor's expense.

END OF SECTION

SECTION 04 26 13  
MASONRY VENEER

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SECTION 042613 - MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Stone Veneer.
- B. Products Installed but Not Furnished under This Section:
  - 1. Steel lintels in masonry veneer.
  - 2. Steel shelf angles for supporting masonry veneer.

1.2 ALLOWANCES

- A. Stone Veneer shall be included in Base Bid.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type and color of **stone and colored mortar**.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of product.

1.5 QUALITY ASSURANCE

- A. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
  - 1. Build sample panels for **each type of exposed unit masonry construction** in sizes approximately **48 inches (1200 mm)** long by **48 inches (1200 mm)** high by **full thickness**.

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1.6 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.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- 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. Stone Veneer to be Echelon Masonry Waterford Stone (Artisan Masonry Stone Veneers) with sheet membrane waterproofing on the concrete block behind the veneer..
  - 1. Colors: **As selected by Architect from manufacturer's full range.**

2.2 MORTAR MATERIALS

- A. Use mortar as recommended by manufacturer.

2.3 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches (38 mm) into veneer but with at least a 5/8-inch (16-mm) 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 A82/A82M, with ASTM A153/A153M, Class B-2 coating.
  - 2. Steel Sheet, Galvanized after Fabrication: ASTM A1008/A1008M, Commercial Steel, with ASTM A153/A153M, Class B coating.

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2.4 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch (0.40 mm) thick.
  2. Copper: ASTM B370, Temper H00, cold-rolled copper sheet, 16-oz./sq. ft. (4.9-kg/sq. m) weight or 0.0216 inch (0.55 mm) thick or ASTM B370, Temper H01, high-yield copper sheet, 12-oz./sq. ft. (3.7-kg/sq. m) weight or 0.0162 inch (0.41 mm) thick.
  3. Fabricate continuous flashings in sections 96 inches (2400 mm) long minimum, but not exceeding 12 feet (3.7 m). Provide splice plates at joints of formed, smooth metal flashing.
  4. Fabricate metal drip edges from stainless steel. Extend at least 3 inches (76 mm) into wall and 1/2 inch (13 mm) out from wall, with outer edge bent down 30 degrees and hemmed.
  5. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches (76 mm) into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch (19 mm) and down into joint 1/4 inch (6 mm) to form a stop for retaining sealant backer rod.
- B. Flexible Flashing: Use **one of** the following unless otherwise indicated:
- C. Solder and Sealants for Sheet Metal Flashings.
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from **neoprene, urethane or PVC**.
- B. Weep/Vent Products: Use **one of** the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard.
    - a.

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2. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth **1/8 inch (3 mm)** less than depth of outer wythe; in color selected from manufacturer's standard.
  3. Aluminum Weep Hole/Vent: Units made from sheet aluminum, designed to fit into a head joint and consisting of a vertical channel, with louvers stamped in web and with a top flap to keep mortar out of the head joint; factory primed and painted before installation to comply with Section 099113 "Exterior Painting" in color selected by Architect.
  4. Vinyl Weep Hole/Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.

C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Configuration: Provide one of the following:
  - a. Strips, full depth of cavity and **10 inches (250 mm)** high, with dovetail-shaped notches **7 inches (175 mm)** deep that prevent clogging with mortar droppings.
  - b. Strips, not less than **1-1/2 inches (38 mm)** thick and **10 inches (250 mm)** high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
  - c. Sheets or strips, full depth of cavity and installed to full height of cavity.

## 2.6 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

- 1.



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2.7 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use **portland cement-lime or masonry cement** mortar unless otherwise indicated.
  - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Use Type N unless another type is indicated.
- D. Pigmented Mortar: Use colored cement product **or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.**
  - 1. Pigments shall not exceed 10 percent of portland cement by weight.
  - 2. Pigments shall not exceed 5 percent of **masonry cement or mortar cement** by weight.
  - 3. Application: Use pigmented mortar for exposed mortar joints.
- E. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates and natural color or white cement as necessary to produce required mortar color.
  - 1. Mix to match Architect's sample.
  - 2. Application: Use colored aggregate mortar for exposed mortar joints.

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.

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- 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 C67. 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 exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). **Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).**

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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. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay 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.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.5 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to **wall framing and concrete and masonry backup** with **seismic** masonry-veneer anchors to comply with the following requirements:
  - 1. Fasten **screw-attached and seismic** anchors **through sheathing to wall framing and to concrete and masonry backup** with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
  - 2. Embed **tie sections connector sections and continuous wire** in masonry joints.
  - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  - 4. Space anchors as indicated, but not more than **18 inches (458 mm)** o.c. vertically and **24 inches (610 mm)** o.c. horizontally, with not less than one anchor for each **2 sq. ft. (0.2 sq. m)** of wall area. Install additional anchors within **12 inches (305 mm)** of openings and at intervals, not exceeding **8 inches (203 mm)**, around perimeter.
  - 5. Space anchors as indicated, but not more than **16 inches (406 mm)** o.c. vertically and **25 inches (635 mm)** o.c. horizontally, with not less than one anchor for each **3.5 sq. ft. (0.33 sq. m)** of wall area. Install additional anchors within **12 inches (305 mm)** of openings and at intervals, not exceeding **36 inches (914 mm)**, around perimeter.

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6. Space anchors as indicated, but not more than **18 inches (458 mm)** o.c. vertically and horizontally. Install additional anchors within **12 inches (305 mm)** of openings and at intervals, not exceeding **24 inches (610 mm)**, around perimeter.

- B. Provide not less than **2 inches (50 mm)** of airspace between back of masonry veneer and face of **sheathing insulation]**

### 3.6 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete to comply with the following:
  1. Provide an open space not less than **2 inches (50 mm)** wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  3. Space anchors as indicated, but not more than **24 inches (610 mm)** o.c. vertically and **36 inches (915 mm)** o.c. horizontally.

### 3.7 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. **Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.**
- B. Install flashing as follows unless otherwise indicated:
  1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape **as recommended by flashing manufacturer.**
  2. At lintels and shelf angles, extend flashing a minimum of **6 inches (150 mm)** into masonry at each end. At heads and sills, extend flashing **6 inches (150 mm)** at ends and turn up not less than **2 inches (50 mm)** to form end dams.
  3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
  4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing **1/2 inch (13 mm)** back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.

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- C. Install weep holes in veneers in head joints of first course of masonry immediately above embedded flashing.
    - 1. Use **specified weep/vent products or open-head joints** to form weep holes.
    - 2. Space weep holes **24 inches (600 mm)** o.c. unless otherwise indicated.
  - CI. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
  - CII. Install vents in head joints in exterior wythes at spacing indicated. Use **specified weep/vent products or open-head joints** to form vents.
    - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
  - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
- C. Testing Prior to Construction: One set of tests.
- D. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C67 for compressive strength.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C780.

### 3.9 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.

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- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner.
  3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.10 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. 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 042613

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fixed aluminum industrial stairs.
- B. Guard rail systems.
- C. Ladder safety posts.

1.2 REFERENCES

- A. ANSI A14.3: Ladders - Fixed - Safety Requirements.
- B. ANSI A14.9: Safety Requirements for Ceiling Mounted Disappearing Climbing Systems.
- C. OSHA 1910.23: Ladders.
- D. OSHA 1910.25: Stairways.
- E. OSHA 1910.28: Duty to have fall protection and falling object protection.
- F. OSHA 1910.29: Fall protection systems and falling object protection-criteria and practices.

1.3 SUBMITTALS

- A. 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.
- B. Shop Drawings for Stairs:
  - 1. Plan and section of stair installation.
  - 2. Indicate rough opening dimensions for ceiling and/or roof openings.
- C. Shop Drawings for Ladders:
  - 1. Plan and section of stair installation including footings, columns treads, risers, railings, guardrails, removeable rails, attachment to building, etc..
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches

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(150 mm) square representing actual product, color, and patterns.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Rebuild mock-up area as required to produce acceptable work.

#### 1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Store products in manufacturer's unopened packaging until ready for installation. Store stairway until installation inside under cover. If stored outside, under a tarp or suitable cover.
- C. Handle materials to avoid damage.

#### 1.7 PROJECT CONDITIONS

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

#### 1.8 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. Limited Warranty: Provide manufacturer's standard limited five year warranty against defective material and workmanship, covering parts only, no labor or freight. Defective parts, if deemed so by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant which warrants same.

### PART 2 PRODUCTS



## METAL STAIRS

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## 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Precision Ladders, LLC, which is located at: P. O. Box 2279; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Fax: 423-586-2091; Email:[request info \(info@PrecisionLadders.com\)](mailto:info@PrecisionLadders.com); Web:<http://www.PrecisionLadders.com>
- B. Substitutions: Permitted.

## 2.2 FIXED ALUMINUM INDUSTRIAL STAIRS

- A. Fixed Aluminum Industrial Stair: Precision Ladders Fixed Aluminum Industrial Stairway shall be Model PS-132 (verify current model) as manufactured by Precision Ladders, LLC. Match stair shown on drawings.
  - 1. Performance Standard: Units shall be designed and manufactured to meet or exceed OSHA 1910.25.
  - 2. Capacity: Supports a load of 1000 lb (454 kg) without failure.
  - 3. Degree of Incline: 30 to 45 degrees. Comply with Code requirements from local jurisdiction.
  - 4. Riser height and tread depth shall meet Code requirements.
  - 5. Stringers: Extruded aluminum structural channel 8 inches X 2.29 inches X 1/4 inch (203 mm X 58 mm X 6 mm).
  - 6. Treads: Aluminum bar grating treads to be both welded and bolted to stringer.
  - 7. Tread mounting hardware: 3/8 inch (9.5 mm) round stainless steel hex bolts.
  - 8. Mounting Brackets:
    - a. Floor Brackets: 4 inches X 4 inches X 1/4 inch (102 mm X 102 mm X 6 mm) aluminum angle.
    - b. Top Brackets: 4 inches to 6 inches tall X 2 inches (102 mm X 152 mm X 51 mm) mounting flange X 1/4 inch (6 mm) thick X 6 inches X 10 inches (152 mm X 254 mm) long aluminum angle. Top mounting bracket size is determined by stair's rise & run.
- B. Handrail:
  - 1. 1-1/4 inches (32 mm) Schedule 40 aluminum pipe, 6005-T5, providing a 1.6 inch (41 mm) OD.
  - 2. Internal aluminum fittings. Welds will be raised but smooth.
- C. Platform:
  - 1. Surface: Aluminum, 6005-T5, bar grating treads.
  - 2. Toe Boards: 4 x 1/4 inch (102 x 6 mm) aluminum, 6005-T5.
  - 3. Handrails: 1-1/4 inches (32 mm) Schedule 40 aluminum pipe, 6005-T5, providing a 1.6 inch (41 mm) OD.
- D. Finish: Mill finish.

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2.3 METAL GUARD RAIL SYSTEM

- A. Aluminum Guard Rail System: Model AGRS-H as manufactured by Precision Ladders, LLC. Provide removeable rail at long side of platform at top of stair.
- B. Performance: Unit shall comply with OSHA 1910.28 and OSHA 1910.29.
- C. Configuration: Floor mounted.
- D. Size: see drawings for all dimensions.
- E. Capacity: Supports a load of 200 lb (91 kg) applied in any direction.
- F. Components:
  - 1. Vertical and Horizontal Rails: Aluminum, 6005-T5, 1-1/4 inches (32 mm) Schedule 40 Pipe with a 1-5/8 inches (42 mm) OD.
  - 2. Brackets:
  - 3. Hardware: Corrosion resistant hardware and fasteners.
- G. Finish: Mill finish aluminum.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved submittals. Install in proper relationship with adjacent construction.

3.4 PROTECTION

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

END OF SECTION

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SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Framing with engineered wood products.
3. Shear wall panels.
4. Rooftop equipment bases and support curbs.
5. Wood blocking, **cants**, and nailers.
6. Wood furring **and grounds**.
7. Wood sleepers.
8. Plywood backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
  2. Fire-retardant-treated wood.
  3. Engineered wood products.
  4. Shear panels.
  5. Power-driven fasteners.
  6. Post-installed anchors.
  7. Metal framing anchors

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PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber indicated to receive a stained or natural finish, **mark grade stamp on end or back of each piece.**
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: **15 percent for 2-inch nominal (38-mm actual) thickness or less; 19 percent for more than 2-inch nominal (38-mm actual) thickness** unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
  - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 **for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.**
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. **Do not use inorganic boron (SBX) for sill plates.**
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

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D. Application: Treat **all rough carpentry unless otherwise indicated**

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, **furring, stripping**, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than **18 inches (460 mm)** above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than **10.5 feet (3.2 m)** beyond the centerline of the burners at any time during the test.
1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. **Kiln-dry plywood after treatment to maximum moisture content of 15 percent.**
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat **all rough carpentry unless otherwise indicated.**
1. Framing for raised platforms.
  2. Framing for stages.

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3. Concealed blocking.
4. Framing for non-load-bearing partitions.
5. Framing for non-load-bearing exterior walls.
6. Roof construction.
7. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: **Construction or No. 2** grade.

1. Application: **Interior partitions not indicated as load bearing.**
2. Species:
  - a. Southern pine or mixed southern pine; SPIB.
  - b. Northern species; NLGA.
  - c. Eastern softwoods; NeLMA.
  - d. Western woods; WCLIB or WWPA.

B. Framing Other Than Non-Load-Bearing Partitions: **Construction or No. 2** grade.

1. Application: Framing other than **interior partitions not indicated as load bearing.**
2. Species:
  - a. Hem-fir (north); NLGA.
  - b. Southern pine; SPIB.
  - c. Douglas fir-larch; WCLIB or WWPA.
  - d. Southern pine or mixed southern pine; SPIB.
  - e. Spruce-pine-fir; NLGA.
  - f. Douglas fir-south; WWPA.
  - g. Hem-fir; WCLIB or WWPA.
  - h. Douglas fir-larch (north); NLGA.
  - i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. Framing Other Than Non-Load-Bearing Partitions: Any species and grade with a modulus of elasticity of at least **1,500,000 psi (10 350 MPa)** OR **1,300,000 psi (8970 MPa)** OR **1,100,000 psi (7590 MPa)** thickness and **12-inch nominal (286-mm actual)** width for single-member use.

1. Application: Framing other than **interior partitions not indicated as load-bearing.**

D. Exposed Framing: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

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1. Species and Grade: As indicated above for load-bearing construction of same type.

## 2.5 ENGINEERED WOOD PRODUCTS

- A. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  1. Extreme Fiber Stress in Bending, Edgewise: **3100 psi (21.3 MPa)** ]OR **2900 psi (20.0 MPa)** depth members.
  2. Modulus of Elasticity, Edgewise: **2,000,000 psi (13 700 MPa)** OR **1,800,000 psi (12 400 MPa)**
- B. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D 5055.
  1. Web Material: **Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1**
  2. Structural Properties: Depths and design values not less than those indicated.
  3. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.
- C. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.
  1. Manufacturer: Provide products by same manufacturer as I-joists.
  2. Material: **product made from any combination solid lumber, wood strands, and veneers.**
  3. Thickness: **1 inch (25 mm).**
  4. Comply with APA PRR-401, **rim board** grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

## 2.6 SHEAR WALL PANELS

- A. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood or OSB sheathing.
- B. Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized-steel panel, steel top and bottom plates, and wood studs.



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- C. Allowable design loads, as published by manufacturer, shall meet or exceed those of building codes and **of products of manufacturers listed**. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.7 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
  2. Nailers.
  3. Rooftop equipment bases and support curbs.
  4. Cants.
  5. Furring.
  6. Grounds.
- B. Dimension Lumber Items: **Construction or No. 2** grade lumber of any species.
- C. Concealed Boards: **15** percent maximum moisture content and **any of** the following species and grades:
1. Mixed southern pine or southern pine; No. **2** grade; SPIB.
  2. Eastern softwoods; No. **2** Common grade; NeLMA.
  3. Northern species; No. **2** Common grade; NLGA.
  4. Western woods; **Construction or No. 2 Common** grade; WCLIB or WWPA.

2.8 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, **Exterior, A-C** in thickness indicated or, if not indicated, not less than **3/4-inch (19-mm)** nominal thickness.

2.9 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners **of Type 304 stainless steel**.

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- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on **ICC-ES AC01** as appropriate for the substrate.

2.10 METAL FRAMING ANCHORS

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those **of products of manufacturers listed**. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, **G60 (Z180)** coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); **G185 (Z550)** coating designation; and not less than **0.036 inch (0.9 mm)** thick.
  - 1. Use for wood-preserved-treated lumber and where indicated.

2.11 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; **1-inch (25-mm)** nominal thickness, compressible to **1/32 inch (0.8 mm)**; selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, **1/4 inch (6.4 mm)** thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, **butyl rubber** compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than **0.025 inch (0.6 mm)**.
- D. Adhesives for Gluing **Furring** to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

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PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate **furring**, nailers, blocking, **grounds**, and similar supports to comply with requirements for attaching other construction.
- D. Install shear wall panels to comply with manufacturer's written instructions.
- E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  - 3. ICC-ES evaluation report for fastener.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

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- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes **wet enough that moisture content exceeds that specified**, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

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SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking, **cants**, and nailers.
4. Wood furring **and grounds**.
5. Wood sleepers.
6. Utility shelving.
7. Plywood backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

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1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, **mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.**
  3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: **15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness** unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 **for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.**
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. **Do not use inorganic boron (SBX) for sill plates.**
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat **all miscellaneous carpentry unless otherwise indicated.**
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  2. Wood sills, sleepers, blocking, **furring, stripping,** and similar concealed members in contact with masonry or concrete.
  3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  4. Wood framing members that are less than **18 inches (460 mm)** above the ground in crawlspaces or unexcavated areas.
  5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame

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front not extending more than **10.5 feet (3.2 m)** beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
  2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
  3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841. **For enclosed roof framing, framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.**
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. **Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.**
- C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- D. Application: Treat **all miscellaneous carpentry unless otherwise indicated.**
1. Framing for raised platforms.
  2. Concealed blocking.
  3. Roof framing and blocking.
  4. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
  5. Plywood backing panels.

#### 2.4 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: **Construction or No. 2** grade of any species.
- B. Other Framing: **Construction, Stud, or No. 3** grade of **the following** species:
1. Hem-fir (north); NLGA.
  2. Southern pine; SPIB.
  3. Douglas fir-larch; WCLIB or WWPA.
  4. Southern pine or mixed southern pine; SPIB.
  5. Spruce-pine-fir; NLGA.

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6. Douglas fir-south; WWPA.
7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-larch (north); NLGA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
  3. Rooftop equipment bases and support curbs.
  4. Cants.
  5. Furring.
  6. Grounds.
  7. Utility shelving.
- B. Dimension Lumber Items: **Construction or No. 2** grade lumber of any species.
- C. Concealed Boards: **19** percent maximum moisture content of **any of the following** species and grades:
  1. Mixed southern pine or southern pine, **No. 2** grade; SPIB.
  2. Eastern softwoods, **No. 2** Common grade; NELMA.
  3. Northern species, **No. 2** Common grade; NLGA.
  4. Western woods, **Construction or No. 2 Common** grade; WCLIB or WWPA.

2.6 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, **Exterior, A-C** in thickness indicated or, if not indicated, not less than **3/4-inch (19-mm)** nominal thickness.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners **of Type 304 stainless steel**.



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- B. Screws for Fastening to Metal Framing: **ASTM C 1002**, length as recommended by screw manufacturer for material being fastened.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.8 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing **Furring and Sleepers** to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
  - 1. Retain "Flexible Flashing" Paragraph below if required as a separator between preservative-treated wood and metal decking.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, **butyl rubber** compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than **0.025 inch (0.6 mm)**.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate **furring**, nailers, blocking, **grounds**, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

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1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  3. ICC-ES evaluation report for fastener.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 06 17 53  
SHOP-FABRICATED WOOD TRUSSES

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PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Wood roof trusses.
  - 2. Wood girder trusses.

1.2 BRACING

- A. Provide wood truss bracing during erection of trusses.

1.3 ACTION SUBMITTALS

- A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.
- B. Shop Drawings: Show fabrication and installation details for trusses.
  - 1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
  - 2. Indicate sizes, stress grades, and species of lumber.
  - 3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
  - 4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
  - 5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
  - 6. Show splice details and bearing details.
- C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

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1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss-fabricating firm.
- B. Evaluation Reports: For the following, from ICC-ES:
  - 1. Metal-plate connectors.
  - 2. Metal truss accessories.

1.5 QUALITY ASSURANCE

- A. Wood Truss Shop Drawing submittal to contain all layouts, details, connections, etc. Drawings shall bear the stamp of a Georgia Registered Structural Engineer.
- B. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.
  - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
  - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- C. Fabricator Qualifications: Shop that **participates in a recognized quality-assurance program, complies with quality-control procedures in TPI 1, and involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.**

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations in SBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design metal-plate-connected wood trusses.

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- B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1.
- C. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.
- D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

## 2.2 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of any rules-writing agency certified by the American Lumber Standard Committee (ALSC) Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Provide dry lumber with **15** percent maximum moisture content at time of dressing.
- B. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in **Section 061000 "Rough Carpentry."**

## 2.3 METAL CONNECTOR PLATES

- A. General: Fabricate connector plates to comply with TPI 1.
- B. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); **G60 (Z180)** coating designation; and not less than **0.036 inch (0.9 mm)** thick.

## 2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
  - 2. Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.

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2.5 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Allowable design loads, as published by manufacturer, shall comply with or exceed those **indicated or required by the current edition of the International Building Code**. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, **G60 (Z180)** coating designation.

2.6 FABRICATION

- A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly, with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
  - 1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- B. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
- F. Securely connect each truss ply required for forming built-up girder trusses.

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- G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
    - 1. Install bracing to comply with **Section 061000 "Rough Carpentry. Section 061053 "Miscellaneous Rough Carpentry."**
    - 2. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.
  - H. Install wood trusses within installation tolerances in TPI 1.
  - I. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.
  - J. Replace wood trusses that are damaged or do not comply with requirements.

END OF SECTION 061753

SECTION 07 21 00  
BUILDING INSULATION

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PART 1 - GENERAL

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
1. Polyisoanurate Boards – Provide 4” board on top of ceiling access door to mechanical deck.
  2. R-19 Batt insulation.
  3. R-40 Batt or blown Insulation.
- B. Related Sections: The following sections contain requirements that relate to this section:
1. "Gypsum Drywall"

**1.3 DEFINITIONS**

- A. Thermal Resistivity: Where the thermal resistivity of insulation products are designated by "r-values," they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

**1.4 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of insulation product specified.
- C. Samples for verification purposes in full-size units of each type of exposed insulation indicated for each color specified.
- D. Product test reports from and based on tests performed by qualified independent testing laboratory evidencing compliance of insulation products with requirements including r-values (aged values for plastic foam insulations), fire performance characteristics, perm ratings, water absorption ratings, and other properties, based on comprehensive testing of current products.

**1.5 QUALITY ASSURANCE**

- A. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction.



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Identify products with appropriate markings of applicable testing and inspecting organization.

1. Surface Burning Characteristic: ASTM E 84
2. Fire Resistance Ratings: ASTM E 119
3. Combustion Characteristics: ASTM E 136

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's recommendations for handling, storage, and protection during installation.
- B. Protect plastic insulation as follows:
  1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  2. Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.
  3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide insulation products of one of the following:
  1. Blown or batt Insulation (batt insulation in walls to provide moisture control – CertainTeed Smartbatt or equal:
    - a. CertainTeed Corp.
    - b. Owens Corning
    - c. Dow Industrives
    - d. OR EQUAL

**2.2 INSULATING MATERIALS**

- A. Polyisoanurate Boards –
- B. Kor-fil Block insulation or equal.
- C. R-40 Batt Insulation. R- 19 in walls.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates and conditions with Installer present, for compliance with requirements of the Sections in which substrates and related work are specified and to determine if other conditions

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affecting performance of insulation are satisfactory. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections that might puncture vapor retarders.

**3.3 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturer's instructions applicable to products and application indicated. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation.
- B. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

**3.4 INSTALLATION OF GENERAL BUILDING INSULATION**

- A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

- 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

**3.5 PROTECTION**

- A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

**END OF SECTION**

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**SECTION 07 42 13  
PREFORMED METAL WALL PANELS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION OF WORK**

- A. This section covers the pre-finished, pre-fabricated Architectural metal wall panel system. All metal trim, accessories, fasteners, insulation and sealants indicated on the drawings as part of this section.
- B. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specifications, apply to this section.

**1.2 SUMMARY**

- A. Section Includes
  - 1. Factory formed metal wall panels
- B. Related work specified elsewhere. (Note: select from the below or add appropriate sections)
  - 1. Wood Framing and Decking: Division 6 Rough Carpentry Section

**1.3 DEFINITIONS**

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, thermal, and accessories necessary for a complete weathertight system.

**1.4 QUALITY ASSURANCE**

- A. Petersen Aluminum Corp, Acworth, GA, 800-272-4482 products establish a minimum of quality required.
- B. Manufacturer and erector shall demonstrate experience of a minimum of five (5) years in this type of project.
- C. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.
- D. Panels shall be factory-produced only. No portable, installer-owned or installer-rented machines will be permitted.

**1.5 SUBSTITUTIONS**

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- A. The material, products and equipment specified in this section establish a standard for required function, dimension, appearance and quality to be met by any proposed substitution.

### **1.6 SYSTEM DESCRIPTION**

- A. Material to comply with:
1. ASTM A792/A792M Standard Specification for Sheet Steel, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip process

### **1.7 ROOF SYSTEM PERFORMANCE TESTING**

- A. General Performance: Metal wall panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation or other defects in construction.
- B. Panels to meet:
1. Metal Wall or Metal Soffit System shall be designed to meet applicable Local Building Code and the Soffit System shall have been tested by the Manufacturer per ASTM E-330 and have the applicable Load Tables published from this Air Bag testing for negative loads.

### **1.8 WARRANTIES**

- A. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finish within specified warranty period.
1. Exposed Panels Finish - deterioration includes the following:
    - a. Color fading more than 5 hunter units when tested according to ASTM D 2244
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214
    - c. Cracking, checking, peeling or failure of a paint to adhere to a bare metal.
  2. Warranty Period: 20 Years from the date of substantial completion
- B. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition

### **1.9 SUBMITTALS**

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- A. Furnish detailed drawings showing profile and gauge of exterior sheets, location and type of fasteners, location, gauges, shape and method of attachment of all trim locations and types of sealants, and any other details as may be required for a weather-tight installation.
  - B. Provide finish samples of all colors specified.
  - C. Shop drawings: Show fabrication and installation layouts of metal wall panels or metal soffit panels, details of edge conditions, panel profiles, corners, anchorages, trim, flashings, closures and accessories, and special details. Distinguish between factory and field-assembled work
  - D. Coordination Drawings: Plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installer of the items involved.
  - E. LEED Submittals
    - 1. Product data for Credit MR 4.1 and credit MR 4.2: Indicating the percentages by weight of postconsumer and preconsumer recycled content for products having recycled content.

#### **1.10 DELIVERY, STORAGE AND HANDLING**

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver components, sheets, metal wall panels and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- C. Unload, store and erect metal wall panels in a manner to prevent bending, warping, twisting and surface damage.
- D. Stack metal wall panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness. Do not store metal wall panels in contact with other materials that might cause staining, denting or other surface damage.
- E. Protect strippable protective coating on any metal coated product from exposure to sunlight and high humidity, except to the extent necessary for material installation.

#### **1.11 PROJECT CONDITIONS**

- A. Weather Limitations: proceed with installation only when existing and forecasted weather conditions permit metal wall panel work to be performed.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.1 PANEL DESIGN**

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- A. General: Provide factory-formed metal wall panels designed for wall, soffit and fascia applications where a flush or flat appearance is desired. A round interlock leg and concealed fastening system act to improve the flush appearance while providing additional strength.
  - B. Wall panels shall be Flush in 12" widths with 1" height.
  - C. Panels to be produced Smooth - Factory Standard.  
Specifier note: Factory standard is smooth unless specified.  
Specifier Note: Depending on producing factory, panels may be specified with venting strips or perforated, aluminum panels only, for soffit applications. Check with local factory for capabilities.
  - D. Forming: Use continuous end rolling method. No end laps on panels. No portable rollforming machines will be permitted on this project, no installer-owned or installer-rented machines will be permitted. It is the intent of the Architect to provide Factory-Manufactured panel systems only for this project.

## 2.2 ACCEPTABLE MANUFACTURERS

- A. This project is detailed around the metal wall product of Petersen Aluminum Corp, Acworth, GA, 800-272-4482, Flush Wall Panel.

## 2.3 MATERIALS AND FINISHES

- A. Preformed metal panels shall be fabricated of 22 GA, and shall be Herr-Voss corrective leveled for flat appearance.
- B. Color shall be Dark Bronze
- C. Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.
- D. If Strippable coating to be applied on the pre-finished panels to the top side to protect the finish during fabrication, shipping and handling, film shall be removed before installation.
- E. Trim: Trim shall be fabricated of the same material and finish to match the profile, and will be press broken in lengths of 10 to 12 feet. Trim shall be formed only by the manufacturer of their approved dealer. Trim to be erected in overlapped condition. Use lap strips only as indicated on drawings. Miter conditions shall be factory welded material to match the sheeting.
- F. Accessories/Fasteners: Fasteners shall be of type, material, size, corrosion resistance, holding power and other properties required to fasten miscellaneous framing members to

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substrates. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the wall panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces, except at designed points of roof panel fixity

G. Substrate shall be Nailbase

H. Underlayment

1. On all surfaces to be covered with metal wall panels, furnish and install a 40 mil "Peel & Stick membrane", required as outlined by metal panel manufacturer. Membrane to be a minimum of 40 mil thickness, smooth, non-granular, by one of the following manufacturers:
  - a. W.R. Grace "Ice & Water Shield"
  - b. Cetco Strongseal
  - c. Carlisle CCW WIP 300HT
  - d. Interwrap Titanium PSU
  - e. MFM Corp "Wind & Water Shield"
  - f. Polyguard Deck Guard HT or Polyglas HT
  - g. Tamko TW Tile and Metal Underlayment

I. Sealants

1. Provide two-part polysulfide class B non-sag type for vertical and horizontal joints or
2. One part polysulfide not containing pitch or phenolic extenders or
3. Exterior grade silicone sealant recommended by roofing manufacturer or
4. One part non-sag, gun grade exterior type polyurethane recommended by the roofing manufacturer.

## 2.4 FABRICATION

- A. Comply with dimensions, profile limitations, gauges and fabrication details shown and if not shown, provide manufacturer's standard product fabrication.
  1. Max panel length is 25'.
- B. Fabricate components of the system in factory, ready for field assembly.
- C. Fabricate components and assemble units to comply with fire performance requirements specified.
- D. Apply specified finishes in conformance with manufacturer's standard, and according to manufacturer's instructions.

## PART 3 - EXECUTION

### 3.1 INSPECTION

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- A. Examine alignment of structural steel and related supports, primary and secondary roof framing, solid roof sheathing, prior to installation.
  - B. For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.
  - C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 FASTENERS**

- A. Secure units to supports
- B. Place fasteners as indicated in manufacturer's standards.

### **3.3 INSTALLATION**

- A. Compliance: Comply with manufacturer's product data, recommendations and installation instructions for substrate verification, preparation requirements and installation.
- B. Panels shall be installed plumb and true in a proper alignment and in relation to the structural framing. The erector must have at least five years successful experience with similar applications.
- C. Install metal panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weather-tight installation.
- D. Provide uniform, neat seams.
- E. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leakproof installation.
- F. Remove all strippable coating and provide a dry-wipe down cleaning of the panels as they are erected.

### **3.4 DAMAGED MATERIAL**

- A. Upon determination of responsibility, repair or replace damaged metal panels and trim to the satisfaction of the Architect and Owner.

### **3.5 CLEANING**

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damage installed products. Clean installed products in accordance with manufacturer's instruction prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

**END OF SECTION**



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SECTION 07 50 00- METAL ROOF PANELS

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 standing-seam metal roof panels.
- B. Related Sections:
  - 1. Section 074293 "Soffit Panels" for metal panels used in horizontal soffit applications.
  - 2. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at the Fayette County Animal Shelter.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
  - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
  - 5. Review structural loading limitations of **deck and purlins and rafters** during and after roofing.
  - 6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
  - 7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.

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8. Review temporary protection requirements for metal panel systems during and after installation.
  9. Review procedures for repair of metal panels damaged after installation.
  10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
2. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 3 inches per 12 inches (1:5).

D. Calculations:

1. Include calculations with registered engineer seal, verifying roof panel and attachment method resist wind pressures imposed on it pursuant to applicable building codes.

E. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

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1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Manufacturer and Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in architectural sheet metal products.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Build mockup of typical roof area and eave, **including fascia, and soffit** as shown on Drawings; approximately **48 inches (1200 mm)** square by full thickness, including attachments, **underlayment**, and accessories.
  - 2. Build mockups for typical roof area only, including accessories.
    - a. Size: **48 inches (1200 mm)** by **48 inches (1200 mm)**.
    - b. **Each type of exposed seam and seam termination**
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

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- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
  - C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
  - D. Retain strippable protective covering on metal panels until installation. Remove as panels are being installed. Verify film is not left on installed panels.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Galvalume Substrate Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, or perforating.
    - b. Deterioration of metals and other materials beyond normal weathering.
  - 2. Warranty Period: 20 years and 6 months from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

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- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, chipping, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
  - C. Special Watertightness Warranty: Manufacturer's **standard form** in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain watertight, including leaks, within specified warranty period.
    - 1. Warranty Period: **20** years from date of Substantial Completion.
    - 2. Shop drawings must be provided to, reviewed, and approved by panel manufacturer prior to panel system installation.
    - 3. Inspections by panel system manufacturer technical representative are required. Perform first inspection when underlayment and flashing are in place and second inspection when the roof is complete.
  - CI. Special Installer Warranty: Furnish a written warranty signed by the Panel Applicator guaranteeing materials and workmanship for watertightness of the roofing system, flashings, penetrations, and against all leaks.
    - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 29 percent.
- B. Solar Reflectance Index (SRI): Three-year-aged SRI not less than **[64]** **[32]** or initial SRI not less than **[82]** **[39]** when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- C. Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for **[low]** **[steep]**-slope roof products.
- D. Energy Performance: Provide roof panels according to one of the following when tested according to CRRC-1:
  - 1. Three-year, aged solar reflectance of not less than **0.55** and emissivity of not less than **0.75**.

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- 2. Three-year, aged Solar Reflectance Index of not less than **64** when calculated according to ASTM E 1980.
  - E. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to **ASTM E 1592 UL 580**:
    - 1. Wind Loads: As indicated on Drawings.
    - 2. Other Design Loads: **As REQUIRED BY CODE.**
    - 3. Deflection Limits: For wind loads, no greater than **1/240** of the span.
    - 4. .
  - F. Air Infiltration: Air leakage of not more than **0.06 cfm/sq. ft. (0.3 L/s per sq. m)** when tested according to ASTM E 1680 and ASTM E 283 at the following test-pressure difference:
    - 1. Test-Pressure Difference: **6.24 lbf/sq. ft. (300 Pa).**
  - G. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 and ASTM E 331 at the following test-pressure difference:
    - 1. Test-Pressure Difference: **15 lbf/sq. ft. (718.2 Pa).**
  - H. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
    - 1. Uplift Rating: UL 90.
  - I. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
    - 1. Temperature Change (Range): **120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.**

## 2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
  - 1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

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2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.
  - B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels : Formed with vertical ribs at panel edges and **a flat pan** between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together.
    1. **Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Company; Cee-lock 22 gauge 11 1/2" coverage or comparable product by one of the following:**
      - a. AEP Span; A BlueScope Steel Company.
      - b. ATAS International, Inc.
      - c. Berridge Roofing
      - d. CENTRIA Architectural Systems.
      - e. Fabral.
      - f. Garland Company, Inc. (The).
      - g. IMETCO.
      - h. MBCI; a division of NCI Group, Inc.
      - i. McElroy Metal, Inc.
      - j. Merchant & Evans Inc.
      - k. Metal Sales Manufacturing Corporation.
      - l. VICWEST.
      - m. Exterior Finish: Kynar/Hylar.
      - n. Painted materials shall have a removable plastic film to protect the paint during roll forming, shipping and handling.
      - o. Color: **As selected by Architect from manufacturer's full range.**
      - p. Painted materials shall have a removable plastic film to protect the paint during roll forming, shipping and handling.
    2. Clips: **Continuous cee-rib clips.**
      - a. Material: **0.029 inch (0.74 mm)** nominal thickness, aluminum-zinc alloy-coated steel sheet.
    3. Panel Coverage: **11.5 inches (292 mm).**
    4. Panel Height: **1.5 inches (38 mm).**

2.3 UNDERLAYMENT MATERIALS

- A. Provide Ice and Water Shield on entire roof. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of **40 mils (1.02 mm)** thick,

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consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Mid-States Asphalt Quick Stick HT Pro
  - b. Polyglass Polystick MTS
  - c. Soprema Lastobond Shield HT
  - d. Tamko TW Underlayment or TW Metal & Tile Underlayment

#### 2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
  1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
  2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters: 6" box gutters formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch (2400-mm) long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches (914 mm) o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match either **metal roof panels** or **roof fascia and rake trim**.



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- E. Downspouts: 6" diameter round formed from same material as roof panels. Fabricate in 10-foot (3-m) long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.
  - F. Roof Curbs: Fabricated from same material as roof panels, 0.029 inch (0.74mm) nominal thickness; galvalume or stainless steel; supply an integral full-length cricket for curbs wider than 24 inches (610 mm) supported by a structural metal deck. Fabricate curb flashing 0.029 inch (0.74mm). On open framing, provide roof underlayment and decking at and about roof curb per roofing manufacturer's requirements. Maintain a minimum of 1/2 of roofing panel width on each side of roof curb, and start panels a minimum of 9 inches (229 mm) up slope of roof curb, flashing roofing panels to roof curb per roofing manufacturer's requirements.. Fabricate curb and subframing to withstand indicated loads of size and height of roof top equipment. Where required insulate roof curbs with rigid insulation.
  - G. Panel Fasteners: Zinc-coated steel, corrosion resisting steel, zinc cast head, or nylon capped steel, type and size as approved for the applicable loading requirements.
  - H. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
    - 1. Joint Sealant: Silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.

## 2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using factory set, non-adjustable, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

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1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  2. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
  3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
    - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

## 2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
  1. Kynar/Hylar Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat applied by panel manufacturer on a continuous coil coating line, with a top side dry film thickness of  $0.75 \pm 0.05$  mil (0.0013 mm) over  $0.2 \pm 0.05$  mil (0.0013 mm) primer coat, to provide a total dry film thickness of  $0.95 \pm 0.10$  mil (0.024 mm). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

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1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
  - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply ICE AND WATER SHIELF at ALL ROOF locations. Provide wrinkle free, in shingle fashion to shed water, and with end laps of not less than **6 inches (152 mm)** staggered **24 inches (610 mm)** between courses. Overlap side edges not less than **36 inches (914.4 mm)**. **Extend underlayment into gutter trough.** Roll laps with roller. Cover underlayment within 14 days or as directed by the underlayment product manufacturer.
  1. Apply over the entire roof surface.
- B. Flashings: Install flashings to cover underlayment.

3.4 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

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1. Shim or otherwise plumb substrates receiving metal panels to be level to **1/4 inch in 20 ft. (6 mm in 6.1 m).**
  2. Flash and seal metal panels at perimeter of all openings. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
  3. Locate and space fastenings in uniform vertical and horizontal alignment.
  4. Install flashing and trim as metal panel work proceeds.
  5. Panels should be continuous without end laps.
  6. Align bottoms of metal panels and fasten.
  7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
  2. Aluminum Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use stainless-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
1. Install clips to supports with self-tapping fasteners.
  2. Install pressure plates, if required, at locations indicated in manufacturer's written installation instructions.
  3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied vinyl weatherseal.
- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners

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where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
  2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
- H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than **36 inches (914 mm)** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch (25 mm)** away from walls; locate fasteners at top and bottom and at approximately **60 inches (1524 mm)** o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
  2. Connect downspouts to underground drainage system indicated.
- J. Roof Curbs: Install flashing around bases where they meet metal roof panels.
- K. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

### 3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of **1/4 inch in 20 feet (6 mm in 6 m)** on slope and location lines as indicated and within **1/8-inch (3-mm)** offset of adjoining faces and of alignment of matching profiles.

### 3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

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3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION**

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SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Roof curbs.
  - 2. Equipment supports.
  - 3. Relief vents.
  - 4. Ridge vents.
  - 5. Heat-and-smoke vents.
- B. Related Sections include the following:
  - 1. Division 6 Section "Rough Carpentry" for roof sheathing, wood cants, and wood nailers.
  - 2. Division 9 Section "Painting" for shop primers and field painting.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
  - 1. Size and location of roof accessories specified in this Section.
  - 2. Method of attaching roof accessories to roof or building structure.
  - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.

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- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for roof accessories with factory-applied color finishes.
  - E. Samples for Verification: For each type of exposed finish required, prepared on Samples in manufacturer's standard sizes, and of same thickness and material indicated for the Work. If finishes involve normal color or shade variations, include sample sets showing the full range of variations expected.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with the following:
  - 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
  - 2. NRCA's "Roofing and Waterproofing Manual" details for installing units.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Roof Curbs and Equipment Supports:
    - a. AES Industries, Inc.
    - b. Colony Custom Curbs.
    - c. Commodity Products Company, Inc.
    - d. Conn-Fab Sales, Inc.
    - e. Curbs Plus, Inc.
    - f. Custom Curb, Inc.
    - g. Gieske Custom Metal Fabricators.
    - h. Goeller Enterprises.
    - i. LMCurbs.
    - j. Loren Cook Company.
    - k. Metallic Products Corporation.
    - l. Pate Co.(The).
    - m. Roof Products & Systems Corp.
    - n. ThyCurb, Inc.
    - o. Uni-Curb, Inc.
    - p. Vent Products Co., Inc.



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2. Relief Vents:

- a. Aura Ventilation, Inc.
- b. Bristolite Skylights.
- c. Commodity Products Company, Inc.
- d. Dowco Products Group.
- e. Dur-Red Products, Inc.
- f. Goeller Enterprises.
- g. Metallic Products Corporation.
- h. Solar Group (The).
- i. ThyCurb, Inc.
- j. Trimco, Inc.
- k. Vent Products Co., Inc.
- l. Western Canwell.

3. Ridge Vents:

- a. Air Vent, Inc.
- b. Alcoa Building Products.
- c. Commodity Products Company, Inc.
- d. Cor-A-Vent, Inc.
- e. GAF Materials Corporation.
- f. Klauer Manufacturing Co.
- g. Metallic Products Corporation.
- h. Mid-America Building Products Corporation.
- i. Niff-Corr, Inc.
- j. Obdyke: Benjamin Obdyke, Inc.
- k. Petersen Aluminum Corp.
- l. Plyco Corporation.
- m. Solar Group (The).
- n. ThyCurb, Inc.
- o. Trimco, Inc.
- p. Trimline Roof Ventilation Systems.
- q. Western Canwell.
- r. Nystrom Products Co.
- s. O'Keeffe's Inc.
- t. Precision Stair Corporation.
- u. Roof Products & Systems Corp.
- v. ThyCurb, Inc.
- w. Trimco, Inc.
- x. Wasco Products, Inc.

4. Roof Walkways:

- a. GS Metals Corp.

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- b. Unistrut Corporation.
5. Hatch-Type Heat-and-Smoke Roof Vents:
- a. Babcock-Davis Hatchways, Inc.
  - b. Bilco Company.
  - c. Bristolite Skylights.
  - d. Custom Curb, Inc.
  - e. Dur-Red Products, Inc.
  - f. Goeller Enterprises.
  - g. Hi Pro International, Inc.
  - h. Milcor, Inc.
  - i. Naturalite Skylight Systems.
  - j. Nystrom Products Co.
  - k. O'Keeffe's Inc.
  - l. ThyCurb, Inc.
  - m. Wasco Products, Inc.
6. Drop-out, Dome-Type Heat-and-Smoke Vents:
- a. C/S Groups.
  - b. Custom Curb, Inc.
  - c. Dur-Red Products, Inc.
  - d. Goeller Enterprises.
  - e. Hi Pro International, Inc.
  - f. Milcor, Inc.
  - g. Naturalite Skylight Systems.
  - h. O'Keeffe's Inc.
  - i. Pate Co. (The).
  - j. Plasteco, Inc.
  - k. Wasco Products, Inc.

2.2 MATERIALS, GENERAL

- A. Aluminum Sheet: **ASTM B 209** (**ASTM B 209M**) for alclad alloy 3005H25 or alloy and temper required to suit forming operations, with mill finish, unless otherwise indicated.
- B. Extruded Aluminum: **ASTM B 221** (**ASTM B 221M**) alloy 6063-T52 or alloy and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.
- C. Galvanized Steel Sheet: ASTM A 653/A 653M with **G90** (**Z275**) coating designation; commercial quality, unless otherwise indicated.
  - 1. Structural Quality: **Grade 40** (**Grade 275**), where indicated or as required for strength.

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- D. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M with Class **AZ-50** (**AZ-150**) coating, structural quality, **Grade 40** (**Grade 275**), or as required for strength.
  - E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
  - F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
  - G. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for **15-mil** (**0.4-mm**) dry film thickness per coating.
  - H. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
  - I. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, A, and, as applicable to joint substrates indicated, O.
  - J. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.3 ROOF CURBS

- A. General: Provide roof curbs capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
- B. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum **0.0747-inch** (**1.9-mm**) thick, structural-quality, hot-dip galvanized or aluminum-zinc alloy-coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.
  - 1. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
  - 2. Provide manufacturer's standard rigid or semirigid insulation where indicated.
  - 3. Provide formed cants and base profile coordinated with roof insulation thickness.
  - 4. Fabricate units to minimum height of **8 inches** (**200 mm**), unless otherwise indicated.
  - 5. Sloping Roofs: Where slope of roof deck exceeds **1/4 inch per foot** (**1:48**), fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

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2.4 EQUIPMENT SUPPORTS

- A. General: Provide equipment supports capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
- B. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum ~~0.0747-inch~~ (1.9-mm-) thick, structural-quality, hot-dip galvanized or aluminum-zinc alloy-coated steel sheet; factory primed and prepared for painting with welded or sealed mechanical corner joints.
  - 1. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
  - 2. Fabricate units to minimum height of 8 inches (200 mm), unless otherwise indicated.
  - 3. Sloping Roofs: Where slope of roof deck exceeds 1/4 inch per foot (1:48), fabricate support units with height tapered to match slope to level tops of units.

2.5 RELIEF VENTS

- A. Low-Profile Gravity Ventilators: Provide units of sizes, style, and profile indicated; fabricated from the following materials and including the following features:
  - 1. Material: Galvanized steel sheet.
  - 2. Material: Aluminum sheet.
    - a. Finish: Prime painted.
    - b. Finish: Baked enamel.
    - c. Finish: High-performance organic coating.
    - d. Finish: Clear anodic.
    - e. Finish: Color anodic.
  - 3. Bird Screens: 1/2-inch- (13-mm-) square mesh with 0.062-inch- (1.6-mm-) diameter, stainless-steel wire.
  - 4. Insect Screens: 14-by-18 (1.5-by-1.1-mm) mesh with 0.0123-inch- (0.3-mm-) diameter, anodized aluminum wire in removable, rewirable frames.
  - 5. Manual Dampers: Designed for operation from floor directly below ventilator unit.
  - 6. Roof Curb Construction: Provide curb-mount units designed for installing 1-1/2-inch- (38-mm-) thick wood curbs.
  - 7. Roof Curb Construction: Provide self-flashing units with integral self-supporting double-wall aluminum curb, enclosing minimum 1-inch- (25-mm-) thick, glass-fiber board insulation (or equivalent), and with minimum 3-inch (75-mm) roof flanges.

2.6 RIDGE VENTS

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- A. General: Ventilating ridge cap with ventilating mesh providing a minimum net free area of 18 sq. in./ft. (380 sq. cm/m), of manufacturer's standard design.
1. Aluminum: Fabricate from sheet aluminum with baffles to prevent snow and rain entering and with weep holes to allow water to drain to roof. Provide required splice plates and end caps.
    - a. Finish: Clear anodic.
    - b. Finish: Color anodic.
    - c. Finish: Baked enamel.
    - d. Finish: High-performance organic coating.

2.7 ROOF WALKWAYS

- A. Metal-Grating Type: Formed-metal plank gratings consisting of C-shaped channels rolled from heavy sheet metal of thickness indicated, and punched in serrated diamond shape to produce raised slip-resistant surface and drainage holes. Provide support framing, brackets, connectors, nosings, and other accessories and components needed for complete installation. Include step units for changes in elevation.
1. Material: 0.07-inch (1.8-mm), structural-quality, galvanized steel sheet.
  2. For Flat Roofs: Provide resilient, hard rubber pads under each support unit to isolate supports from and protect roof membrane.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

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- B. Conversion-Coated and Factory-Primed Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below).
    - 1. Organic Coating: Air-dried primer of not less than 2.0-mil (0.5-mm) dry film thickness.
  - C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 607.1.
  - D. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.
    - 1. Color: As selected by Architect from the full range of industry colors and color densities.
  - E. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's specifications for cleaning, conversion coating, and painting.
    - 1. Color: As selected by Architect from manufacturer's full range.
  - F. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - 1. Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight.
    - 2. Fluoropolymer Three-Coat System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight.
      - a. Color and Gloss: As selected by Architect from manufacturer's full range.

## 2.10 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

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1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
  2. Shop Primer: Exterior galvanized metal primer per Division 9 Section "Painting."
- B. High-Performance Organic Finish: Cleaned and primed with inhibitive primer and organic coating as specified below. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Fluoropolymer Three-Coat System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 621 for coil-coated sheets.
    - a. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.
- B. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual," unless otherwise indicated,
- C. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.
- D. Flange Seals: Unless otherwise indicated, set flanges of accessory units in a thick bed of roofing cement to form a seal.
- E. Cap Flashing: Where required as component of accessory, install cap flashing to provide waterproof overlap with roofing or roof flashing (as counterflashing). Seal overlap with thick bead of mastic sealant.
- F. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

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- G. Heat-and-Smoke Vents: Locate, install, and test according to NFPA 204M.
  - H. Ridge Vents: Install according to manufacturer's written instructions.

3.2 CLEANING AND PROTECTION

- A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 077200



SECTION 07 72 01  
GUTTERS AND DOWNSPOUTS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof accessories of the following types:
  - 1. Gutters and downspouts.
  - 2. Gutters protection.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

1.3 REFERENCES

1.4 SUBMITTALS

- A. Submit Shop Drawings.
- 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. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable work.
- D. Provide 20-year no leak warranty and 20-year material warranty.

1.6 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

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- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
  - B. Handling: Handle materials to avoid damage.

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 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. Custom
- B. Substitutions: equals accepted..
- C. Requests for substitutions will be considered.

2.2 GUTTERS AND DOWNSPOUTS

- A. Gutter: Custom formed ogee steel gutters 22 gauge galvanized and painted with Kynar finish. Provide 6" box gutter.
- B. Mitered Corners:  
Miter Inside & Outside Corners.
- C. Downspouts & Elbows:
  - 1. Material Thickness: .22 gauge steel.
  - 2. Finish: Dark Bronze Anodized
  - 3. Profile: 4" round galvanized painted aluminum downspouts.
- D. Finish: Dark Bronze
- E. Accessories: Exposed finish to match gutters and downspouts. Material: .019 inch (0.48 mm) aluminum.
  - 1. End Caps: As required.
  - 2. Brick Ledge Jumper: As required.
  - 3. Pipe Clips: As required.
  - 4. Ferrule: As required.
  - 5. Spike: As required.
  - 6. Diamond Pipe Band : As required.
  - 7. Wrap Around Hangers: As required.

SECTION 07 22 01  
GUTTERS AND DOWNSPOUTS

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## 2.3 GUTTER PROTECTION

### A. Gutter Protection:

1. Product: TruGuard Gutter Protection as manufactured by Quality Edge.
  - a. Forward Nose - Maximum amount of surface tension, 14-3/16 inches (360 mm) handling more water.
  - b. Tri-Sectioned Rib Debris Separator - Allows debris to fall off at three different points.
  - c. Patented Smart Clip Bracket using Bridge Technology - Strengthens existing gutters and gives consistent surface tension.
  - d. Sustainable Material - Recycled aluminum alloy. 0.024 inch (0.61 mm) thick.
  - e. UV Paint System - Offers the best UV protection using a Kynar paint finish resisting fading and chalking ensuring consistent surface tension.
  - f. Brackets and accessories as required for a complete functioning system.
  - g. Panel: TruGuard Gutter Protection Panels.
  - h. Panel: High-Capacity Ported Panels.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install roofing accessories per manufacturer's instructions and requirements to provide performance as designed and maintain warranties offered.

### 3.4 PROTECTION

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

END OF SECTION

SECTION 08 11 13  
STANDARD STEEL DOORS AND FRAMES

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following products manufactured in accordance with SDI Recommended Standards:
1. Doors: Seamless, hollow or composite construction standard steel doors for interior and exterior locations.
  2. Frames: Pressed steel frames for doors, transoms, sidelights, mullions, interior glazed panels, and other interior and exterior openings of following type:
    - a. Welded unit type
  3. Assemblies: Provide standard steel door and frame assemblies as required for the following:
    - a. Labeled and fire rated.
  4. Provide factory primed doors and frames to be field painted.
  5. Provide steel frames and ¼" tempered glass at all interior doors with windows.
  6. Provide steel frames and insulated glass at all exterior doors with windows.
- B. Painting and special coating of primed doors and frames is specified in Division 9.
- C. Door hardware is specified in another Division 8 Section.
- D. Glass and Glazing ARE TO BE TEMPERED IN ALL DOORS.
- E. Building in of anchors and grouting of frames in masonry construction is specified in Division 4.

**1.3 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
  2. Indicate coordinate of glazing frames and stops with glass and glazing requirements.
- D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

**1.4 QUALITY ASSURANCE**

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.
- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.

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**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.
- B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches space between stacked doors to promote air circulation.

**PART 2 - PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Subject to compliance with requirements, provide standard steel doors and frames by one of the following:

**1. Standard Steel Doors and Frames:**

- a. Amweld Building Products, Inc.
- b. Ceco Corp
- c. Copco Door Co.
- d. Curries Company
- e. Deansteel Manufacturing Co.
- f. Fenestra Corp
- g. Kewanee Corp
- h. Mesker Door Co.
- i. Pioneer Industries
- j. Premier Products, Inc. (Formerly Dittco)
- k. Republic Builders Products
- l. Steelcraft Manufacturing Co.
- m. Willco Hollow Metal

**2.2 MATERIALS**

- A. Hot-Rolled Steel Sheets and Strips: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with ASTM A 525, with A60 or G60 coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used in galvanized frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

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STANDARD STEEL DOORS AND FRAMES

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- F. Shop Applied Paint: Apply after fabrication.
1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

**2.3 DOORS**

- A. Provide metal doors of types and styles or grades and models indicated on drawings or schedules.
- B. Provide metal doors of SDI grades and models specified below or as indicated on drawings or schedules:
1. Interior Doors: ANSI/SDI-100, Grade II, heavy-duty, Model 3 or 4, minimum 18-gage cold-rolled sheet steel faces.
  2. Exterior Doors: ANSI/SDI-100, Grade III, extra heavy-duty, Model 4, minimum 16-gage galvanized steel faces.
- C. Door Louvers: Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped blades formed of 24-gage cold-rolled steel set into minimum 20-gage steel frame.

**2.4 FRAMES**

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled steel.
1. Fabricate frames with mitered, coped, or welded corners.
  2. Form exterior frames from 14-gage galvanized steel.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

**2.5 FABRICATION**

- A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.
1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.
  2. Clearances: Not more than 1/8 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.
- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.
- C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.
- E. Fabricate exterior doors, panels, and frames from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels.
- F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- G. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236 OR ASTM C 976 on fully operable door assemblies.

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STANDARD STEEL DOORS AND FRAMES

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- 1. Unless otherwise indicated, provide thermal-rated assemblies with U factor of 0.41 Btu/(hr x sq ft x deg F.) or better.
  - H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
  - I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.
  - J. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.
  - K. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
    - 1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
    - 2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.
  - L. Glazing Stops: Minimum 20 gage steel.
    - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
    - 2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," unless otherwise indicated.
  - 1. Except for frames located at existing concrete, masonry or drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
  - 2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry Tee anchors.
  - 3. At existing concrete or masonry construction, provide 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb, set frames and secure to adjacent construction with bolts and masonry anchorage devices.
  - 4. Install fire-rated frames in accordance with NFPA Standard No. 80.
  - 5. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.
  - 6. In in-place drywall partitions install knock down slip-on drywall frames.
- C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.
  - 1. Install fire-rated doors with clearances as specified in NFPA Standard No. 30.

**3.2 ADJUST AND CLEAN**

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime

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STANDARD STEEL DOORS AND FRAMES

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- coat and apply touch-up of compatible air-drying primer.
- B. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION



SECTION 085113  
ALUMINUM WINDOWS

08 51 13-1

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Exterior operable aluminum windows.
    - a. Glazing is retained mechanically with gaskets on four sides. WINDOWS TO BE CONFIGURED AS SHOWN ON ELEVATIONS. SINGLE-HUNG OPERABLE BOTTOM SASH. COLOR TO BE SELECTED FROM MANUFACTURER'S FULL RANGE OF COLORS.
- B. Related Sections include the following:
  - 1. Division 7 Section "Building Insulation" for insulation materials field installed with aluminum-framed systems.
  - 2. Division 8 Section "Door Hardware" for hardware to the extent not specified in this Section.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
  - 1. Structural loads.
  - 2. Thermal movements.
  - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
  - 4. Dimensional tolerances of building frame and other adjacent construction.

SECTION 085113  
ALUMINUM WINDOWS

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5. Failure includes the following:
  - a. Deflection exceeding specified limits.
  - b. Thermal stresses transferred to building structure.
  - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
  - d. Glazing-to-glazing contact.
  - e. Noise or vibration created by wind and thermal and structural movements.
  - f. Loosening or weakening of fasteners, attachments, and other components.
  - g. Sealant failure.
  - h. Failure of operating units to function properly.
- B. Structural Sealant: Capable of withstanding tensile and shear stresses imposed by aluminum-framed systems without failing adhesively or cohesively. Provide sealant that fails cohesively before sealant releases from substrate when tested for adhesive compatibility with each substrate and joint condition required.
  1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
  2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate because sealant-to-substrate bond strength exceeds sealant's internal strength.
- C. Structural-Sealant Joints: Designed to produce tensile or shear stress in structural-sealant joints of less than **20 psi (138 kPa)**.
- D. Structural Loads:
  1. Wind Loads: As indicated on Drawings.
  2. Seismic Loads: As indicated on Drawings.
- E. Deflection of Framing Members:
  1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to **13 feet 6 inches (4.1 m)** and to 1/240 of clear span plus **1/4 inch (6.35 mm)** for spans greater

SECTION 085113  
ALUMINUM WINDOWS

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- than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below to less than 1/8 inch (3.2 mm) and clearance between members and operable units directly below to less than 1/16 inch (1.5 mm).
- F. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
  2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Durations: As required by design wind velocity but not less than 10 seconds.
- G. Windborne-Debris-Impact-Resistance-Test Performance: Provide aluminum-framed systems that pass large and small missile-impact tests and cyclic-pressure tests according to.
- H. Story Drift: Provide aluminum-framed systems that accommodate design displacement of adjacent stories indicated.
1. Design Displacement.
  2. Test Performance: Meeting criteria for passing based on building occupancy type when tested according to AAMA 501.4 at design displacement and 1.5 times design displacement.
- I. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

SECTION 085113  
ALUMINUM WINDOWS

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1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
2. 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.
  - a. Test High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
  - b. Test Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C) .
  - c. Test Interior Ambient-Air Temperature: 75 deg F (24 deg C) ASTM E 283 requires using a static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa), unless otherwise indicated, which is equivalent to a 25-mph (40-km/h) wind. Static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa) is equivalent to a 50-mph (80-km/h) wind.
- . Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- K. Water Penetration Under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- L. Water Penetration Under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
  1. Maximum Water Leakage: According to AAMA 501.1. No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

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- M. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
- N. Average Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having average U-factor of not more than 0.69 Btu/sq. ft. x h x deg F (3.92 W/sq. m x K) when tested according to AAMA 1503.
- O. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having minimum STC 32 according to ASTM E 413 and an OITC 26 according to ASTM E 1332, as determined by testing according to ASTM E 90.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 2. Include details of provisions for system expansion and contraction and for draining moisture occurring within the system to the exterior.
  - 3. For entrances, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of systems, made from 12-inch (300-mm) lengths of full-size components and showing details of the following:
  - 1. Joinery.

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- 2. Anchorage.
- 3. Expansion provisions.
- 4. Glazing.
- 5. Flashing and drainage.
  
- F. Welding certificates.
  
- G. Qualification Data: For Installer and testing agency.
  
- H. Preconstruction Sealant Test Reports: For structural-sealant-glazed systems, compatibility and adhesion test reports from sealant manufacturer indicating that materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with sealants. Include sealant manufacturer's interpretation of test results for sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
  
- I. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems.
  
- . Structural-Sealant-Glazing Quality-Control Program: Developed specifically for Project.
  
- K. Structural-Sealant-Glazing Quality-Control Program Reports: Documenting quality-control procedures and verifying results for aluminum-framed systems.
  
- L. Field quality-control test and inspection reports.
  
- M. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
  
- N. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.
  - 1. Engineering Responsibility: Preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units

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in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.

- a. Include structural-sealant-glazing quality-control program development and reporting complying with ASTM C 1401 recommendations including, but not limited to, system material qualification procedures, preconstruction sealant-testing program, and procedures and intervals for system fabrication and installation reviews and checks.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 699 for testing indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
  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.
- D. Preconstruction Sealant Testing: For structural-sealant-glazed systems, perform sealant manufacturer's standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants and each condition required by aluminum-framed systems.
  1. Test a minimum of five samples of each metal, glazing, and other material.
  2. Prepare samples using techniques and primers required for installed systems.
  3. For materials that fail tests, determine corrective measures required to prepare each material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.
- E. Accessible Entrances: Comply with the Georgia Accessibility Code, the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility

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Guidelines for Buildings and Facilities (ADAAG)." [ICC/ANSI A117.1.] [FED-STD-795, "Uniform Federal Accessibility Standards."] Delete first paragraph below if no welding. Retain "Welding certificates" Paragraph in "Submittals" Article if retaining below.

- F. Welding: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code--Aluminum."
- G. Structural-Sealant Glazing: Comply with recommendations in ASTM C 1401, "Guide for Structural Sealant Glazing".
- H. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.
- I. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Build mockup of typical wall area as shown on Drawings.
  - 2. Field testing shall be performed on mockups according to requirements in Part 3 "Field Quality Control" Article.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating aluminum-framed systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

- A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.



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1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Noise or vibration caused by thermal movements.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - d. Adhesive or cohesive sealant failures.
    - e. Water leakage through fixed glazing and framing areas.
    - f. Failure of operating components to function properly.
  2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The design for aluminum-framed systems is based on per the manufacturer listed below.. Color to be Dark Bronze. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
1. Quaker – Keystone Series Double Hung. Provide Glass green-tinted, lowE, Argon gas, 5/8" insulated. Single-hung and fixed windows with simulated true-divided lite with configurations as shown on drawings.
  2. Equal

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish to be *Bronze Anodized*.
1. Sheet and Plate: **ASTM B 209** (ASTM B 209M).

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2. Extruded Bars, Rods, Profiles, and Tubes: **ASTM B 221** (ASTM B 221M).
  3. Extruded Structural Pipe and Tubes: ASTM B 429.
  4. Structural Profiles: ASTM B 308/B 308M.
  5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
  2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
  3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
- 2.3 FRAMING SYSTEMS
- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Construction: Framing members are composite assemblies of two separate extruded-aluminum components permanently bonded by an elastomeric material of low thermal conductance.
- 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.
1. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
  2. Reinforce members as required to receive fastener threads.
  3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

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- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.
- E. Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials. Form exposed flashing from sheet aluminum finished to match framing and of sufficient thickness to maintain a flat appearance without visible deflection.
- F. Framing System Gaskets and Sealants: Manufacturer's standard recommended by manufacturer for joint type.

#### 2.4 GLAZING SYSTEMS

- A. Glazing Gaskets: Manufacturer's standard compression types, replaceable, molded or extruded, that maintain uniform pressure and watertight seal.
- B. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.
- C. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- D. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type and as follows:
  - 1. Structural Sealant: ASTM C 1184, neutral-curing silicone formulation compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant, and approved by structural-sealant manufacturer for use in aluminum-framed systems indicated.
    - a. Color: Black.
  - 2. Weather-seal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; neutral-curing silicone formulation compatible with structural sealant and other system components with which it comes in contact; and recommended by structural- and weather-seal-sealant and aluminum-framed system manufacturers for this use.
    - a. Color: Matching structural sealant.

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2.5 ACCESSORY MATERIALS

- A. Insulating Materials: As specified in Division 7 Section "Building Insulation."
- B. Joint Sealants: For installation at perimeter of aluminum-framed systems.
- C. 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.

2.6 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. 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 fitted joints with ends coped or mitered.
  - 3. Means to drain water passing joints, condensation occurring 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.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing (without projecting stops).
- E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device (dutchman) to retain glazing in place while structural sealant cures.
- F. Storefront Framing: Fabricate components for assembly using shear-block system.

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2.7 ALUMINUM FINISHES

Aluminum Storefront and Doors to be *Bronze Anodized* finish.

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.
- D. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
- E. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
- F. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight, unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Set continuous sill members and flashing in full sealant bed to produce weather-tight installation.

E. Install components plumb and true in alignment with established lines and grades, without warp or rack.

F. Install glazing as per industry standards.

1. Structural-Sealant Glazing:

- a. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

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- b. Install weather-seal sealant according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.
- G. Entrances: Install to produce smooth operation and tight fit at contact points.
  - 1. Exterior Entrances: Install to produce tight fit at weather stripping and weathertight closure.
  - 2. Field-Installed Hardware: Install surface-mounted hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- H. Install insulation materials as specified in Division 7 Section "Building Insulation."
- I. Install perimeter joint sealants to produce weather-tight installation.
- J. Erection Tolerances: Install aluminum-framed systems to comply with the following maximum tolerances:
  - 1. Location and Plane: Limit variation from true location and plane to **1/8 inch in 12 feet (3 mm in 3.7 m)**; **1/4 inch (6 mm)** over total length.
  - 2. Alignment:
    - a. Where surfaces abut in line, limit offset from true alignment to **1/16 inch (1.5 mm)**.
    - b. Where surfaces meet at corners, limit offset from true alignment to **1/32 inch (0.8 mm)**.
  - 3. Diagonal Measurements: Limit difference between diagonal measurement to **1/8 inch (3 mm)**.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing and inspecting of representative areas to determine compliance of installed systems with specified requirements shall take place as follows and in successive stages

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as indicated on Drawings. Do not proceed with installation of the next area until test results for previously completed areas show compliance with requirements.

1. Structural-Sealant Compatibility and Adhesion: Structural sealant shall be tested according to recommendations in ASTM C 1401.
    - a. Destructive test method, Method A, Hand Pull Tab (Destructive) in ASTM C 1401, Appendix X2 shall be used.
      - 1) A minimum of six areas on each building face shall be tested.
      - 2) Repair installation areas damaged by testing.
  2. Structural-Sealant Glazing Inspection: After installation of aluminum-framed systems is complete, structural-sealant glazing shall be inspected and evaluated according to ASTM C 1401 recommendations.
  3. Air Infiltration: Areas shall be tested for air leakage of 1.5 times the rate specified for laboratory testing under Part 1 "Performance Requirements" Article, but not more than 0.09 cfm/sq. ft. (0.03 L/s per sq. m), of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa), 6.24 lbf/sq. ft. (300 Pa).
  4. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum uniform and cyclic static-air-pressure difference of 0.67 times the static-air-pressure difference specified for laboratory testing under Part 1 "Performance Requirements" Article, but not less than 4.18 lbf/sq. ft. (200 Pa), and shall not evidence water penetration.
  5. Water Spray Test: Before installation of interior finishes has begun, a minimum area of 75 feet (23 m) by 1 story of aluminum-framed systems designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- C. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.



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3.4 ADJUSTING

- A. Entrances: Adjust operating hardware for smooth operation according to hardware manufacturers' written instructions.

END OF SECTION 085113

SECTION 08 71 10  
DOOR HARDWARE

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

PROVIDE PANIC HARDWARE ON ALL EXTERIOR DOORS, CROSS-CORRIDOR DOORS, AND AT EXTERIOR DOOR TO ELECTRICAL ROOM.

HARDWARE IS TO MATCH FAYETTE COUNTY'S HARDWARE STANDARD - **if applicable.**

ALL HARDWARE FINISHES TO BE SELECTED BY OWNER.

1.02 DESCRIPTION OF WORK

- A. Definition: "Builders Hardware" includes items known commercially as builders hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frames.
- B. Extent of finish hardware required is to be scheduled by hardware supplier based on the location and operation of each door. The Architect and Owner will review and verify the function of each and every door in the facility.
- C. Types of finish hardware required include the following:
1. Hinges
  2. Pivots
  3. Lock cylinders and keys
  4. Lock and latch sets
  5. Bolts
  6. Exit devices
  7. Push/pull units
  8. Closers
  9. Overhead holders
  10. Miscellaneous door control devices
  11. Door trim units
  12. Protection plates
  13. Weatherstripping, door seals
  14. Thresholds
  15. Electronic Security Products
  16. Silencers

## SECTION 08 71 10

### DOOR HARDWARE

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#### 1.03 QUALITY ASSURANCE:

- A. Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer, although several may be indicated as offering products complying with requirements.
- B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.
- C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or FM for types and sizes of doors required and complies with requirements of door and door frame labels.
  - 1. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware."

#### 1.04 SUBMITTALS

- A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division 1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.
- B. Hardware Schedule: Submit a hardware schedule in manner indicated below PREPARED BY A CERTIFIED, LICENSES HARDWARE SPECIFIER. Coordinate hardware with fire ratings, applications, doors, frames, and related work to ensure proper size, thickness, hand, function and finish of hardware.
- C. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
  - 1. Type, style, function, size and finish of each hardware item.
  - 2. Name and manufacturer of each item.
  - 3. Fastenings and other pertinent information.
  - 4. Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
  - 5. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
  - 6. Mounting locations for hardware.
  - 7. Door and frame sizes and materials.
- D. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of

## SECTION 08 71 10

### DOOR HARDWARE

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hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

- E. Samples: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.
  - 1. Samples will be returned to the supplier. Units which are acceptable and remain undamaged through submittal, review and field comparison procedures may, after final check of operation, be used in the work, within limitations of keying coordination requirements.
- F. Templates: Finish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

#### 1.05 PRODUCT HANDLING:

- A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of hardware, is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory hardware jointly with representatives of the hardware supplier and the hardware installer until each is satisfied that the count is correct.
- D. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- E. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

## PART 2 - PRODUCTS

### 2.01 SCHEDULED HARDWARE

**HARDWARE IS TO MATCH FAYETTE COUNTY'S HARDWARE STANDARD - VERIFY WITH OWNER.**

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is to be determined by the door use and location in conjunction with the Hardware Allowance contained in this Project Manual.

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- B. Manufacturer's product designations: One or more manufacturers are listed for each hardware type required. An asterisk (\*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this section.

#### 2.02 MATERIALS AND FABRICATION:

- A. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- B. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- C. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for the application hardware units by applicable ASNI A156 series standard for each type hardware item and with ASNI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
- D. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- E. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
- F. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of the type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
- G. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

#### 2.03 HINGES, BUTTS, AND PIVOTS:

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- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
  - B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.
  - C. Hinge Pins: Except as otherwise indicated, provide continuous hinges per door specification.
  - D. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.
  - E. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
  - F. Size of hinges: Unless otherwise scheduled, size hinges in accordance with the published recommendations of the specified manufacturer.

**2.04 LOCK CYLINDERS AND KEYING:**

- A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.
- B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), integrated with Owner's existing system.
- C. Equip locks with high security cylinders which comply with performance requirements for Grade 1 cylinders as listed in ANSI A156.5 and which have been tested for pick and drill resistance requirements of UL 437 and are UL listed.
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
- E. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
- F. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
- G. Key Material: Provide keys of nickel silver only.
- H. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
- I. Deliver keys to Owner's representative.

**2.05 LOCKS, LATCHES, AND BOLTS:**

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt.
  - 1. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.
  - 2. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

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- B. Lock Throw: Provide 3/4" minimum throw of latch and 1" throw of deadbolt. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
  - C. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze, or stainless steel, with minimum 12" long rod for doors up to 7'0" in height. Provide longer rods as necessary for doors exceeding 7'0" in height.
  - D. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in the open position.
  - E. Rabbeted Doors: Where rabbeted door stiles are indicated, provide special rabbeted front on lock and latch units and bolts.

**2.06 PUSH/PULL UNITS:**

- A. Concealed Fasteners: Provide manufacturer's special concealed fastener system for installation; through-bolted for matched pairs, but not for single units.

**2.07 CLOSERS AND DOOR CONTROL DEVICES:**

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A 117.1 provisions for door opening force and delayed action closing.
- C. Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and automatically close door under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.
  - 1. Provide integral smoke detector device in combination door closers and holders complying with UL 228.

**2.08 DOOR TRIM UNITS:**

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screw.
- B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.
- C. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop

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side and not more than 1/2" less than door width on pull side, plate heights shall be 36", 8", and 4" respectively. Armor plates on fire doors shall conform to NFPA 80.

1. Metal Plates: Stainless steel, .050" (U.S. 18 ga).

#### 2.09 WEATHERSTRIPPING:

- A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

#### 2.10 THRESHOLDS:

- A. General: Except as otherwise indicated provide standard metal threshold unit of type, size, and profile as shown or scheduled.

#### 2.11 SILENCERS:

- A. Provide silencers except at doors equipped with weatherstrip, soundseals, lighseals, or other gasketing. Provide 3 silencers per single door and 4 silencers per pair of doors.

#### 2.12 HARDWARE FINISHES:

- A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.
- B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.
- C. 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 for the applicable units of hardware by referenced standards.
- D. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials & Finishes Standard" by BHMA, including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

## PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated



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or required to comply with governing regulations, and except as may be otherwise directed by Architect.

- B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

#### 3.02 ADJUST AND CLEAN:

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

#### 3.03 FINISHES

All finishes to be US 26D. Hinges on metal doors shall be primed for painting, ANSI 600.  
Surface mounted door closers shall be painted to match adjacent hardware.

END OF SECTION

CEMENTITIOUS BACKER BOARD

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fiber cement backer board panels.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.

1.3 REFERENCES

- A. ANSI 108/A118/A136 - American National Standards for the Installation of Ceramic Tile.
- B. ANSI A108.11 - Installation of Cementitious Backer Units.
- C. ANSI A118.4 - Specifications for Latex Portland Cement Mortar
- D. ANSI A118.9- Cementitious Baker Units.
- E. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile
- F. ASTM C1288 - Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittals.
- 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. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum of 2 years experience with installation of similar

products.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store boards flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

## 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.

## 1.8 WARRANTY

- A. Product Warranty: limited product warranty against manufacturing defects:
  - 1. HardieBacker 1/2 inch (13 mm) nominal cement board for 20 years.
- B. Workmanship Warranty: application limited warranty for 2 years.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Fax: 949-367-4981; Email: [request info \(info@jameshardie.com\)](mailto:requestinfo@jameshardie.com); Web: [www.jameshardiecommercial.com](http://www.jameshardiecommercial.com)
- B. Substitutions: Equals permitted.
- C. Requests for approval of equal substitutions will be considered in accordance with provisions of Product Substitutions Section.

### 2.2 BACKERBOARD

- A. Type: HardieBacker 1/2 inch (13 mm) nominal cement board as manufactured by James Hardie Building Products, Inc.
- B. Material shall meet the following building code compliance:
  - 1. Non-asbestos fiber-cement board to comply with ASTM C1288 and ANSI A118.9.
  - 2. Board shall meet the building code compliance National Evaluation Report No. NER 405.
  - 3. US Department of Housing and Urban Development Materials Release 1268C.

### 2.3 FASTENERS

- A. Wood Framing fasteners
  - 1. Wood framing: 1-1/2 inches (32 mm) corrosion resistant (galvanized or stainless steel) roofing nails.
  - 2. Wood framing: 1-1/2 inches (32 mm) No. 8 by 0.375 inch (9.5 mm) HD self-drilling, corrosion resistant ribbed wafer head screws.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 WALL FRAMING

- A. Either vertical or horizontal, nominal 2 inches by 4 inches ( 51 mm by 102 mm) wood framing spaced a maximum of 24 inches (610 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications.
- B. To comply with ANSI A108.11, either vertical or horizontal, nominal 2 inches by 4 inches ( 51 mm by 102 mm) wood framing spaced a maximum of 16 inches (406 mm) on center with end joints staggered from adjacent courses in both vertical and horizontal applications.
- C. Either vertical or horizontal, minimum 20 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes with end joints staggered from adjacent courses in both vertical and horizontal applications.
- D. comply with ANSI A108.11, either vertical or horizontal, minimum 20 gauge 3-5/8 inches (92 mm) C-Stud 16 inches (406 mm) maximum on center metal framing complying with local building codes with end joints staggered from adjacent courses in both vertical and horizontal applications.
- E. Install a vapor barrier.
  - 1. Comply with building code regarding vapor barrier requirements.
  - 2. Repair any punctures or tears in vapor barrier prior to the installation of the board.

### 3.3 FLOOR FRAMING

- A. Design: Maximum deflection (dead and live load combined) for floor framing shall not exceed the following:
  - 1. Typical: L/360.
  - 2. Natural stone: L/270.

### 3.4 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.

### 3.5 INSTALLATION

- A. Install in accordance with manufacturer's instructions. Install sheets with 1/8 inch (3 mm) gap between sheets.
- B. Place fasteners 8 inches (152 mm) on center no closer than 3/8 inch (9.5 mm) from board edges and 2 inches (51 mm) from board corners.
- C. Boards shall be placed with a minimum 1/4 inch (6 mm) clearance from the floor surfaces and other horizontal tile termination locations, including above tub edges. This gap shall be free of adhesive and grout and filled with a flexible sealant.

- D. Boards shall be placed with a minimum 1/8 inch (3 mm) clearance from wall and cabinet bases, and other horizontal tile termination locations, including above tub edges. This gap shall be free of adhesive and grout and filled with a flexible sealant.
- E. Joints shall be reinforced with 2 inches (51 mm) wide, high-strength, coated, alkali-resistant, glass fiber reinforcing tape embedded into the wet mastic or modified thinset mortar and allowed to dry thoroughly.
- F. For large tiled areas, movement/control joints shall be provided in accordance with ANSI A108, Section AN-3.7 or as indicated on drawings.
- G. Wall tiles complying with ANSI A137.1 are attached to the board with flexible Type I mastic adhesives complying with ANSI A136.1, or acrylic or latex-modified thinset mortars complying with ANSI A118.4, in accordance with ANSI A108.

END OF SECTION

## SECTION 09 29 00

### GYPSUM BOARD

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Extent of each type of gypsum drywall construction required is indicated on Drawings.
- B. This Section includes the following types of gypsum board construction:
  - 1. Steel framing members to receive gypsum board
  - 2. Gypsum board (all to be Type X 5/8" except in wet areas use green-board, 5/8") screw-attached to steel framing and furring members

##### 1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA 505 for definitions of terms for gypsum board construction not otherwise defined in this section or other referenced standards.

##### 1.4 SUBMITTALS

- A. Product data from manufacturers for each type of product specified.

##### 1.5 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction.
  - 1. Provide fire-resistance-rated assemblies identical to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.
- B. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

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

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

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- C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Minimum Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously thereafter until drying is complete.
- C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

## PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

- 1. Steel Framing and Furring
  - a. Bostwick Steel Framing Co.
  - b. Dale Industries, Inc.e
  - c. Gold Bond Building Products Div., National Gypsum Co.
  - d. Incor, Inc.
  - e. Marino Industries Corp.
  - f. United States Gypsum Co.
- 2. Gypsum Boards and Related Products:
  - a. Centex American Gypsum Co.
  - b. Domtar Gypsum Co.
  - c. Georgia-Pacific Corp.
  - d. Gold Bond Building Products Div., National Gypsum Co.
  - e. United States Gypsum Co.

#### 2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

- A. General: provide components which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.
- B. Concrete Inserts: Inserts designed for attachment to concrete forms and for embedment in concrete,

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### GYPSUM BOARD

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fabricated from corrosion-resistant materials, with holes or loops for attachment of hanger wires and capability to sustain, without failure, a load equal to 3 times that imposed by ceiling construction, as determined from testing per ASTM E 488, conducted by an independent testing laboratory.

- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
- D. Channels: Cold-rolled Steel, 0.0598 inch minimum thickness of base (uncoated) metal and 7/16 inch wide flanges, protected with rust-inhibitive paint, and as follows:
  - 1. Carrying Channels: 2 inches deep, 590 lbs per 1000 ft., unless otherwise indicated.
- E. Steel Studs for Furring Channels: ASTM C 645, with flange edges bent back 90 deg and doubled over to form 3/16 inch minimum lip return), minimum thickness of base (uncoated) metal and minimum depth as follows:
  - 1. Thickness: 0.0329 inch, unless otherwise indicated
  - 2. Depth: 3-5/8 inches, unless otherwise indicated
- F. Steel Rigid Furring Channels: ASTM C 645, hat-shaped, depth of 7/8 inch, a minimum thickness of base (uncoated) metal as follows:
  - 1. Thickness: 0.0179 inch, unless otherwise indicated

#### 2.3 GYPSUM BOARD

- A. General: Provide gypsum board, all "green-board" (Georgia Pacific "Tough-Rock" or equal) in maximum lengths available to minimize end-to-end joints.
  - 1. Thickness: Provide gypsum board in thicknesses indicated to comply with ASTM C 840 for application system and support spacing indicated.
- B. Gypsum Wallboard: ASTM C 36, and as follows:
  - 1. Type: Green-board, water-resistant (Georgia Pacific "Tough-Rock" or equal, throughout the entire facility.
  - 2. Type: Type X for fire-resistance-rated assemblies
  - 3. Edges: Tapered
  - 4. Thickness: 5/8 inch
  - 5. Products: Subject to compliance with requirements, provide one of the following products where Type X gypsum wallboard is indicated:
    - a. "Gyprock Fireguard 'C' Gypsum Board"; Domtar Gypsum Co.
    - b. "Fire-Shield G"; Gold Bond Building Products, Div., National Gypsum Co.
    - c. "SHEETROCK Brand FIRECODE 'C' Gypsum Panels"; United States Gypsum Co.
- C. Gypsum Backing Board for Multi-Layer Applications: ASTM C 442 or, where backing board is not available from manufacturer, gypsum wallboard, ASTM C 36, and as follows:
  - 1. Type: Regular, unless otherwise indicated



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2. Type: Type X for fire-resistance-rated assemblies
3. Edges: Manufacturer's standard
4. Thickness: 5/8 inch

D. Water-Resistant Gypsum Backing Board: ASTM C 630, and as follows:

1. Type: Regular, unless otherwise indicated
2. Type: Type X for fire-resistance-rated assemblies
3. Thickness: 5/8 inch

#### 2.4 TRIM ACCESSORIES

A. Cornerbead and Edge Trim for Interior Installation: Provide corner beads, edge trim and control joints which comply with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal, plastic or metal combined with paper, with metal complying with the following requirement:
  - a. Sheet Steel zinc-coated by hot-dip process
2. Edge trim shapes indicated below by reference to designations of Fig. 1 in ASTM C 1047:
  - a. "LC" Bead, unless otherwise indicated
  - b. "LK" Bead with square nose for use with kerfed jambs
  - c. "L" Bead where indicated
  - d. "U" Bead where indicated
3. Metal Cornerbead and Edge Trim for Exterior Ceilings: Comply with the following requirements:
  1. Edge trim complying with ASTM C 1047, formed from rolled zinc, shape "LC" Bead per Fig. 1, unless otherwise indicated.

#### 2.5 GYPSUM BOARD JOINT TREATMENT MATERIALS

A. General: Provide materials complying with ASTM C 475, ASTM C 840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.

B. Joint Tape: Paper reinforcing tape, unless otherwise indicated.

C. Setting-Type Joint Compounds: Factory-prepackaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated for use as taping and topping compounds, use formulation for each which develops greatest bond strength and crack resistance and is compatible with other joint compounds applied over it.
2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base

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### GYPSUM BOARD

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for ceramic tile, use formulation recommended by gypsum board manufacturer for this purpose.

- D. Drying-Type Joint Compounds: Factory-prepackaged vinyl-based products complying with the following requirements for formulation and intended use.
1. Ready-Mix Formulation: Factory-premixed product
  2. Taping compound formulated for embedding tape and for first coat over fasteners and flanges of corner beads and edge trim.
  3. Topping compound formulated for fill (second) and finish (third) coats.
  4. All-purpose compound formulated for use as both taping and topping compound.

#### 2.6 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.
- B. Spot Grout: ASTM C 475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.
- C. Gypsum Board Screws: ASTM C 1002
- D. Asphalt Felt: ASTM D 226, Type I (No. 15)
- E. Concealed Acoustical Sealant: Nondrying, nonhardening, nonskinning, nonstaining, nonbleeding, gunnable sealant complying with requirement specified in Division 7 section "Joint Sealers".

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing required to support ceiling.
1. Furnish concrete inserts and other devices indicated, to other trades for installation well in advance of time needed for coordination with other construction.

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#### 3.3 INSTALLATION OF STEEL FRAMING, GENERAL

- A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer, or if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.
- C. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below:
  - 1. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.
  - 2. Where partition and wall framing abuts overhead structure.
- D. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members.

#### 3.4 INSTALLATION OF STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

- A. Secure hangers to structural support by connecting directly to structure where possible.
- B. Do not connect or suspend steel framing from ducts, pipes or conduit.
- C. Keep hangers and braces 2 inches clear of ducts, pipes and conduits.
- D. Sway-brace suspended steel framing with hangers used for support.
- E. Install suspended steel framing components in sizes and at spacings indicated but not less than that required by referenced steel framing installation standard.
  - 1. Wire Hangers: 0.1620 inch diameter (8 gage), 4 ft. on center
  - 2. Carrying Channels (Main Runners): 1-1/2 inch, 4 ft. on center
  - 3. Rigid Furring Channels (Furring Members): 16 inches on center
- F. Installation Tolerances: Install steel framing components for suspended ceiling so that cross furring members or grid suspension members are level to within 1/8 inch in 12 ft. as measured both lengthwise on each member and transversely between parallel members.
- G. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

#### 3.5 APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standard: Install and finish gypsum board to comply with ASTM C 840.
- B. Install sound attenuation blankets where indicated, prior to gypsum board unless readily installed after board has been installed.
- C. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less

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- than 24 inches in alternate courses of board.
- D. Install ceiling boards across framing in the manner which minimizes the number of end-butt joints, which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.
  - E. Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.
  - F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
  - G. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
  - H. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.
  - I. Attach gypsum board to supplementary framing and blocking provides for additional support at openings and cutouts.
  - J. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32 inches wide. Apply spot grout at each jamb anchor clip just before inserting board into frame.
  - K. Form control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories.
  - L. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.
    - 1. Except where concealed application is indicated or required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq ft area, and may be limited to not less than 75 percent of full coverage.
    - 2. Fit gypsum board around ducts, pipes, and conduits.
    - 3. Where partitions intersect open concrete coffer, cut gypsum board to fit profile of coffer and allow 1/4 to 1/2 inch wide joint for sealant.
  - M. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.
  - N. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

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#### 3.6 METHODS OF GYPSUM BOARD APPLICATION

- A. Single-Layer Application: Install gypsum wallboard as follows:
  - 1. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
  - 2. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
- B. Wall Tile Base: Where drywall is base for thin-set ceramic tile and similar rigid applied wall finishes, install gypsum backing board.
  - 1. In "dry" areas install gypsum backing board or wallboard with tapered edges taped and finished to produce a flat surface.
  - 2. At tubs, toilets, janitor closets, and similar "wet" areas, install water-resistant gypsum backing board to comply with ASTM C 840 and recommendations of gypsum board manufacturer.
  - 3. At showers, tubs and similar "wet areas" install glass mesh mortar units and treat joints to comply with manufacturer's recommendations for type of application indicated.
- C. Double-Layer Application: Install gypsum backing board for base layer and gypsum wallboard for face layer.
  - 1. On partitions/walls apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 10 inches with base layer joints.
- D. Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:
  - 1. Fasten with screws.
- E. Double-Layer Fastening Methods: Apply base layer of gypsum board and face layer to base layer as follows:
  - 1. Fasten both base layers and face layers separately to supports with screws.

#### 3.7 INSTALLATION OF DRYWALL TRIM ACCESSORIES

- A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.
- B. Install corner beads at external corners.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where "U" bead (semi-finishing type) is indicated.
  - 1. Install "LC" bead where drywall construction is tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

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- 2. Install "LK" bead where substrate is kerfed to receive long flange of trim.
  - 3. Install "L" bead where edge trim can only be installed after gypsum board is installed.
  - 4. Install U-Type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
- D. Install control joints at locations indicated, or if not indicated, at spacing and locations required by referenced gypsum board application and finish standard, and approved by the Architect for visual effect.

#### 3.8 FINISH OF DRYWALL

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.
- B. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.
- C. Apply joint tapes at joints between gypsum boards, except where trim accessories are indicated.
- D. Finish interior gypsum wallboard by applying the following joint compounds in 3 coats (not including prefill of openings in base), and sand between coats and after last coat:
  - 1. Embedding and First Coat: Ready-mix drying-type all-purpose or taping compound.
  - 2. Fill (Second) Coat: Ready-mix drying-type all-purpose or topping compound.
  - 3. Finish (Third) Coat: Ready-mix drying-type all -purpose or topping compound.
- E. Water-Resistant Backing Board Base for Ceramic Tile: Finish joints between water-resistant backing board with tape and setting-type joint compound to comply with gypsum board manufacturer's recommendations.
- F. Partial finishing: Omit third coat and sanding on concealed drywall construction which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

#### 3.9 PROTECTION

- A. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION

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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Glazed tile.
  - 2. Natural Floor Tile – floors.
  - 3. Waterproof membrane for **thin-set** tile installations.
  - 4. Crack-suppression membrane for thin-set tile installations.
  - 5. Cementitious backer units installed as part of tile installations.

**1.3 DEFINITIONS**

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Actual tile size (minor facial dimension as measured per ASTM C 499).
- C. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
  - 1. Full-size units of each type and composition of tile and for each color and finish required.
  - 2. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least **12 inches (300 mm)** square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
  - 3. Full-size units of each type of trim and accessory **for each color and finish required.**

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- 4. Stone thresholds in **6-inch (150-mm)** lengths.
  - 5. Metal edge strips in **6-inch (150-mm)** lengths.
  - E. Product Certificates: For each type of product, signed by product manufacturer.
  - F. Qualification Data: For Installer.
  - G. Material Test Reports: For each tile-setting and -grouting product **and special-purpose tile**.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store **liquid latexes and emulsion adhesives** in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

**1.7 EXTRA MATERIALS**

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: **Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated]**

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

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



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2. Products: Subject to compliance with requirements, provide one of the products specified.
  3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
  5. Basis-of-Design Product: The design for each tile type is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

## 2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
  1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
  2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Colors, Textures, and Patterns: Architect to select from Manufacturer's full range of colors for any series specified. Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
  1. **BATHROOMS –Shower Floor only to receive certarnic tile.** Provide Daltile "Sandalo" Castilliam Gray SW92 6 x 6 tiles and trim as needed.
- D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
  1. Where tile is indicated for installation **in wet areas**, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

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- F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

**2.3 TILE PRODUCTS**

**A. Manufacturers:**

1. American Marazzi Tile, Inc.
2. American Olean; Div. of Dal-Tile International Corp.
3. Buchtal Corporation USA.
4. Cerim-Floor Gres Ceramiche.
5. Crossville Ceramics Company, L.P.
6. Daltile; Div. of Dal-Tile International Inc.
7. Florida Tile Industries, Inc.
8. GranitiFiandre.
9. Interceramic.
10. KPT, Inc.
11. Laufen USA.
12. Lone Star Ceramics Company.
13. Metropolitan Ceramics.
14. Monarch Tile, Inc.
15. Porcelanite, Inc.
16. Quarry Tile Company.
17. Seneca Tiles, Inc.
18. Summitville Tiles, Inc.
19. United States Ceramic Tile Company.
20. Winburn Tile Manufacturing Company.

- B. Accessories for Glazed Wall Tile: Provide vitreous china accessories of type and size indicated, in color and finish to match adjoining wall tile, and intended for installing by same method as adjoining wall tile.

**2.4 THRESHOLDS**

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
1. Bevel edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Limit height of bevel to **1/2 inch (12.7 mm)** or less, and finish bevel to match face of threshold.
- B. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of **12** per ASTM C 1353 or ASTM C 241 and with honed finish.

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1. Description: Uniform, fine- to medium-grained white stone with gray veining.

**2.5 SETTING AND GROUTING MATERIALS**

**A. Manufacturers:**

1. Atlas Minerals & Chemicals, Inc.
2. Boiardi Products Corporation.
3. Bonsal, W. R., Company.
4. Bostik.
5. C-Cure.
6. Custom Building Products.
7. DAP, Inc.
8. Jamo Inc.
9. LATICRETE International Inc.
10. MAPEI Corporation.
11. Southern Grouts & Mortars, Inc.
12. Summitville Tiles, Inc.
13. TEC Specialty Products Inc.

**B. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.**

1. For wall applications, provide nonsagging mortar that complies with Paragraph C-4.6.1 in addition to the other requirements in ANSI A118.1.

**C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:**

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
2. Prepackaged dry-mortar mix combined with **acrylic resin or styrene-butadiene-rubber** liquid-latex additive.
  - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.

**2.7 CEMENTITIOUS BACKER UNITS**

- A.** Provide cementitious backer units complying with ANSI A118.9 in maximum lengths available to minimize end-to-end butt joints.

**2.8 MIXING MORTARS AND GROUT**

- A.** Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

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- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
  - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
  - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with **adhesives or thin-set mortar** that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
  - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
  - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package

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show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

**3.3 INSTALLATION, GENERAL**

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

**3.4 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION**

- A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
- B. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
- C. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

**3.5 FLOOR TILE INSTALLATION**

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.
1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
    - a. Exterior tile floors.
    - b. Tile floors in wet areas.
    - c. Tile swimming pool decks.
    - d. Tile floors in laundries.
    - e. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
    - f. Tile floors composed of rib-backed tiles.
- B. Joint Widths: Install tile on floors with the following joint widths:
1. Ceramic Mosaic Tile: 1/16 inch (1.6 mm).

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2. Quarry Tile: **3/8 inch (9.5 mm)**.
3. Paver Tile: **3/8 inch (9.5 mm)**.

C. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.

1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.

CI. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

CII. Grout Sealer: Apply grout sealer to **cementitious** grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

### 3.6 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

B. Install metal lath and scratch coat for walls to comply with ANSI A108.1A, Section 4.1.

C. Joint Widths: Install tile on walls with the following joint widths:

1. Ceramic Mosaic Tile: **1/16 inch (1.6 mm)**.
2. Glazed Wall Tile: **1/16 inch (1.6 mm)**.
3. Quarry Tile: **3/8 inch (9.5 mm)**.

### 3.7 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove **epoxy and latex-portland cement** grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

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- 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 093013

**SECTION 09 65 19**  
**RESILIENT FLOORING**

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 DESCRIPTION OF WORK**

- A. Extent of resilient flooring and accessories is shown on drawings and in schedules. Products will include 6" Rubber base; Luxury Vinyl Tile, and any other accessories/products.

**1.3 QUALITY ASSURANCE**

- A. Manufacturer: Provide each type of resilient flooring and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
- B. Fire Test Performance: Provide resilient flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.
1. Critical Radiant Flux (CRF): Not less than the following rating per ASTM E 648.
    - a. 0.45 watts per sq cm
  2. Flame Spread: Not more than 25 per ASTM E 84
  3. Smoke Developed: Not more than 450 per ASTM E 84
  4. Smoke Density: Not more than 450 per ASTM E 662
- C. Installer's Qualifications: Engage Installer who is certified in writing by resilient flooring manufacturer as qualified for installation of sheet vinyl employing heat welded seams.

**1.4 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of resilient flooring and accessory.
- B. Samples for Initial Selection Purposes: Submit manufacturer's standard color charts in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient flooring required.
- C. Samples for Verification Purposes: Submit the following samples of each type, color and pattern of resilient flooring required, showing full-range of color and pattern variations.
1. Full-size tile samples
  2. 6" x 9" samples of sheet flooring
  3. 2-1/2" long samples of resilient flooring accessories
  4. Welding beads for sheet flooring
  5. Other materials as required
- D. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient flooring complies with fire test performance requirements.
- E. Maintenance Instructions: Submit 2 copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

**1.5 PROJECT CONDITIONS**

- A. Maintain minimum temperature of 65 degrees F (18 deg C) in spaces to receive resilient flooring for at least 48 hours prior to installation, and for not less than 48 hours after installation. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation.



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**RESILIENT FLOORING**

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Subsequently, maintain minimum temperature of 55 deg F (13 deg C) in areas where work is completed.

- B. Install resilient flooring and accessories after other finishing operations, including painting, have been completed. Do not install resilient flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.

**PART 2 - PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Subject to compliance with requirements, provide products of the following:
1. Manufacturers of Vinyl Luxury Tile:
    - a. Roppe Northern Timbers or equal vinyl wood plank flooring collections. Colors to be selected from full range of colors.
  2. Manufacturers of 6" Rubber Wall Base (base to be Roppe 700 series 6" or equal) :
    - a. Burke Flooring Products Div., Burke Industries, Inc.
    - b. Flexco Div., Textile Rubber Co.
    - c. Roppe Rubber Corp.
    - d. Azrock.

**2.2 RESILIENT FLOORING COLORS AND PATTERNS**

- A. Provide colors and patterns as indicated, or if not otherwise indicated, as selected by Architect from manufacturer's standards.

**2.3 LUXURY VINYL FLOOR TILE**

- A. Manufacturer: Roppe Corporation or equal
1. Description: Solid Vinyl Floor Tile meeting the requirements of ASTM F 1700.
  2. Resistance to Chemicals per ASTM F 925: Pass (List of chemicals provided by manufacturer on request)
  3. Light Stability per ASTM F 1515: Pass.(Delta E < 8.00)
  4. Abrasion resistance per ASTM D 3389: Excellent (<0.15 weight loss after 1,000 cycles using H-18 wheels with 500 gram load applied )
  5. Design and Color: As selected by Architect from manufacturer's standard designs and colors.
  6. Does do not contain any of the hazardous chemicals listed in California Proposition 65
  7. Collaborative for High Performance Schools 01350 Low-Emitting Material Criteria: Pass
- B. Roppe Solid Vinyl Floor Tile (or equal)
1. Northern Parallels Premium vinyl plank and type. Allow for FOUR SEPARATE FLOORING SELCTIONS selected from all available pattern options (stone, desert, chevron, mini wood travertine, or coastal) and from all available colors in each pattern group.
    - a. Classification: ASTM F 1700, Class III, Type A.
    - b. Thickness: 28 mil
    - c. Wear Layer Thickness: exceeds ASTM F 1700, Commercial Use.

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2.4 NOT USED

2.5 **ACCESSORIES**

- A. Rubber Wall Base: Provide Roppe or equal Contours profiled base with matching end stops and preformed or molded corner units, and as follows:
  - 1. Height: 6"
  - 2. Finish: Matte
- B. Adhesives (Cements): Waterproof, stabilized type as recommended by flooring manufacturer to suit material and substrate conditions.
- C. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- D. Leveling and Patching Compounds: Latex type as recommended by flooring manufacturer.

**PART 3 - EXECUTION**

3.1 **INSPECTION**

- A. Require Installer to inspect subfloor surfaces to determine that they are satisfactory. A satisfactory subfloor surface is defined as one that is smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance.
- B. Perform bond and moisture tests on concrete subfloors to determine if surfaces are sufficiently cured and dry as well as to ascertain presence of curing compounds.
- C. Do not allow resilient flooring work to proceed until subfloor surfaces are satisfactory.

3.2 **PREPARATION**

- A. Prepare subfloor surfaces as follows:
  - 1. Use leveling and patching compounds as recommended by resilient flooring manufacturer for filling small cracks, holes and depressions in subfloors.
  - 2. Remove coatings from subfloor surfaces that would prevent adhesive bond, including curing compounds incompatible with resilient flooring adhesives, paint, oils, waxes and sealers.
- B. Broom clean or vacuum surfaces to be covered, and inspect subfloor.
- C. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

3.3 **INSTALLATION, GENERAL**

- A. Where movable partitions are shown, install resilient flooring before partitions are erected.
- B. Install resilient flooring using method indicated in strict compliance with manufacturer's printed instructions. Extend resilient flooring into toe spaces, door reveals, and into closets and similar openings.
- C. Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions.
- D. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.
- E. Install resilient flooring on covers for telephone and electrical ducts, and other such items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed in these covers. Tightly cement edges to perimeter of floor around covers and to covers.
- F. Tightly cement resilient flooring to subbase without open cracks, voids, raising and puckering at joints,

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telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

**3.4 INSTALLATION OF TILE FLOORS**

- A. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.
- B. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged if so numbered. Cut tile neatly around all fixtures. Broken, cracked, chipped or deformed tile are not acceptable.
  - 1. Lay tile with grain running in alternating directions.
- C. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

**3.5 INSTALLATION OF SHEET FLOORING**

- A. Lay sheet flooring to provide as few seams as possible with economical use of materials. Match edges for color shading and pattern at seams in compliance with manufacturer's recommendations.
- B. Adhere sheet flooring to substrates using method approved by flooring manufacturer for type of sheet flooring and substrates condition indicated:
  - 1. Use conventional full spread adhesive method for filled vinyl without backing.
- C. Prepare seams in vinyl sheet flooring with manufacturer's special routing tool and heat weld with vinyl thread in accordance with manufacturer's instructions.
- D. Provide integral flash cove base where shown on drawings, including cove support strip and metal top edge strip. Construct coved base in accordance with manufacturer's instructions.

**3.6 INSTALLATION OF ACCESSORIES**

- A. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
- B. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at edges of flooring which would otherwise be exposed.
- C. Apply resilient accessories at stair as indicated and in strict accordance with manufacturer's installation instructions.

**3.7 CLEANING AND PROTECTION**

- A. Perform following operations immediately upon completion of resilient flooring:
  - 1. Sweep or vacuum floor thoroughly
  - 2. Do not wash floor until time period recommended by resilient flooring manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive
  - 3. Damp-mop floor being careful to remove black marks and excessive soil
  - 4. Remove any excess adhesive or other surface blemishes, using appropriate cleaner recommended by resilient flooring manufacturer.
- B. Protect flooring against damage during construction period to comply with resilient flooring manufacturer's directions.
  - 1. Protect resilient flooring against damage from rolling loads for initial period following installation by covering with plywood or hardboard. Use dollies to move stationary

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- equipment or furnishings across floors.
    - 2. Cover resilient flooring with undyed, untreated building paper until inspection for substantial completion.
  - C. Clean resilient flooring not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Clean resilient flooring by method recommended by resilient flooring manufacturer.
- 3.8 **EXTRA STOCK**
- A. Deliver stock of maintenance materials to Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
    - 1. Tile Flooring: Furnish not less than one box for each 50 boxes or fraction thereof, for each type, color, pattern, and size installed.
    - 2. Sheet Flooring: Furnish not less than 5 linear yards for each type, color and pattern installed.

**END OF SECTION**

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## STONCLAD GS/STONKOTE GS4 GUIDE SPEC

### 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. This Section includes one resinous flooring system, one with epoxy body.
  - 1. Application Method: Metal, power or hand troweled. **NOTE STON-HARD MATERIAL TO EXTEND UP ALL WALLS A MINIMUM DIMENSION OF EIGHT INCHES (8") AND HAVE A TERMINATION BAR.**
  - 2. **Provide Stonhard in Grooming 101, Quarantine 114, Puppies 117, Hallway 118, Kennels 119, Hallway 122,**

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Verification: For each resinous flooring system required, 6 inches (150 mm) square, applied to a rigid backing by Installer for this Project.
- C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.
- D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- E. Maintenance Data: For resinous flooring to include in maintenance manuals.

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1.4 QUALITY ASSURANCE

- A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. epoxy mortar based system). Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.
- B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
  - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
  - 2. Contractor shall have completed at least 10 projects of similar size and complexity.
- C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
  - 1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.
- E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Architect.
    - a. Include 48-inch (1200-mm) length of integral cove base.

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2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Pre-installation Conference:

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
2. Attendance:
  - a. General Contractor
  - b. Architect/Owner's Representative.
  - c. Manufacturer/Installer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.
- C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- C. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

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1.7      WARRANTY

- A.      Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 - PRODUCTS

2.1      RESINOUS FLOORING

- A.      Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include,
  - 1.      Build of Broadcast or liquid rich type systems will not be accepted, and will result in a disqualification from bid.
- B.      Acceptable Manufactures,
  - 1.      Stonhard Basis of design. Approved equal is acceptable.
- C.      Products: Subject to compliance with requirements:
  - 1.      Stonhard, Inc.; Stonclad GS®. With top coat Stonkote GS4.
- D.      System Characteristics:
  - 1.      Color and Pattern: Choose from Mfg. Standards
  - 2.      Wearing Surface: Standard smooth.
  - 3.      Integral Cove Base: TBD inches.
  - 4.      Overall System Thickness: nominal 1/4"
- E.      System Components: Manufacturer's standard components that are compatible with each other and as follows:
  - 1.      Primer:
    - a.      Material Basis: Stonhard Standard Primer
    - b.      Resin: Epoxy
    - c.      Formulation Description: (2) two component, 100 percent solids.



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- d. Application Method: Squeegee and roller.
    - e. Number of Coats: (1) one.
  - 2. Mortar Base:
    - a. Material design basis: Stonclad GS
    - b. Resin: Epoxy.
    - c. Formulation Description: (3) three component, 100 percent solids.
    - d. Application Method: Metal Trowel.
      - 1) Thickness of Coats: nominal 1/4 inch (6.4 mm).
      - 2) Number of Coats: One.
    - e. Aggregates: Pigmented Blended aggregate.
  - 3. Top Coat:
    - a. Material design basis: Stonkote GS4
    - b. Resin: Epoxy.
    - c. Formulation Description: (2) two component 100 percent solids.
    - d. Type: pigmented.
    - e. Finish: standard.
    - f. Number of Coats: one.
- F. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
- 1. Compressive Strength: 10,000 psi after 7 days per ASTM C 579.
  - 2. Tensile Strength: 1,750 psi per ASTM C 307.
  - 3. Flexural Strength: 4,000 psi per ASTM C 580.
  - 4. Water Absorption: < 1% per ASTM C 413.
  - 5. Impact Resistance: > 160 in. lbs. per ASTM D 2794.
  - 6. Flammability: Class 1 per ASTM E-648.
  - 7. Hardness: 85 to 90, Shore D per ASTM D 2240.

2.2 ACCESSORY MATERIALS

- A. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

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PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
  - 1. Mechanically prepare substrates as follows:
    - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    - b. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.
  - 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
  - 3. Verify that concrete substrates are dry.
    - a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 75 percent.
    - b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. of slab in 24 hours.
    - c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.
  - 4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

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- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
  - E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

### 3.2 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
  - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
  - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
  - 3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
    - a. Apply joint sealant to comply with manufacturer's written recommendations.
- B. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.
- C. Integral Cove Base: Stonclad GS mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.
  - 1. Integral Cove Base: 10" inches high.
- D. Apply metal trowel single mortar coat in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When cured, sand to remove trowel marks and roughness.
- E. Apply topcoat(s) in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

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3.3 TERMINATIONS

- A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.
- B. Penetration Treatment: Lap and seal resinous system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
- C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.
- D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.4 JOINTS AND CRACKS

- A. Treat control joints to bridge potential cracks and to maintain monolithic protection.
- B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
- C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.5 FIELD QUALITY CONTROL

- A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.
  - 1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
  - 2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
  - 3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with

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unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTING, AND CURING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 18 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 09 77 20  
FIBERGLASS REINFORCED PANELS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished [gypsum] [cementitious] [untreated plywood] wallboard.
  - 1. PVC trim.
- B. Products Not Furnished or Installed under This Section:
  - 1. Gypsum [Cementitious] substrate board.
  - 2. Resilient Base.

1.2 REFERENCES

- A. American Society for Testing and Materials: Standard Specifications (ASTM)
  - 1. ASTM D 256 - Izod Impact Strengths (ft #/in)
  - 2. ASTM D 570 - Water Absorption (%)
  - 3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
  - 4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
  - 5. ASTM D 2583- Barcol Hardness
  - 6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
  - 7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.

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FIBERGLASS REINFORCED PANELS

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- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
  - D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
    - 1. Submit complete with specified applied finish.
    - 2. For selected patterns show complete pattern repeat.
    - 3. Exposed Molding and Trim: Provide samples of each type, finish, and color.
  - E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site (available as downloads for most Marlite's products at <http://www.marlite.com/tech-details.aspx> or by contacting Marlite at [info@marlite.com](mailto:info@marlite.com)).

1.4 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
  - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
    - a. Wall Required Rating – Class [A] [C].
- B. Sanitary Standards: System components and finishes to comply with:
  - 1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
  - 2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.
  - 3. Canadian Food Inspection Agency (CFIA) requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (70°) for 48 hours prior to installation.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work
- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.

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1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

1.7 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Marlite; 202 Harger Street, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com [www.marlite.com](http://www.marlite.com).
- B. Equals are accepted.
- C. Product:
  1. Standard FRP

2.2 PANELS

- A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
  1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
  2. Dimensions:
    - a. Thickness – 0.090 “ (2.29mm) nominal
    - b. Width - 4'-0” (1.22m) nominal
    - c. Length – [10'-0” (3.0m)][8'-0” (2.4m) ][As indicated on the drawings] nominal
  3. Tolerance:
    - a. Length and Width: +/-1/8 “ (3.175mm)
    - b. Square - Not to exceed 1/8 “ for 8 foot (2.4m) panels or 5/32 “ (3.96mm) for 10 foot (2.4m) panels
- B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
  1. Flexural Strength -  $1.0 \times 10^4$  psi per ASTM D 790. (7.0 kilogram-force/square millimeter)
  2. Flexural Modulus -  $3.1 \times 10^5$  psi per ASTM D 790. (217.9 kilogram-force/square millimeter)
  3. Tensile Strength -  $7.0 \times 10^3$  psi per ASTM D 638. (4.9 kilogram-force/square millimeter)
  4. Tensile Modulus -  $1.6 \times 10^5$  psi per ASTM D 638. (112.5 kilogram-force/square millimeter)
  5. Water Absorption - 0.72% per ASTM D 570.



SECTION 09 77 20  
FIBERGLASS REINFORCED PANELS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
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- 
6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
  7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256

- C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.
- D. Front Finish to be selected from Manufacturer's entire color range.

Specifier Note: Marlite's Standard FRP, Induro FRP, Artizan FRP, Envue FRP & Symmetrix with Sani-Coat Panels are available in several configurations, including Class A (I) and Class C (III) Fire-rated, along with various surface textures for both Standard FRP & Symmetrix with Sani-Coat. All Marlite FRP products can be made available with standard surface grooving and customized groove layouts to match architectural specifications.

- a. Color: [Specifier to choose.]
- 1) Marlite Standard FRP is available in a variety of colors, including;
    - a) 100 White
    - b) 106 Beige,
    - c) 118 Natural Almond
    - d) 140 Ivory
    - e) 145 Silver
    - f) 151 Light Grey
    - g) P807 Black
    - h) 199 Bright White
    - i) 7924 Biltmore Cherry
    - j) 7925 Monticello Maple
    - k) 7939 Blonde Echo
- Custom patterns and colors are available. Minimum quantities may apply.  
Contact a Marlite representative for details.

## 2.3 BASE

- A. Provide 1 x 6 solid vinyl base. Prime and paint.

## 2.4 MOLDINGS

- A. PVC Trim: Thin-wall semi-rigid extruded PVC.
1. M 350 Inside Corner,[10' length]
  2. M 360 Outside Corner,[10' length]
  3. M 365 Division,[10' length]
  4. M 370 Edge,[10' length]

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FIBERGLASS REINFORCED PANELS

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- 
- 5. Color: [White][Beige][Natural Almond][Ivory][Silver][Light Grey][Black] To be selected.

B. Outside Corner Guard:

- 1. F 560SS Stainless Corner Guard, 10' length.
- 2. Finish: #4 brushed satin
- 3. M 961 PVC Outside Corner Guard
  - a. Color: Color to be selected, provide 10' length.

2.5 ACCESSORIES

A. Fasteners: Non-staining nylon drive rivets.

- 1. Match panel colors.
- 2. Length to suit project conditions.

B. Adhesive: Either of the following construction adhesives complying with ASTM C 557.

- 1. Marlite C-551 FRP Adhesive - Water- resistant, non-flammable adhesive.
- 2. Marlite C-375 Construction Adhesive - Flexible, water-resistant, solvent based adhesive, formulated for fast, easy application.
- 3. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.

C. Sealant:

- 1. Marlite Brand - Color Match Sealant .

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.

- 1. Verify that stud spacing does not exceed 24" (61cm) on-center.

B. Repair defects prior to installation.

- 1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

SECTION 09 77 20  
FIBERGLASS REINFORCED PANELS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
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3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" (3 mm) clearance for every 8 foot (2.4m) of panel.
  - 1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
  - 2. Pre-drill fastener holes 1/8" (3mm) oversize with high speed drill bit.
    - a. Space at 8" (200mm) maximum on center at perimeter, approximately 1" from panel edge.
    - b. Space at in field in rows 16' (40.64cm) on center, with fasteners spaced at 12" (30.48 cm) maximum on center.
- C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
  - 1. Install panels with manufacturer's recommended gap for panel field and corner joints.
    - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
    - b. Drive fasteners for snug fit. Do not over-tighten.
- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
  - 1. All moldings must provide for a minimum 1/8 " (3mm) of panel expansion at joints and edges, to insure proper installation.
  - 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 097720

## SECTION 09 91 00

### PAINTING

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
  - 1. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color of finish is not designated, the Architect will select from standard colors or finishes available.
- C. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
  - 1. Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

##### 1.3 DEFINITIONS

- A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

##### 1.4 SUBMITTALS

- A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
  - 1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.
- B. Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
  - 1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
  - 2. Submit samples on the following substrates for the Architect's review of color and texture

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### PAINTING

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only:

- a. Interior Walls
- b. Interior Ceilings.

#### 1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  - 1. Notify the Architect of problems anticipated using the materials specified.
- C. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  - 1. Product name or title of material
  - 2. Product description (generic classification or binder type)
  - 3. Federal Specification number, if applicable
  - 4. Manufacturer's stock number and date of manufacture
  - 5. Contents by volume, for pigment and vehicle constituents
  - 6. Thinning instructions
  - 7. Application instructions
  - 8. Color name and number
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

#### 1.7 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

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### PAINTING

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- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
  - C. Do not apply paint in snow, rain, fog, or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5 deg F (3 deg C) above the dew point, or to damp or wet surfaces.
    - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide products of the following:

- 1. Paints: Apply one coat primer and two coats finish to all wall surfaces.

Use top quality of one of the following:

- a. Benjamin Moore Company used as basis of color
    - b. Sherwin Williams
    - c. Devoe

##### 2.2 PRIMERS

- A. Ceilings and Walls to receive epoxy primer and two coats epoxy paint finish.
- B. Exterior materials to receive two coats of latex primer then two coats of latex paint.

##### 2.3 INTERIOR FINISH PAINT MATERIAL

Provide Sherwin Williams or Equal product -

###### CMU — Concrete Masonry Units

Semi-Gloss — High Performance Solvent Based Epoxy Finish (frequently washed and sanitized areas)

Filler: [Kem Cati-Coat® HS Epoxy Filler/Sealer](#), B42-400 Series (number of coats as required to fill voids, pinholes and to provide a proper dense basecoat — confirm with mock up and before application of finish coats)

Finishes: (2) Two Coats of [Macropoxy® 646-100 Fast Cure Epoxy](#), B58-620 (solvent based epoxy)

Cement Board — Walls & Ceilings (frequently washed and sanitized areas)

Semi-Gloss — High Performance Finish Primer: Not Required

Finishes: (2) Two Coats of [Macropoxy® 646-100 Fast Cure Epoxy](#), B58- 620 (solvent based epoxy)\

## SECTION 09 91 00

### PAINTING

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#### ALL DOOR FRAMES, DOORS, HANDRAILS AND MISCELLANEOUS METALS TO RECEIVE:

Ferrous Metal — Doors, Frames, Handrails, and Miscellaneous Metals

Gloss — High Performance Finish

- 1 coat: [Pro Industrial™ Pro-Cryl® Universal Primer](#), B66-310 Series
- 2 coats: [Pro Industrial™ Water Based Catalyzed Epoxy Gloss](#), B73-300 Series

#### GYPSUM BOARD –

Semi-Gloss Finish

- 1 coat: [ProMar® 200 Zero VOC Latex Primer](#), B28W2600
- 2 coats: [Pro Industrial™ Pre-Catalyzed Water Based Epoxy Semi-Gloss](#), K46 Series

FLOORS - General Polymers Trafficote 105 Self Leveling Slurry (provide preparation, primer, binder, and finish coat per manufacturer's recommendations.

#### 2.4 EXTERIOR FINISH PAINT MATERIAL

##### EXTERIOR CMU -

- a. Provide Loxon Block Surfer and primer coats per manufacturer's recommendations for Top coat of ConFlex XL™ Elastomeric High Build Coating— An elastomeric coating that provides excellent flexibility, durability, and weather resistance.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
  1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

#### 3.2 PREPARATION

- A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

## SECTION 09 91 00

### PAINTING

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1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
  1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.
  2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
    - c. When transparent finish is required, backprime with spar varnish.
    - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
  3. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
    - a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
- C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
  1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
  3. Use only thinners approved by the paint manufacturer, and only within recommended limits.



## SECTION 09 91 00

### PAINTING

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#### 3.3 APPLICATIONS

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  - 1. Provide finish coats that are compatible with primers used.
  - 2. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
  - 3. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
  - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
  - 5. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
  - 6. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
  - 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 8. Sand lightly between each succeeding enamel or varnish coat.
  - 9. Omit primer on metal surfaces that have been shop-primed and touch up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss

of adhesion of the undercoat.

- D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended

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### PAINTING

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spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

- E. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

#### 3.4 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

#### 3.5 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
  - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION

SECTION 10 04 03  
CEILING ACCESS PANELS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
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10 04 03-1

## SPEC - DATA

### Glass-Fiber-Reinforced Gypsum/Cement Fabrications

Provide 40" x 84", hinged along length, glass reinforced ceiling access panel with all accessories, latches, hardware and other required elements for a complete, operable installation.



#### 1. Product Name

Glass Reinforced Gypsum (GRG)  
Glass Fiber Reinforced Cement (GFRC):  
t Access Panels

#### 2. Manufacturer

Castle Access Panels & Forms, Inc.  
173 Adesso Dr., Unit 2  
Concord ON L4K 3C3  
CANADA  
(905)738-8089  
Fax: (905)760-9234  
[inquiries@castleaccesspanels.com](mailto:inquiries@castleaccesspanels.com)  
[www.CastleAccessPanles.com](http://www.CastleAccessPanles.com)

#### 3. Product Description

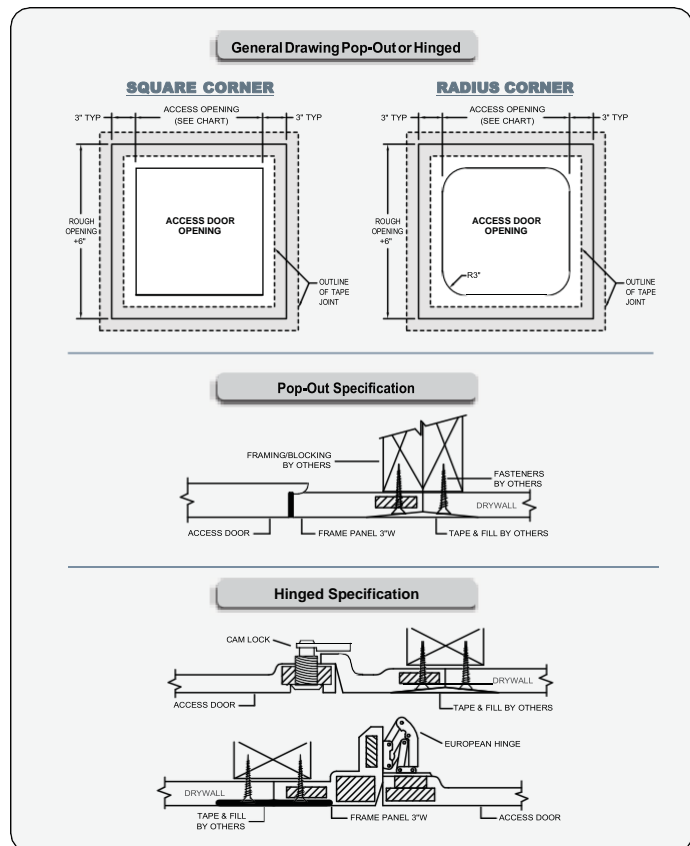
Basic Use: Castle Access Panels & Forms, Inc., manufactures Glass Fiber Reinforced Gypsum (GRG) & Glass Fiber Reinforced Cement (GFRC) products for interior new construction and renovation projects. The GRG product line includes Access Panels, Domes, and Column Cover that replicate the appearance of plaster, but are significantly lighter and more versatile. Castle Access Panels & Forms, Inc. has both standard and custom designs for installation within shopping malls, churches, universities, office buildings, upscale residences and other architectural applications requiring strong, lightweight, flexible and fire retardant elements. GRC is a decorative non-load bearing material and as such the manufacturer cannot be held responsible for structural, load, or seismic considerations.

#### 4. Composition & Materials

Castle Access Panels & Forms, Inc GRG/GFRC products consist of glass-fiber reinforcing and high strength alpha hemi-hydrate gypsum cement (FRG), Potable Water and PORAVER Expanded Glass Granules – Fibrous Glass CAS 65997-17-3 Units will be suitably reinforced with additional materials as required. GRG/GFRC units are supplied primer ready. Finishing is specified elsewhere and shall be applied after GRG/GFRC units are installed. Exposed fasteners shall be stainless steel. All other fastening or attachment devises shall be appropriately plated or galvanized.

#### 5. Seamless Access Panels by Castle Access Panels & Forms, Inc - Custom sizes are available

Hinged Opening Access:  
48 X 84



Access Panels are installed with standard supplies, screws are #6 bugle head, and joints use standard tape joint compound. The panel has an edge thickness to accommodate 5/8" drywall, therefore, shimming may be required if adjacent material is

SECTION 10 04 03  
CEILING ACCESS PANELS

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not 5/8" drywall Framing, Studs or Blocking (by installer) Substrate materials is determined by job-site conditions. The panel does not require regular framing, but can be connected to adjacent drywall using blocks or studs.

**Colors**

GRG/GFRC products are shipped from Castle Access Panels & Forms, Inc. as a natural white gypsum color with a smooth finish. Field finishing is required.

**Benefits**

Weighs less than traditional stone or plaster, simplifying transport and installation

Has a superior fire retardant property - **Class A rated**

Can be cast to a variety of detailed shapes and sizes for increased design flexibility

Easily finished to interior design specifications

Provides a cost-effective, versatile design alternative

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**8. Applicable Standards**

**CERTIFICATION/REFERENCES:**

Except as otherwise additionally indicated on the drawings or specified herein, the standards referred to below, shall apply to work under this section.

.1	ASTM C 473	Nail Pull Resistance
.2	ASTM C 473	Humidified Deflection
.3	ASTM C 947	Elastic Limits
.4	ASTM D 256	Impact Resistance
.5	ASTM D 638	Ultimate Tensile Strength
.6	ASTM D 638	Young's Modulus
7	ASTM D 696	Coefficient of Linear Thermal Expansion
.8	ASTM D 790	Flexural Strength
.9	ASTM D 790	Flexural Modulus
.10	ASTM D 2583	Barcol Hardness
.11	ASTM E 84	Flame Spread Index,
.12	ASTM E 84	Smoke Developed Index

**9. Technical Data**

Manufacturer's product data, including copies of fire test reports.

Shell Thickness - 1/8" to 3/16"

Fastener Test Pull Out (Wood Stud) - 525 lb avg.

Fastener Test Pull Out (Metal Stud) - 215 lb avg.

Fastener Push Through Test - 350 lb avg.

Fuel Contribution (ASTM E84-80) - 0

Flame Spread (ASTM E84-80) - 0

Smoke Index (ASTM E84-80) - 0

Combustion (ASTM E84-80) - Non-Combustible

Class A Non-Rated

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plastic interior panel signs.
  - 1. Room Identification.
  - 2. Restroom.

1.2 RELATED SECTIONS

- A. Gypsum Board Section 092900.

1.3 REFERENCES

- A. ANSI 117.1 - For Buildings and Facilities.
- B. ASTM International (ASTM):
  - 1. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
  - 2. ASTM D 1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
  - 3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 4. ASTM E 2072-04 - Standard Specification for Photoluminescent (Phosphorescent) Safety Marketing.
  - 5. ASTM E2073-02 - Standard Test Method for Photopic Luminance of Photo Luminescent (Phosphorescent) Markings.
- C. Underwriters Laboratories (UL):
  - 1. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
  - 2. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide photopolymer signage that conforms to the requirements of all regulatory agencies holding jurisdiction.
- B. Provide glow in the dark, photo luminescent material that complies with applicable provisions of ASTM E 2073-02 and DIN 67510. Photo luminescent material must have up to eight hours of luminance.
- C. Requirements:
  - 1. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design.
  - 2. Character Proportion: Letters and numbers on signs must have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.
  - 3. Color Contrast: Characters and symbols must contrast with their background - either light characters on a dark background or dark characters on a light background.
  - 4. Raised Characters or Symbols: Letters and numbers on signs must be raised 1/32 in (0.8 mm) minimum and be sans serif characters. Raised characters or symbols must be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm). Symbols or pictograms on signs must be raised 1/32 in (0.8 mm) minimum.

## SECTION 10 14 36

### INTERIOR SIGNAGE

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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5. Symbols of Accessibility: Accessible facilities required to be identified must use the international symbol of accessibility.
6. Braille: Grade II with accompanying text.
- D. Fire Performance Characteristics:
  1. Provide photopolymer signage with surface burning characteristics that consist of a flame spread of 75 and a smoke development of 120 when tested in accordance to UL 723 (ASTM E 84).
  2. Self-Extinguishing: Provide photopolymer signage with a CC1 classification for .060 in thick material when tested in accordance with the procedures in ASTM D 635, Standard Test Method for Rate of Burning and/or Extent and Time of Burning Plastics in a Horizontal Position.
  3. Vertical Burn: Provide photopolymer material that is classified as 94V-2 for material .118 in thick or greater and 94HB for material .118 in thick or less when tested in accordance with UL 94, Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
  4. Self-Ignition Temperature: Provide photopolymer material that has a self-ignition temperature of 800 degrees F (427 degrees C) when tested in accordance with ASTM D 1929.

#### 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittals.
  1. Product Data: Manufacturer's data sheets on each product to be used, including Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- B. Shop Drawings: Detail drawings showing sizes, lettering and graphics, construction details of each type of sign and mounting details with appropriate fasteners for specific project substrates.
- C. Manufacturer's Installation Instructions: Printed installation instructions for each signage system.
- D. Message List: Signage report indicating signage location, text and sign type.
- E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and available pictograms, characters, and Braille indications.
- F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and typical pictograms, characters, and Braille indications.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum two years documented experience in work of this Section.
- B. Installer Qualifications: Minimum two years documented experience in work of this Section.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  1. Furnish signs designated by Architect.

## SECTION 10 14 36

### INTERIOR SIGNAGE

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in unopened factory packaging.
- B. Inspect materials at delivery to verify there are no defects or damage.
- C. Store products in manufacturer's original packaging until ready for installation in climate controlled location away from direct sunlight.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction.

#### 1.8 PROJECT CONDITIONS

- A. Install products in an interior climate controlled environment.
- B. 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: Nova Polymers, Inc., which is located at: 8 Evans St. Suite 201; Fairfield, NJ 07004; Toll Free Tel: 888-484-NOVA (6682); Email:[request info \(info@novapolymers.com\)](mailto:request_info@novapolymers.com); Web:[www.novapolymers.com](http://www.novapolymers.com)
  1. Acceptable Fabricator: Ability Plastics, 8721 Industrial Drive, Justice, Illinois 60458. Phone: (800) 323-2722. Email:[sales@abilityplastics.com](mailto:sales@abilityplastics.com) Web:[www.abilityplastics.com](http://www.abilityplastics.com).
  2. Acceptable Fabricator: Acorn Sign Graphics, PO Box 11664, Richmond, Virginia 23230. Phone: (804) 726-6999. Email:[info@acornsign.com](mailto:info@acornsign.com). Web:[www.acornsign.com](http://www.acornsign.com).
  3. Acceptable Fabricator: Acumen Visual Group, 30 Riviera Drive Markham ON Canada L3R 5M1 Phone: +1 905-947-0770 Web:[www.ideasbuilt.ca](http://www.ideasbuilt.ca).
  4. Acceptable Fabricator: AGS, 302 Commerce Drive, Exton, PA 19341. Phone: (610) 363-8150. Email:[info@agsinfo.com](mailto:info@agsinfo.com). Web:[www.agsinfo.com](http://www.agsinfo.com).
  5. Acceptable Fabricator: Advanced Signing LLC, 4 Industrial Park Road, Medway, MA 02053. Phone: (508) 533-9000 ext. 3026. Email:[gpiper@advancedsigning.com](mailto:gpiper@advancedsigning.com). Web:[www.advancedsigning.com](http://www.advancedsigning.com).
  6. Acceptable Fabricator: APCO Graphics, Inc., 388 Grant St. SE, Atlanta, GA 30312. Phone (800) 215-4039. Web:[www.apcographics.com](http://www.apcographics.com)
  7. Acceptable Fabricator: ASI CT - East Berlin, CT, 100 Clark Dr., East Berlin, CT. Phone: (860) 828-3331. Web:[www.asisignage.com/ASIHartford/tabid/211/Default.aspx](http://www.asisignage.com/ASIHartford/tabid/211/Default.aspx).
  8. Acceptable Fabricator: ASI, Dallas - Dallas, TX, 8181 Jetstar Drive, Suite 110, Irving, TX 75063. Phone: (972) 915-3800. Web:[www.asisignage.com/ASIDallas/tabid/243/Default.aspx](http://www.asisignage.com/ASIDallas/tabid/243/Default.aspx).
  9. Acceptable Fabricator: ASI, Iowa - Grinnell, IA, 1219 Zimmerman Dr., Grinnell, IA 50112. Phone: (641) 236-6616. Web:[www.asisignage.com/ASIIowa/tabid/239/Default.aspx](http://www.asisignage.com/ASIIowa/tabid/239/Default.aspx).
  10. Acceptable Fabricator: ASI, New Orleans, 1101 24th St., Kenner, LA 70062. Phone: (504) 704-1000. Web:[www.asisignage.com/ASINewOrleans/tabid/236/Default.aspx](http://www.asisignage.com/ASINewOrleans/tabid/236/Default.aspx).
  11. Acceptable Fabricator: Bell Company, 106 Morrow Ave., Trussville, AL 35173-0092.



## SECTION 10 14 36

### INTERIOR SIGNAGE

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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- Phone: (800) 828-3564. Email:[sales@bellcoinc.com](mailto:sales@bellcoinc.com). Web:[www.braillebybell.com](http://www.braillebybell.com).
12. Acceptable Fabricator: Boyd Sign Systems, 3901 S Kalamath St, Englewood, CO 80110. Phone: (800) 333-3190. Email:[signs@boydsignsystems.com](mailto:signs@boydsignsystems.com). Web:[www.boydsignsystems.com](http://www.boydsignsystems.com).
  13. Acceptable Fabricator: Cab Signs, 38 Livonia Ave, Brooklyn, NY 11212. Phone: (800) 394-1690. Email:[sales@cab-signs.com](mailto:sales@cab-signs.com). Web:[www.cab-signs.com](http://www.cab-signs.com).
  14. Acceptable Fabricator: Cadwell Signs, 4 Kuniholm Drive, Holliston, MA 01746. Phone: (508) 429-3100. Web:[www.cadwellsigns.com](http://www.cadwellsigns.com).
  15. Acceptable Fabricator: Creative Sign Designs, 12801 Commodity Place, Tampa, FL 33626. Phone: (800) 804-4809. Email:[sales@creativesigndesigns.com](mailto:sales@creativesigndesigns.com). Web:[www.creativesigndesigns.com](http://www.creativesigndesigns.com).
  16. Acceptable Fabricator: Dixie Graphics, 636 Grassmere Park, Nashville TN 37211. Phone: 615-832-7000. Email:[info@dixiegraphics.com](mailto:info@dixiegraphics.com). Web:[www.dixiegraphics.com](http://www.dixiegraphics.com).
  17. Acceptable Fabricator: Eye Candy Signs, 2705 Agricola St, Halifax Nova Scotia, Canada B3k 4C7. Phone: (902) 429-8281. Email:[contact@eyecandysigns.ca](mailto:contact@eyecandysigns.ca). Web:[www.eyecandysigns.ca](http://www.eyecandysigns.ca).
  18. Acceptable Fabricator: Graphic Components, 3125 Spring Garden St, Greensboro, NC 27407. Phone: (336) 542-2128. Email:[vince@graphiccomponents.com](mailto:vince@graphiccomponents.com). Web:[www.graphiccomponents.com](http://www.graphiccomponents.com).
  19. Acceptable Fabricator: GraphTec, Inc., 8411 Rannie Road, Houston, TX 77080. Phone: (713) 690-9999. Email:[blake@graphtecinc.com](mailto:blake@graphtecinc.com). Web:[www.graphtecinc.com](http://www.graphtecinc.com).
  20. Acceptable Fabricator: InPro Corporation, S80 W18766 Apollo Drive, Muskego, WI 53150. Phone: (800) 222-5556. Email:[mbudnik@inprocorp.com](mailto:mbudnik@inprocorp.com). Web:[www.inprocorp.com](http://www.inprocorp.com).
  21. Acceptable Fabricator: JRT Industries, 36 Tanderra Drive, Sharon, QLD 4670 Australia. Phone: (07) 41577003. Email:[info@jrtindustries.com.au](mailto:info@jrtindustries.com.au). Web:[www.jrtindustries.com.au](http://www.jrtindustries.com.au).
  22. Acceptable Fabricator: Kroy Sign Systems, 7575 E Redfield Rd, Suite 113, Scottsdale, AZ 85260. Phone: (800) 950-5769. Email:[signs@kroysignsystems.com](mailto:signs@kroysignsystems.com). Web:[www.kroysignsystems.com](http://www.kroysignsystems.com).
  23. Acceptable Fabricator: The Look Company Middle East, 125 Al Waab Street, Doha, Qatar. Phone: +974 4447 5865. Email:[sales@thelookcompany.com](mailto:sales@thelookcompany.com). Web:[www.thelookcompany.com](http://www.thelookcompany.com).
  24. Acceptable Fabricator: Marvel Sign and Display, Inc., 99 Rodinea Road, Unit 1, Vaughan, Ontario L6A 1R3, Canada. Phone: (905) 856-6920. Email:[alan@marvelsigns.ca](mailto:alan@marvelsigns.ca). Web:[www.marvelsigns.ca](http://www.marvelsigns.ca).
  25. Acceptable Fabricator: Neiman & Company, 6842 Valjean Ave., Van Nuys, CA 91406. Phone: (818) 781-8600. Email:[signs@neimanandco.com](mailto:signs@neimanandco.com). Web:[www.neimanandcompany.com](http://www.neimanandcompany.com).
  26. Acceptable Fabricator: Nova Polymers, 15348 U.S. Rt. 127 EW, Bryan, OH 43506. Phone: (888) 484-6682. Email:[info@novapolymers.com](mailto:info@novapolymers.com). Web:[www.novapolymers.com](http://www.novapolymers.com).
  27. Acceptable Fabricator: Park Place Sign Systems, Inc., 2019 30th Street, Hannibal, MO 63401. Phone: (573) 221-1360. Email:[sales@parkplacesign.com](mailto:sales@parkplacesign.com). Web:[www.parkplacesign.com](http://www.parkplacesign.com).
  28. Acceptable Fabricator: Poblocki Sign Company LLC, 922 S 70th St., Milwaukee, WI 53214. Phone: (414) 453-4010. Web:[www.poblocki.com](http://www.poblocki.com).
  29. Acceptable Fabricator: Sign Pro, 60 Westfield Dr, Plantsville, CT 06479. Phone: (860)229-1812. Email:[pete@signpro-usa.com](mailto:pete@signpro-usa.com). Web:[www.signpro-usa.com](http://www.signpro-usa.com).
  30. Acceptable Fabricator: Spring Moon Signs, 105 Venetian Blvd, St. Augustine, FL 32095. Phone: (888) 526-6205. Email:[smsd1969@gmail.com](mailto:smsd1969@gmail.com). Web:[www.springmoonsigns.com](http://www.springmoonsigns.com).
  31. Acceptable Fabricator: Tube Art Group, 11715 SE 5th Street, Bellevue, WA 98005.



INTERIOR SIGNAGE

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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Phone: (206) 223-1122 Email: [mwoods@tubearth.com](mailto:mwoods@tubearth.com). Web: [www.tubearth.com](http://www.tubearth.com).

32. Acceptable Fabricator: Welch Signs, 7 Lincoln Ave., Scarborough, ME 04074. Phone: (800) 635-3506. Web: [www.welchusa.com](http://www.welchusa.com).

33. Acceptable Fabricator: WSI Sign System Ltd. & KING Architectural Products, 31 Simpson Road, Bolton - Ontario L7E 2R6. Phone: (905) 857-2804. Web: [www.king-ap.com](http://www.king-ap.com).

- B. Substitutions: permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Product Substitutions Section.

2.2 SIGNAGE - GENERAL

- A. It is the intent of these specifications to establish a sign standard for the Owner including but not limited to, wall-mounted directional signs, primary room identification, restrooms, conference rooms and all code compliant Braille signage. All rooms, stairs, restrooms, etc. to have signage. Coordinate names and numbers with Architect.
- B. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design codes that apply to the State and Local jurisdiction of the project.
- C. If required text and graphics are not indicated in specification or on drawings, obtain Owner's instructions as to text and graphics prior to preparation of shop drawings.
- D. Typography: See Drawings. Copy shall be a clean and accurate reproduction of typeface(s) specified. Upper and lower case and all caps as indicated in Sign Type drawings and Signage Schedule. Letter spacing to be set by manufacturer.
- E. Arrows, symbols and pictograms will be provided in style, sizes, colors and spacing as indicated in drawings for each sign system.
- F. Braille:
  - 1. Grade 1 Braille.
- G. Design:
  - 1. Novacryl PT-119 (Sioux Center Community Hospital example on Novacryl's website). Provide Room name and braille, Room number and braille, interchangeable personnel title/name slot, wood accent and decorative accent vertical strip. Provide matching, coordinating signage, with room graphic for rooms such as restrooms, Janitor, etc.

## INTERIOR SIGNAGE

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

10 14 36-6



## 2.3 INTERIOR SIGNAGE

- A. Panel Material: Novacryl PT Series Photopolymer
1. Composition: 0.032 inch (0.8 mm) thick moisture resistant, non-glare interior nylon photopolymer on ultraviolet resistant clear PETG sign base, single piece construction. Laminated photopolymers, added-on characters, and engraved characters are not acceptable.
  2. Sustainable Certification: Minimum 40 percent pre-consumer recycled content.
  3. Base thickness: 0.060 inch (1.5 mm) Non-glare PETG.
  4. Type and Color: To be selected from manufacturer's full color range by Architect.
  5. Size: \_10" x 14" minimum
  6. Surface burning characteristics: Flame spread/smoke developed rating less than 75/120, tested to ASTM E 84 and UL 723.
  7. Rate of burning: Tested to ASTM D 635 at nominal 0.060 inch (1.5 mm) thickness with resulting Classification CC1.
  8. Vertical burning: Tested to UL 94, classified as 94V-2 in thickness of 0.118 inch (3.0 mm) or greater and 94HB in thicknesses less than 0.118 inch (3.0 mm).
  9. Self-ignition temperature: 800 degrees F (427 degrees C), tested to ASTM D 1929.

**Provide exterior Building lettering** that says "FAYETTE COUNTY ANIMAL SHELTER" on the front of the building. Lettering to be Gemini laser cut acrylic with 16" high letters with 1 ½" thickness.. Color to be selected from manufacturer's full range of colors.

2.4 ACCESSORIES

- A. Adhesive:
  - 1. Type recommended by sign manufacturer.
  - 2. Maximum volatile organic compound (VOC) content: 70 grams per liter.
- B. Tape: Double sided, waterproof, pressure sensitive.
- C. Fasteners: Chrome plated screws.
- D. Fasteners: Brass screws.
- E. Fasteners: Stainless steel screws.

2.5 FABRICATION

- A. Fabricate panel material in accordance with manufacturer's instructions and approved shop drawings.
- B. Fabricate signs by photo polymer process using film negatives to produce characters and graphics in contrasting color, raised. Refer to Signage Schedule.
- C. Characters:
  - 1. Height: Refer to Signage Schedule.
  - 2. Style: Refer to Signage Schedule.
  - 3. Width to height ratio: Refer to Signage Schedule.
  - 4. Stroke width to height ratio: Refer to Signage Schedule.
- D. Pictograms: Refer to Signage Schedule.
- E. Provide Braille Grade indications for each character.
- F. Frames:
  - 1. Miter corners; fit to hairline joint.
  - 2. Secure frame to sign with adhesive.
- G. Changeable Slide Inserts: Clear PETG sheet cover with slot behind for insertion of changeable slide strip, removed from side.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

**SECTION 10 14 36**  
**INTERIOR SIGNAGE**

**CARTER WATKINS ASSOCIATES ARCHITECTS, INC.**

**10 14 36-8**

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**3.3 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.

**3.4 PROTECTION**

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

END OF SECTION



SECTION 10 51 00  
LOCKERS

105100-1

CARTER WATKINS ASSOCIATES ARCHITECT, INC.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Lockers of the following types:
  - 1. Standard duty metal lockers, Traditional Collection. Provide 4 (12" wide, double tier) locker units in staff bathroom. (8 lockers total) Each locker to be 18" wide x 18" deep.
  - 2. Locker accessories.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Concrete Work.
- B. Section 06 10 00 - Rough Carpentry.

1.3 REFERENCES

- A. ADAAG - American with Disabilities Act, Accessibility Guidelines.
- B. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- C. ASTM International (ASTM):
  - 1. ASTM A 1008 - Standard Specification for Steel Sheet, Carbon, Cold-Rolled, Commercial Quality.
  - 2. ASTM D 4976 - Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
  - 3. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00 - Submittals.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Provide layout and elevations of lockers with overall dimensions.
- D. LEED Requirements: Provide products required by this section with attributes that contribute to the project sustainability goals:
  - 1. MR 4.1 and MR 4.2: Recycled Content.
  - 2. EQ 4.1, EQ 4.2, EQ 4.4: Low Emitting Materials.
- E. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms.

- F. Verification Samples: For finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product and color selected.

## 1.5 QUALITY ASSURANCE

- A. Provide all lockers from a single manufacturer.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspect lockers upon receipt for visible damage. Further inspection if necessary for hidden damage.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Sequence deliveries to avoid project delays, but minimize on-site storage.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: ASI Storage Solutions, which is located at: 900 Clary Connector; Eastanollee, GA 30538; Tel: 706-827-2720; Fax: 706-827-2710; Email: [request info \(info@asi-storage.com\)](mailto:info@asi-storage.com); Web: <http://asi-storage.com>
- B. Substitutions: Equals permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

### 2.2 MATERIALS

- A. Steel: Prime grade mild cold-rolled sheet steel free from surface imperfection, capable of taking a powder coating finish.
  - 1. Hooks: Zinc plated forged steel, ball ends.
  - 2. Bolts and Nuts: Zinc plated truss fin head bolts, hex nuts.
  - 3. Rivets.

### 2.3 STANDARD DUTY METAL LOCKERS

- A. Standard Duty Metal Lockers:
  - 1. Acceptable Product: ASI Storage Solutions Tradition Collection.
  - 2. Type of Lockers: Welded.
  - 3. All Heights shown with 6 inch (152 mm) legs.
  - 4. Double Tier:
    - a. Size: Assembled 18 inches wide by 18 inches deep with closed base and sloped top. Provide four (4) of each unit (double tier unit). Color to be selected from full range.
  - 5. Material: Steel parts shall be mild cold rolled commercial quality steel, ASTM A1008.
  - 6. Finish: Steel surfaces shall be power washed, phosphate treated and finished with an electrostatically applied 2 mm thick hybrid epoxy/polyester powder coating and baked.
  - 7. Construction: Lockers shall be built on a unitized principle with common intermediate uprights separating units.
  - 8. Door Frames: 16 gauge formed in a channel shape. Vertical members shall have additional flange to provide a continuous door strike. Cross frame members; 16 gauge channel shaped.
    - a. Triple Tier Lockers: Include intermediate cross frames.
  - 9. Doors: Knocked Down: 16 gauge with louvers, channel shaped on both the lock and hinge side, with angle formations across the top and bottom.
  - 10. Doors: Welded: 14 gauge with louvers, channel shaped on both the lock and hinge side, with angle formations across the top and bottom.
  - 11. Body:

- a. Bottoms: 16 gauge.
- b. Tops, Sides and Shelves, Knocked Down: 24 gauge.
- c. Tops, Sides and Shelves, Welded: 16 gauge.
- d. Backs: 18 gauge.
- e. Bolt spacing shall not exceed 9 inches (228 mm) o.c.
- 12. Hinges: Full length 16 gauge continuous piano type, riveted to both door and frame.
- 13. Handles: One-piece 20 gauge deep drawn stainless steel cup designed to accommodate locks.
- 14. Latching: 1-3 Tiers Lifting trigger 14 gauge steel, attached to the latching channel. Doors to have Digilock Range Electronic Keypad Locker Lock (NLRK-ADO2-619-01P1.. Doors to have latch clip engaging frame at three points on doors over 42 inches (1.067 m) high and two points on all other doors. Locking device to be positive automatic type, whereby locker door may be locked when open, then closed without unlocking.
- 15. Latching: 4,5,6 Tier: An 11 gauge frame hook shall be secured to the frame. The frame shall have a padlock hasp protruding through the recessed handle. A rubber silencer shall be firmly secured to the frame at each latch hook.
- 16. A rubber silencer shall be firmly secured to the frame at each latch hook.
- 17. Interior Equipment:
  - a. Single tier lockers 48 inches (1.219 m) or higher shall have a shelf.
  - b. Single tier lockers less than 18 inches (457 mm) deep shall have three wall hooks and one ceiling hook.
  - c. Single tier lockers 18 (457 mm) inches deep or more shall have a coat rod instead of a ceiling hook.
  - d. Double Tier lockers shall have three wall hooks and one ceiling hook
  - e. Triple Tier lockers shall have three wall hooks for 12 inches (305 mm) wide lockers.
  - f. Triple tier lockers shall have four wall hooks for 15 inches (381 mm) and wider lockers.
- 18. Number Plates: Each locker shall have a polished aluminum number plate riveted to door face with black numerals 1/2 inch (12 mm) high.
- 19. Finish: Doors and exposed body parts shall be finished in a baked on powder coat finish in color indicated.
  - a. Color: BURGUNDY
- 20. Assembly:
  - a. Factory Assembly: All locker components shall be assembled with rivets.
  - b. Knocked Down: All locker components shall be assembled with nuts and bolts.

## 2.4 LOCKER ACCESSORIES

- A. Metal Locker Sloped Tops:
  - 1. Individual sloped tops shall be 24 gauge sheet steel, powder coated to match the color of the lockers. Tops shall be formed to a slope which rises 1/3 of the locker depth.
- B. Metal Locker Bases:
  - 1. Base: Zee base shall be 14 gauge sheet steel, powder coated to match the color of the lockers.
- C. Benches:
  - 1. Provide ten (10) 36" ASI or equal Wood Bench Tops: Wood bench tops shall be fabricated of hardwood with all corners sanded and rounded and finished with two (2) coats of clear lacquer. Provide floor anchored trapezoidal pedestals.
- D. Locks:
  - 1. Built-In Combination Locks: Built-in combination locks shall have five (5) combination changes and be furnished with master keys. Locks shall be furnished with stainless steel escutcheon plates and dead bolts or spring bolts LH or RH reversible.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates and bases have been properly prepared.
- B. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 INSTALLATION

- A. Install lockers and accessories at locations shown in accordance with manufacturer's instructions.
- B. Install lockers level and plumb with flush surfaces and rigid attachment to anchoring surfaces.
- C. Anchor lockers to floor and wall at 48 inches (1.219 m) or less, as recommended by the manufacturer.
- D. Fasten adjoining locker units together to provide rigid installation.
- E. Install sloping tops and metal fillers using concealed fasteners. Provide flush hairline joints against adjacent surfaces.
- F. Install front bases between legs without overlap or exposed fasteners. Provide end bases on exposed ends.
- G. Install benches by fastening bench tops to pedestals and securely anchoring to the floor using appropriate anchors for the floor material.

### 3.3 ADJUSTING AND CLEANING

- A. Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily.
- B. Touch-up factory-finish and repair or replace damaged products before Substantial Completion.

### 3.4 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION



SECTION 12 20 00

WINDOW BLINDS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

12 20 00-1

FAYETTE COUNTY ANIMAL SHELTER

AUGUST 05, 2020

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Bali Window Shades or equal. ALL WINDOWS, (interior and exterior of building) are to receive blinds.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for the Bali Window Blinds.
- C. Samples for verification purposes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide the following:
  - 1. Bali Premium roller shade with cordless lift, clear hem grip, Medium Cassette Valance, and standard hem. Color to be selected.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions applicable to products and application indicated.
- B. Enclosed headrail mounted between gypsum board returns into steel studs.

END OF SECTION

SECTION 13 19 00  
KENNELS AND VETERINARY EQUIPMENT

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

13 19 00-1

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**PART 1 - GENERAL**

**1.1\_ RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following kennel systems for the Animal Services Building:
1. Floor mounted stainless steel kennels.
  2. Veterinary Equipment.

**1.3 SUBMITTALS**

- A. Submit complete Shop Drawings showing all dimensions, colors, quantities, drainage, construction, dimensions, and mounting methods. Verify all as-built dimensions prior to developing Shop Drawings. All color selections to be made from manufacturer's full range of colors.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide the following:
1. REFER TO ITEM "A" ON PLANS – KENNELS ROOM 119  
Mason Company or equal - Thirty-Two (32) Double (back-to-back) kennel system 6 feet high Sani-Kennel (or equal) system on concrete. 3'-8" foot x 6' foot kennels with guillotine doors to 3'-8" x 3'-8" rear kennel. Refer to Floor Plan for layout. Size (custom) as described above with vertical transfer door between compartments. Finish to be stainless steel.  
Kennels to have the following standard and optional items:  
Sliding feed tray  
Standard Gate/Gate Frame (two) each gate to have card holder  
Latch and latch bar  
Bone Counterweights (front and back)  
Drain systems for all kennels leading to building drainage  
Side Panels with 2 foot high stainless steel frame and slotted welded panel at  
Top with stainless steel isolation panels to 4 feet high  
Drain covers (T-shape)  
Enclosed double-pulley operated transfer door operable from either end.  
Each double kennel to have two (2) slots for slide in feed and two (2) slots for slide in water bowls. Adjustable side drop bar to slope with the slope of the floor.  
End Kennels to have removable side walls to allow for 7' x 6' configuration (2total 7' x 6' units).  
Each Kennel to have aluminum frame resting bench on each side.

SECTION 13 19 00  
KENNELS AND VETERINARY EQUIPMENT

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

13 19 00-2

---

All kennels to have welded wire tops to prevent vertical escape.

2. REFER TO ITEM "B" ON PLANS. QUARANTINE KENNELS ROOM 114

Mason Company or equal - Ten (10) sani-kennel system, or equal, 4'-8" deep by 3'-4" wide by 6 feet high system on concrete. Each kennel to be equipped with side-transfer guillotine doors adjacent kennel. Refer to Floor Plan for layout. Size (custom) as described above with vertical transfer door between compartments. Finish to be stainless steel.

Kennels to have the following standard and optional items:

Sliding feed tray

Standard Gate/Gate Frame (two) each gate to have card holder

Latch and latch bar

Bone Counterweights (front and back)

Drain systems for all kennels leading to building drainage

Side Panels with 2 foot high stainless steel frame and slotted welded panel at

Top with stainless steel isolation panels to 4 feet high

Drain covers (T-shape)

Enclosed double-pulley operated transfer door operable from either end.

Each double kennel to have two (2) slots for slide in feed and two (2) slots for slide in water bowls. Adjustable side drop bar to slope with the slope of the floor.

Each Kennel to have aluminum frame resting bench.

All kennels to have welded wire tops to prevent vertical escape.

3. ITEM "C" ON PLANS – REFER TO PLUMBING DRAWINGS – JANITOR ROOM 116

4. ITEM "D" ON PLANS – ADOPTABLE PUPPIES – ROOM 117

Mason Company or Equal – four (4) quantity Model #9 Fiberglass Quiet Cottages with drains. Contractor to coordinate exact kennel drain locations and provide drains from all to the drain provided on plumbing drawings. Provide four (4) quantity of Model #9 - 35 ¾" wide by 6'-6" high (three kennels high).

5. ITEM "E" ON PLANS INTAKE/BONDING ROOM 110 AND ADOPTABLE PUPPIES ROOM 117

Shor-line or equal Fold-up Exam Table 22' x 44" #903.1130.04.

Raised polyethylene grid floors with drains.

6. ITEM "F" ON PLANS – GROOMING ROOM 101

Provide Suburban Surgical Imperial Full-Height Prep-Procedure/Treatment 10'-0" wide (verify as-built dimension) "T" - Shape with the following elements (see marked-up cut sheet):

Laminated butted tops

SECTION 13 19 00  
KENNELS AND VETERINARY EQUIPMENT

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
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13 19 00-3

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Full-width Upper shelving

Center Element (peninsular): Imperial recessed-middle prep-procedure table with three drawers and one right hinged cabinet door. Provide metal grate for over prep table for other procedures. Abut against adjacent full-width cabinets.

Faucet to be Suburban Surgical #024630-F-M-ZZ-S080-A Wrist Action Handle, Swivel Gooseneck, Spout, Angled Sprayer.

Left Side to have Knee Space and three drawers.

Right side to have Stainless Steel Sink and Faucet (13337-00-CPAXBZ) and with four drawers and right-hand cabinet.

7. ITEM "G" ON PLANS - BREAK – ROOM 109 - Dishwasher – supplied by Owner. Complete coordination and installation by General Contractor. Provide cold water and drain.
8. ITEM "H" ON PLANS - LAUNDRY ROOM 122 -Washing Machine – supplied by Owner. Complete coordination and installation by General Contractor. Provide hot and cold water, wall box, and drain.
9. ITEM "J" ON PLANS – LAUNDRY – ROOM 112 - Electric Clothes Dryer– supplied by Owner. Complete coordination and installation by General Contractor. Provide 220 power and exhaust.
10. ITEM "K" ON PLANS –ADOPTABLE CATS – ROOM 103 - Cat Kennels owned by Fayette County. Contractor to relocate from existing and install in new facility.
11. ITEM "L" ON PLANS – CAT ISOLATION – ROOM 111 - Mason Company Cat isolation units two-high, 30 ¼" wide by 6'-9 ½" high. Provide power and drain.
12. ITEM "M" ON PLANS – CAT ISOLATION – ROOM 111 - Mason Company, or equal, Fiberglass Quiet Cottages **without** drain. Provide two (2) quantity of Model #9 - 35 ¾" wide by 6'-6" high (three kennels high).
13. ITEM "N" ON PLANS – KENNELS – ROOM 119 (see plumbing drawings) Just Manufacturing Scullery Sink 14 gauge stainless steel 72" x 27" single-compartment sink with Just Manufacturing JPR-309 Faucet.
14. ITEM "O" ON PLANS – ADOPTABLE CATS 103, BREAK 109, INTAKE/BONDING 110, CAT ISOLATION 111 See plumbing drawings.
15. ITEM "P" ON PLANS – GROOMING – ROOM 101 – OWNER SUPPLIED DOG TUB. Contractor to verify fitting requirements and coordinate with installation in new building. Remove from existing facility and install in new facility.
16. ITEM "Q" ON PLANS - ROOMS 119, (3 QTY.), ROOM 101, ROOM 114, ROOM 117 - Coxreels Stainless Steel wall-mount hose reel. Hand crank ¾ in (F)NPT 100ft.
17. ITEM "R" ON PLANS – GROOMING – ROOM 101 - Suburban Surgical ExceLED exam light. Ceiling mounted with extended pole for 12-foot ceilings. Model # M1000000-061514. Ceiling Rod Model #MI00-1000976-63.
18. ITEM "S" ON PLANS – KENNELS 119 OWNER SUPPLIED Stainless Steel Table. Contractor to

**SECTION 13 19 00**  
**KENNELS AND VETERINARY EQUIPMENT**

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

13 19 00-4

- 
- remove from existing shelter and relocate.
19. ITEM "T" ON PLANS – CAT ISOLATION 111 AND QUARANTINE KENNELS 114 - OWNER SUPPLIED 60" wide by 30" deep freestanding stainless steel sink with drainboard. Contractor to verify fitting requirements and coordinate with installation in new building. Remove from existing facility and install in new facility.
20. ITEM "U" ON PLANS – ADOPTABLE CATS 103 AND ADOPTABLE PUPPIES 117 - OWNER SUPPLIED 48" wide x 30" deep freestanding stainless steel sink with drainboard. Contractor to verify fitting requirements and coordinate with installation in new building. Remove from existing facility and install in new facility.

**PART 3 - EXECUTION**

**3.1 INSTALLATION, GENERAL**

- A. Comply with manufacturer's instructions applicable to products and application indicated. Coordinate all in-concrete slab items with concrete pour. Verify all dimensions, footing requirements, etc. prior to submitting shop drawings for concrete slab/foundation.

**END OF SECTION**

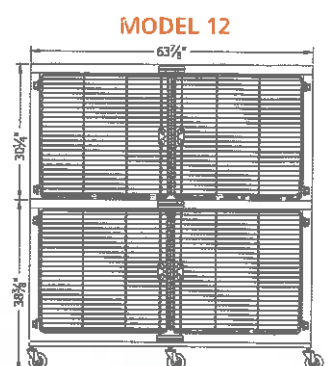
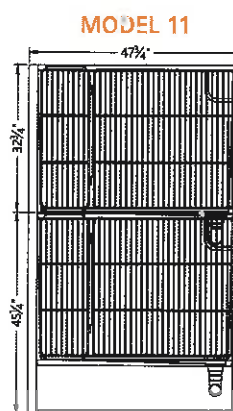
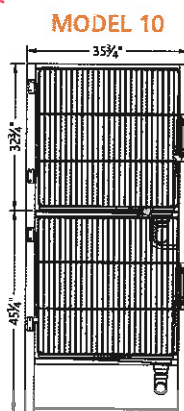
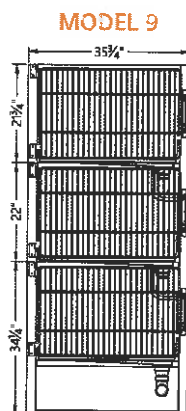
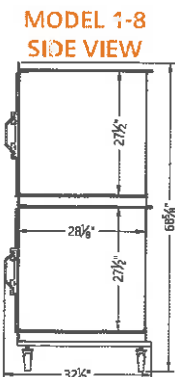
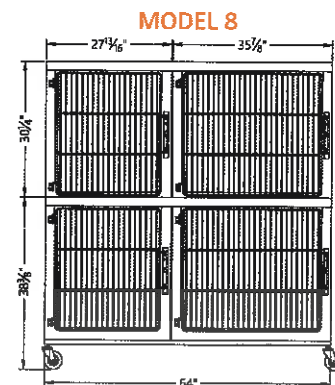
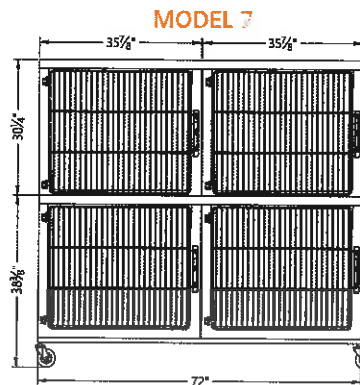
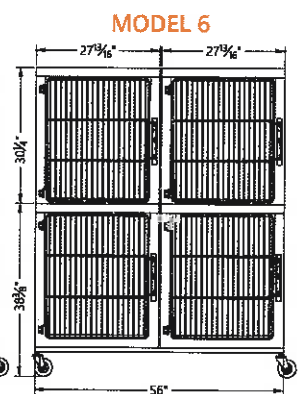
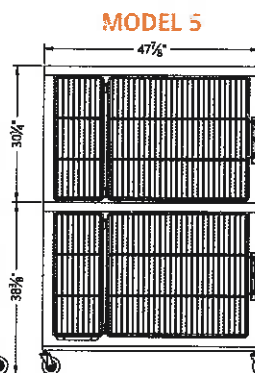
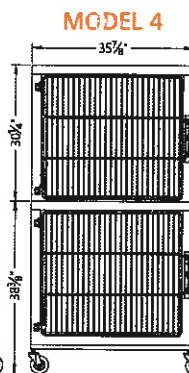
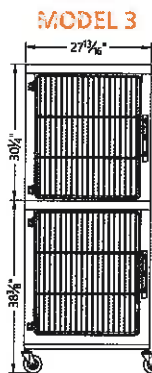
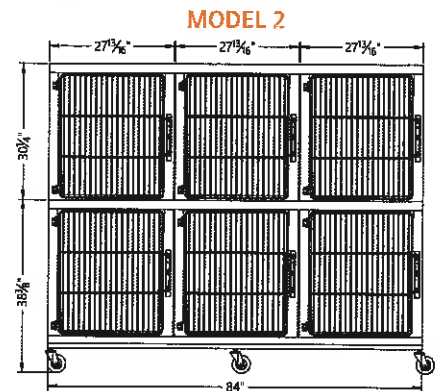
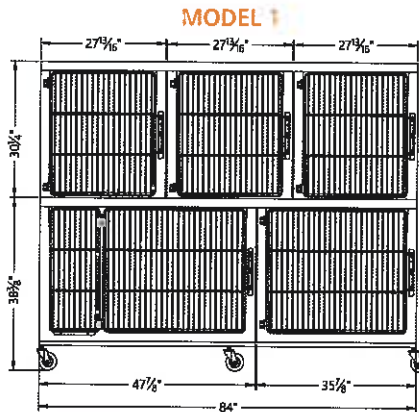
# Quiet Cottages™ Fiberglass Cages

## THE QUIET AND WARM ALTERNATIVE TO STAINLESS STEEL

- Manufactured to provide warm, attractive and quiet animal housing areas
- Smooth molded fiberglass construction provides a gentle radius for easy cleaning and promotes a healthy living environment
- Available in several sizes and a variety of configurations
- Some models offered with drains for even quicker cleaning and drying time
- Models offered with drains have a removable 3/4" grid grate
- Manufactured with welded stainless steel doors for durability
- Comes standard with dual point self-latching doors
- Models 1-8 and 12 come standard with swivel type casters for ease of movement
- Units are manufactured with a front debris and liquid retention lip
- Manufactured with a stainless steel support frame to maintain rigidity

Models 9, 10, and 11 all come equipped with the standard drain.

*4 (FOUR) w/ DRAINS*



# FOLD-UP WALL MOUNT TABLES

E

## Fold-Up Wall Mount Tables

### Benefits:

Maximize your office space using the Fold-Up Wall Mount Table. Torsion Spring technology allows for easy raising and lowering, and the underside is an attractive laminate.

### Features:

- The ONLY folding table on the market with radiused corners.
- 200 lbs. capacity
- Adjustable top allows for exact leveling of the work platform
- Optional laminate top available
- Specialized cabinetry available for extra storage.
- The adjustable top allows for exact leveling of the work platform.
- Table mounting template included.
- Easily mounts to the Utility Chase.
- Specs: Table top is 44½"L x 22½"W x 1"H. Five inches from the wall when folded up. Easy to mount to any standard 2" x 4" reinforced wooden stud wall with 16" or 24" stud centers.



903.1130.04 Peninsula 91 lbs.  
371



# Design Service For Prep-Procedure/Treatment Center

**SSCI DESIGNS ALL OF OUR CABINET AND TABLE PRODUCT LINES TO ALLOW INTEGRATION OF THE VARIOUS COMPONENTS FOR A VIRTUALLY ENDLESS NUMBER OF CONFIGURATIONS. OUR DESIGN STAFF CAN ASSIST YOU OR YOUR ARCHITECT.**

F



**Cabinet Arrangement with  
Recessed End Treatment Table  
Abutted to Front Edge of Countertop**

Full-width OPEN  
SHELVING 10'-0" VERIFY X



**Cabinet Arrangement with  
Recessed End Treatment Table  
Abutted to Front Edge of Countertop**



**Cabinet Arrangement with  
Recessed End Prep-Procedure and Treatment Tables  
Abutted to Front Edge of Countertop**

STAINLESS  
STEEL SINK

RECESSED END PREP. PROCEDURE  
TABLE W/ METAL GRATE (STAINLESS)

**Let** our design staff create a Prep-Procedure/Treatment Center integrated with our Modular Cabinetry. Using our standard tables and cabinets from this catalog, we can put together a variety of Prep-Procedure/Treatment/Storage options for your space.

Whether you're looking for a Prep-Procedure/Treatment Center with or without a Countertop Chase, or want to combine an Treatment or Prep-Procedure Table with Custom Cabinetry as shown here, SSCI can help. See Section 19, Undercounter Standard-Height Cabinets for cabinet selection and Sections 10 and 11 for Treatment and Prep-Procedure Tables selection.

Contact your SSCI Representative for to discuss the possibilities.



Prep-Procedure/  
Treatment Centers

In-Line Style, 1-Station Prep-Procedure/Treatment Center  
7-ft. 1.625-in. (2.17m) W, 3-ft. .875-in.(.94m) H, 2-ft. 1-in. (.64m) D



Imperial Prep-Procedure/Treatment Center Components

P/N	DESCRIPTION	COLOR	
		CABINET	TOP
<b>Imperial 6 Recessed-End Prep-Procedure Table</b> knee space, 3 drawers, 1 door hinged right L10AA04B1U0E0AS			
		- - - - †	
<b>Imperial Base Cabinet,</b> 1 door hinged right ARAOAEAHCDRFHDM			
		- - - - †	
<b>Imperial End Panel</b> DROKAEADAACHDP			
		- - - - †	
<b>Imperial Counter Top without cutout for sink</b> FCAJHAADYAAAAEL			
			- - - - †
<b>Faucet</b> 024601-E-Z-ZZ-V084-E*			
<b>Drain</b> 024647-Z-Z-ZZ-ZZZZ-Z*			

\*Faucet and Drain shown, sold separately, see Section 18 for selection.

Regal Prep-Procedure/Treatment Center Components

P/N	DESCRIPTION	COLOR	
		CABINET	TOP
<b>Regal 6 Recessed-End Prep-Procedure Table</b> knee space, 3 drawers, 1 door hinged right Y10AA04B1U0E0AS			
<b>Regal Base Cabinet,</b> 1 door hinged right NRAOAEAHCDRFHDM			
<b>Regal End Panel</b> QROKAEADAACFHDP			
<b>Regal Counter Top without cutout for sink</b> SCAJHAADYAAAAEL			
<b>Faucet</b> 024601-E-Z-ZZ-V084-E*			
<b>Drain</b> 024647-Z-Z-ZZ-ZZZZ-Z*			

\*Faucet and Drain shown, sold separately, see Section 18 for selection.

**Important:** These customer order requirements, in addition to other customer order requirements, must be satisfied prior to the beginning of manufacturing lead time:  
†Specify 4-digit Color code. See Color Selections, Section A, pages 1 & 2 for Color Codes.



SSCI laminated products are available  
in SSCI standard laminates,  
SSCI optional laminates,  
or Customer selected laminates.

## Deck-Mounted Work Board Swivel Gooseneck Faucets



### Lever Handle, Swivel Gooseneck Spout, Straight Sprayer

P/N	Description
024630-D-M-ZZ-S080-C	Lever handle, 8-in. (20.32cm) spread centers Swivel gooseneck spout with aerator 6-in. (15.24cm) Straight sprayer Stainless steel sprayer hose 80-in. (203.20cm) L

### Wrist Action Handle, Swivel Gooseneck Spout, Straight Sprayer

P/N	Description
024630-F-M-ZZ-S080-C	Wrist action handle, 8-in. (20.32cm) spread centers Swivel gooseneck spout with aerator 6-in. (15.24cm) Straight sprayer Stainless steel sprayer hose 80-in. (203.20cm) L



### Lever Handle, Swivel Gooseneck Spout, Angled Sprayer

P/N	Description
024630-D-M-ZZ-S080-A	Lever handle, 8-in. (20.32cm) spread centers Swivel gooseneck spout with aerator 6-in. (15.24cm) Angled sprayer Stainless steel sprayer hose 80-in. (203.20cm) L



### Wrist Action Handle, Swivel Gooseneck Spout, Angled Sprayer

P/N	Description
024630-F-M-ZZ-S080-A	Wrist action handle, 8-in. (20.32cm) spread centers Swivel gooseneck spout with aerator 6-in. (15.24cm) Angled sprayer Stainless steel sprayer hose 80-in. (203.20cm) L



**F** ↗

# Countertops For Imperial/Regal Base Cabinets



Imperial Counter top for Base Cabinet

## Countertop

Countertop designed for use with base cabinets that fit between two stations in In-Line Prep-Procedure/Treatment Centers,. The surface and all four edges are finished with high-pressure plastic laminate. The adjoining tables' counter tops abut against the edges of the base cabinet counter top. A stainless steel counter top is offered to match the stainless steel tops of abutted tables.

F

P/N	DESCRIPTION	DIMENSIONS
<b>LAMINATED</b>		
FCAJHABDRAAAAEL-____†	With Sink Cut-out	24-in. (60.6cm) W, 1 5-in. (3 81cm) T, 29 125-in.(73 98cm) D
FCAJHAADRAAAAEL-____†	Without Sink Cut-out	24-in. (60 6cm) W, 1 5-in. (3 81cm) T, 29 125-in.(73 98cm) D
<b>STAINLESS STEEL</b>		
SCAJHABDRAAAAEL	With Cut-out for sink	24-in. (60 6cm) W, 1 5-in. (3 81cm) T, 29 125-in (73 98cm) D
SCAJHAADRAAAAEL	Without Sink Cut-out	24-in. (60.6cm) W, 1 5-in. (3 81cm) T, 29 125-in (73 98cm) D



Imperial Counter top for Base Cabinet with Sink, Faucet and Drain

## Stainless Steel Sink

RIGHT SIDE - SEE FLOOR PLAN

Sink package includes sink, faucet and drain. Sized to fit the cutout in the counter top above.

P/N	DESCRIPTION
13337-00-CPAXBZ	Stainless Steel Sink, Faucet and Drain

**Important:** These customer order requirements, in addition to other customer order requirements, must be satisfied prior to the beginning of manufacturing lead time:  
†Specify 4-digit Color code. See Color Selections, Section A, pages 1 & 2 for Color Codes.



SSCI laminated products are available in SSCI standard laminates, SSCI optional laminates, or Customer selected laminates.

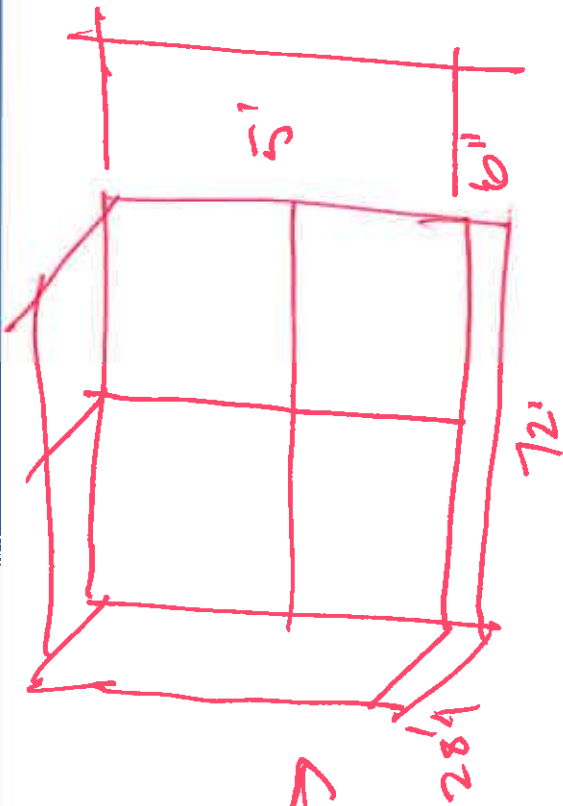
K



Stainless Steel Cat Suite > Stainless Steel Cat Suite, 36x30

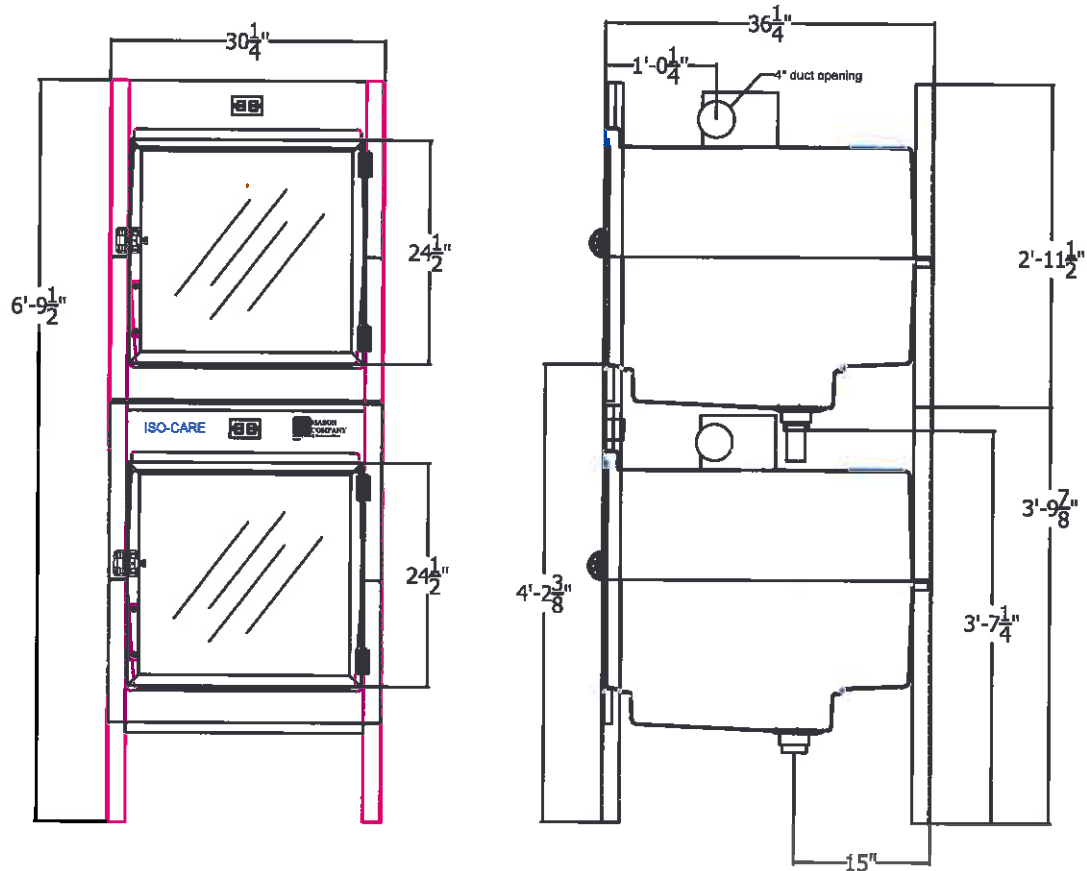
4 OF THESE →

CAT KENNELS -  
OWNER BY FARMETTE

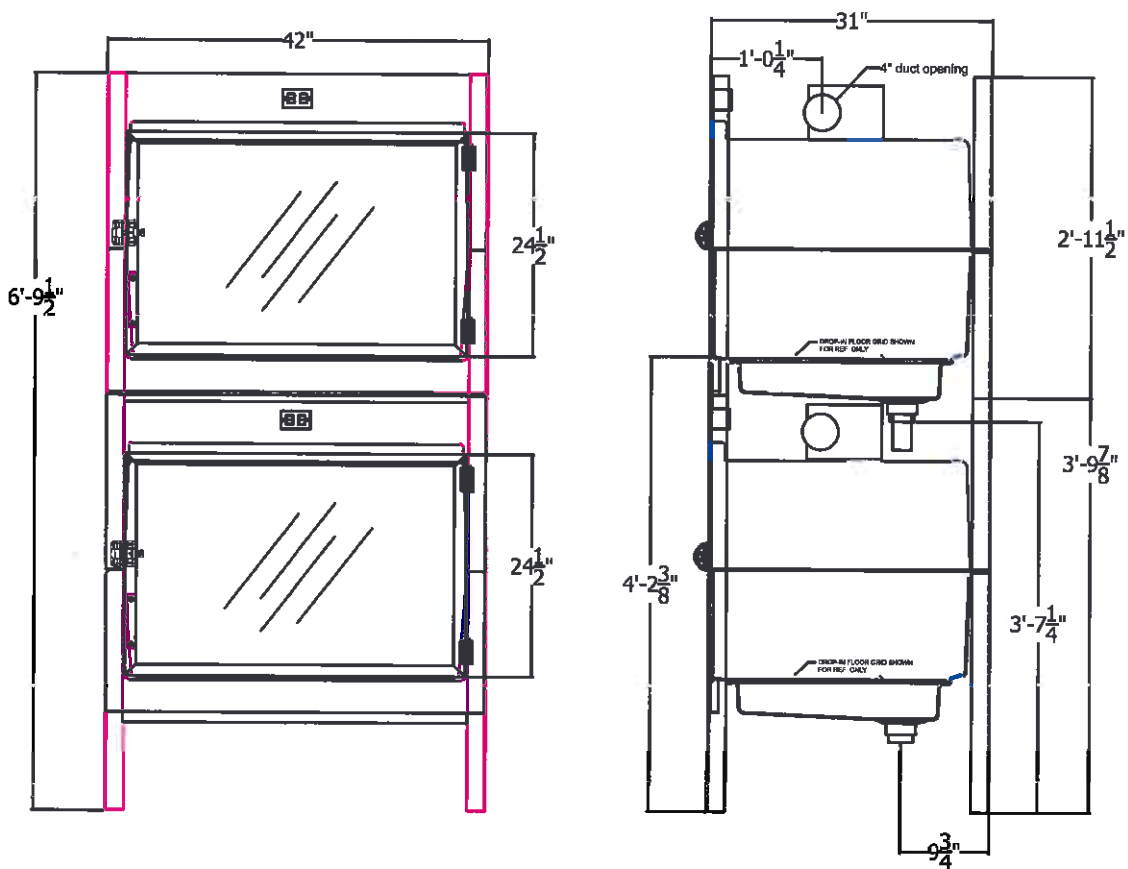


28 1/4 34 30

## 30 $\frac{3}{4}$ " x 36 $\frac{1}{4}$ " Iso-Care Unit

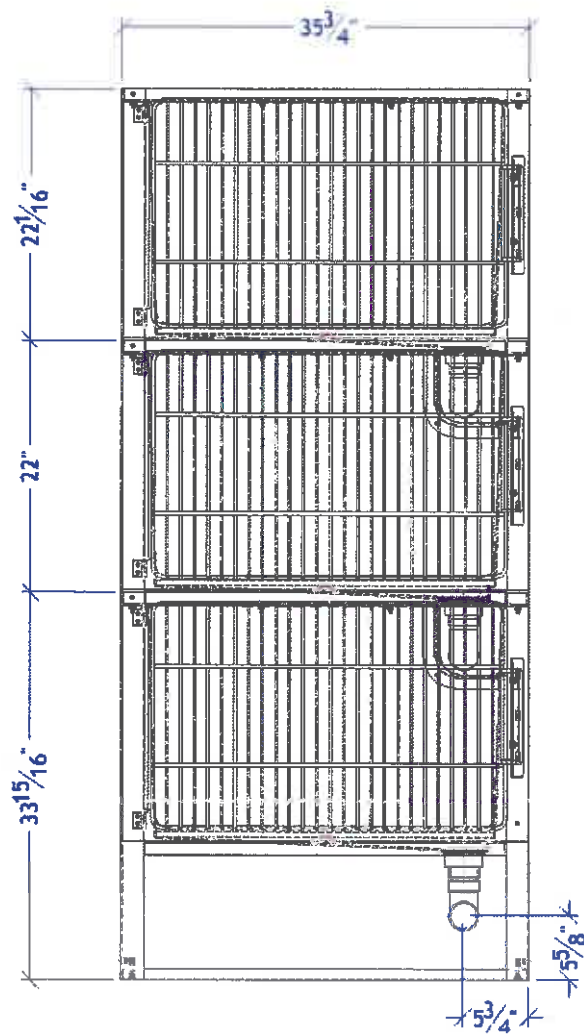


## 42" x 31" Iso-Care Unit



ITEM "M" Two (2) QUANTITY W/O DRAW.

## MODEL #9





7

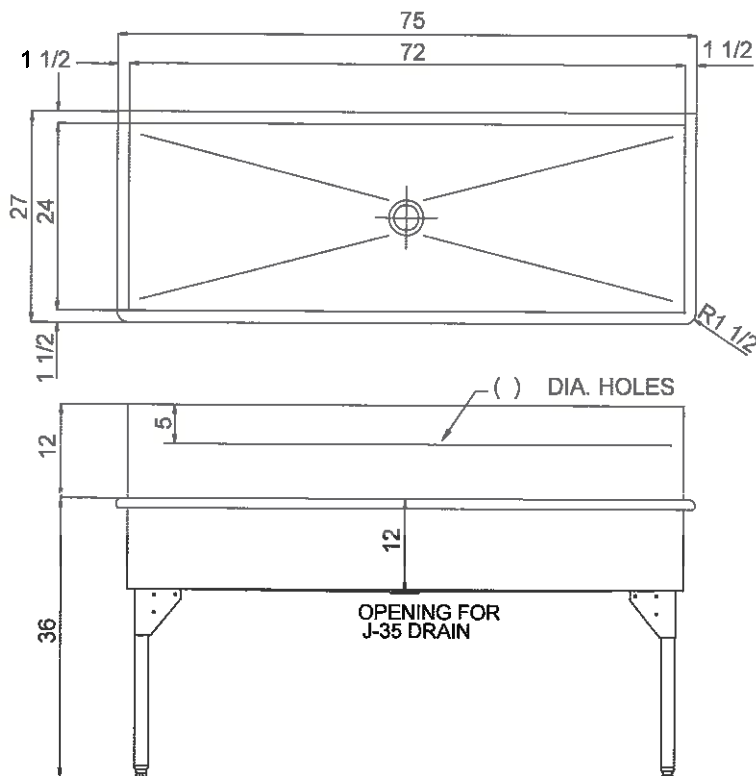


**COMMERCIAL GROUP**

**SB-172 (12/12)**

**ONE COMPARTMENT  
SQUARE CORNER -NO DRAINBOARD**

**SUBMITTAL DATA**



**SPECIFICATION**

Constructed of 14 gauge type 304, 18-8 stainless steel. Interior surfaces polished with a non-porous Hand-Blended Just Finish. Exposed exterior surfaces to have a brush finish. Supported on (4) 1 5/8 O.D. stainless steel tubular legs with stainless steel angle gussets and adjustable bullet feet. Drain punch #35 centered for Just J-35 unless otherwise specified.

**To be specified :**

■ Faucet hole punching:

- 1" (1) Hole Centered
- 1" (2) Holes on 8" centers
- 1" (3) Holes on 4" centers
- 1" Alternate Punching:

Faucet Model: \_\_\_\_\_

Punching required: \_\_\_\_\_

**Standard**

Depth - 12" (Water level 12")  
Backsplash height - 12"

**Alternate sizing**

1" 8" backsplash / 14" depth  
1" \_\_\_\_\_ backsplash  
1" \_\_\_\_\_ depth

Models listed will be fabricated based on the detail shown here. Standard depth is 12", standard backsplash height is 12", for other sizes, specify requirements. Custom size units will be based on the drawing shown, modified as required.



**89.76**

Gallon Capacity

**Capacity Matters**

Max 1D sizing with straight sided bowl configuration (non tapered sides). Tight corner radius design.

FUNCTIONAL DESIGN, QUALITY, AND SPECIFICATIONS LISTED DESCRIBE THE JUST STANDARD OF QUALITY. WHEN MAKING COMPARISONS WITH OTHER OFFERINGS, INSIST ON THE JUST QUALITY OF CONSTRUCTION. FOR ADDITIONAL INFORMATION REGARDING THE COMPLETE LINE OF JUST SINKS, FAUCETS AND DRAINS, VISIT OUR WEB SITE AT [www.justmfg.com](http://www.justmfg.com)

Job Name \_\_\_\_\_  
Customer \_\_\_\_\_  
Architect/Engineer \_\_\_\_\_

APPROVED FOR MANUFACTURING

MODEL NO. **SB-172** \_\_\_\_\_ QTY. \_\_\_\_\_  
COMPANY \_\_\_\_\_  
TITLE \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

**JUST MANUFACTURING COMPANY**

**9233 KING STREET . FRANKLIN PARK . ILLINOIS . 60131-2111**

PH: 847-678-5150

FAX: 847-678-6817

E-MAIL: [custserv@justmfg.com](mailto:custserv@justmfg.com)

[www.justmfg.com](http://www.justmfg.com)



# SUBMITTAL DATA



APPROVED FOR MANUFACTURING

## TECHNICAL DATA

### CONSTRUCTION:

Exposed wall or backsplash mount on 8 inch centers  
44" stainless steel hose with rubber interior  
Brass mixing faucet has 1/2" flanged union inlets  
Integral ball checks in faucet prevents water cross flow  
Flow rate 1.6 GPM  
Handles are fully open in less than 1/2 turn  
Wall bracket assembly for secure installation included  
Compliant with:

- \* NSF/ANSI 61/9- Annex G
- \* AB1953 Compliant
- \* ANSI A112.18.1 / CSA B125.1

## FINISH

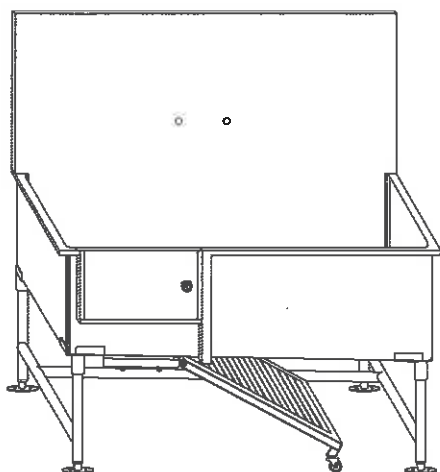
Polished chrome plate

JUST MFG. COMPANY CONTINUES TO MAKE QUALITY AND FUNCTIONALITY A MARK OF THE JUST PRODUCT LINE. WE RESERVE THE RIGHT TO CHANGE PRODUCT INFORMATION WITHOUT NOTICE. DIMENSIONS MAY CHANGE AND MAY BE SUBJECT TO CHANGE WITHOUT NOTICE. NO RESPONSIBILITY IS ASSUMED FOR USE OF SUPERCEDED OR VOIDED DATA. JUST MFG. CO. SINKS ARE MADE IN THE U.S.A. WHEN COMPARING OTHER BRAND PRODUCTS, BE SURE TO COMPARE USA QUALITY ALONG WITH FEATURES AND DIMENSIONS.



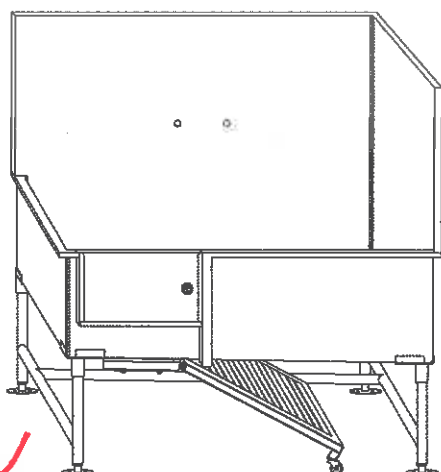
# Classic Bathing Tables with Access Door and Rotating Ramp

P



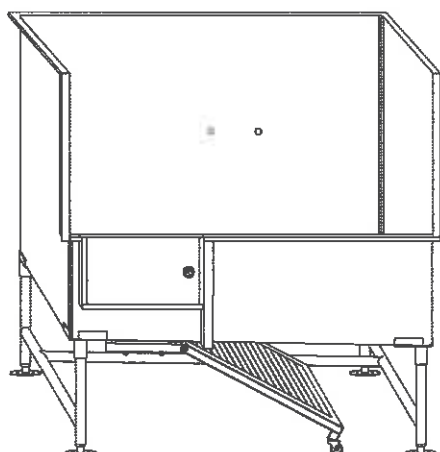
**Tub 15, Drain Right,  
Access Door Left,  
Splash Shield Back with Holes  
for Faucet**

P/N	WIDTH	
	In	Cm
<b>Holes on 8-in. centers for faucet</b>		
13023-BA-HJJRDW	48W	121.92W
13023-BA-JFJRDW	60W	152.40W
<b>Holes for single lever faucet</b>		
13023-BE-HJJRDW	48W	121.92W
13023-BE-JFJRDW	60W	152.40W



**Tub 15, Drain Right,  
Access Door Left,  
Splash Shields Back & Right End,  
Back with Holes for Faucet**

P/N	WIDTH	
	In	Cm
<b>Holes on 8-in. centers for faucet</b>		
13023-BC-HJJRDW	48W	121.92W
13023-BC-JFJRDW	60W	152.40W
<b>Holes for single lever faucet</b>		
13023-BG-HJJRDW	48W	121.92W
13023-BG-JFJRDW	60W	152.40W



**Tub 15, Drain Right,  
Access Door Left,  
Splash Shields Back, Left End  
& Right End,  
Back with Holes for Faucet**

P/N	WIDTH	
	In	Cm
<b>Holes on 8-in. centers for faucet</b>		
13023-BD-HJJRDW	48W	121.92W
13023-BD-JFJRDW	60W	152.40W
<b>Holes for single lever faucet</b>		
13023-BH-HJJRDW	48W	121.92W
13023-BH-JFJRDW	60W	152.40W

## Accessories for Classic Bathing Tables

### Stainless Steel Removable Bottom Racks

Fits into bottom of your bathing tub to give animals better footing during treatments. Allows water and loose hair and debris to flow through and down the drain away from the animal. Heavy-gauge stainless steel rack is welded at all intersections for strength and durability.

P/N	FITS TABLE STYLE		BATHING RACK SIZE (WxHxD)	
	In.	Cm	Inches	Centimeters
13100-00-GLAEDG	48W	121.92W	44.50 x 1.412 x 21.188	113.03 x 3.59 x 53.82
13100-00-IHAEDG	60W	152.40W	56.50 x 1.412 x 21.188	143.51 x 3.59 x 53.82



### Coated Removable Bottom Racks

For greater animal comfort, choose this Coated Bathing Rack. Non-slip PVC coating over expanded metal gives animals surer footing for even greater security during bathing and bathing. Fits into bottom of tub and allows water and loose hair and debris to flow through and down the drain away from the animal.

P/N	FITS TABLE STYLE		BATHING RACK SIZE (WxHxD)	
	In.	Cm	In.	Cm
13101-00-GLAEDG	48W	121.92W	44.50 x 3 x 21.188	113.03 x 7.62 x 53.82
13101-00-IHAEDG	60W	152.40W	56.50 x 3 x 21.188	143.51 x 7.62 x 53.82



### Coated Removable Raised Working Surface

Fits into the top of the Classic bathing tub to raise small animals up for ease of bathing.

P/N	BATHING RACK SIZE (WxHxD)	
	Inches	Centimeters
13102-00-DGAEDG	21.25 x 1.25 x 21.25	53.98 x 3.18 x 53.98

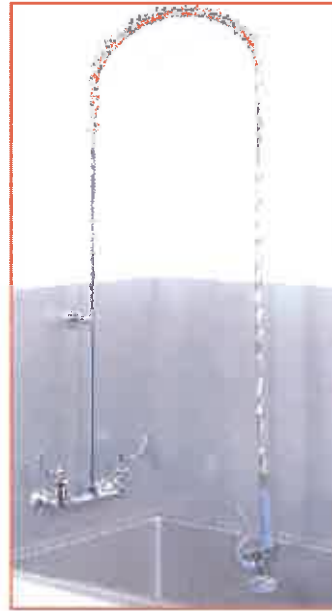


## Splash Shield-Mounted Mixing Faucet with Rinse



**Lever Handle,  
Riser & Bracket,  
Straight Sprayer**

P/N	Description
024637-D-Z-38-S080-C	Lever handle 8-in (20.32cm) spread centers 38-in (96.52cm) riser with mounting bracket Straight sprayer Stainless steel spray hose 80-in. (203.20cm) L



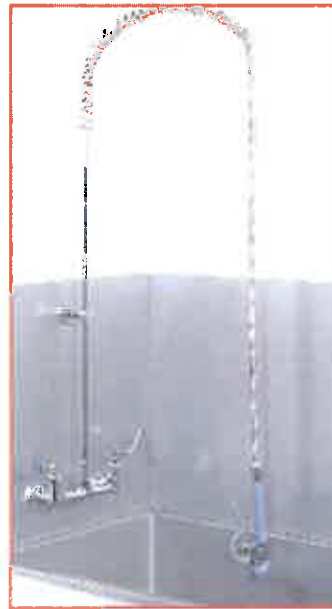
**Wrist Action  
Handle,  
Riser & Bracket,  
Straight Sprayer**

P/N	Description
024637-F-Z-38-S080-C	Wrist action handle 8-in (20.32cm) spread centers 38-in (96.52cm) riser with mounting bracket Straight sprayer Stainless steel spray hose 80-in. (203.20cm) L



**Lever Handle,  
Riser & Bracket,  
Angled Sprayer**

P/N	Description
024637-D-Z-38-S080-A	Lever handle 8-in (20.32cm) spread centers 38-in (96.52cm) riser with mounting bracket Angled sprayer Stainless steel spray hose 80-in. (203.20cm) L



**Wrist Action  
Handle,  
Riser & Bracket,  
Angled Sprayer**

P/N	Description
024637-F-Z-38-S080-A	Wrist action handle 8-in (20.32cm) spread centers 38-in (96.52cm) riser with mounting bracket Angled sprayer Stainless steel spray hose 80-in. (203.20cm) L

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COXREELS

## Hose Reel, Hand Crank, 3/4 in (F)NPT, 100ft

ZORO #: G0674208 MFR #: 117-5-100-SS

[Write the First Review](#)

0  
out  
of  
5  
stars



Help us improve our product images

# \$690.13

- **Hose Inside Dia.:** 3/4"
- **Item:** Carrete Manual para Manguera
- **Duty Rating:** Heavy Duty

[See full product details](#)

Drop Ship ⓘ

Item ships in **30 business days**.

This item ships **FREE**.

[Shipping & Returns](#)

Quantity

-	1	+
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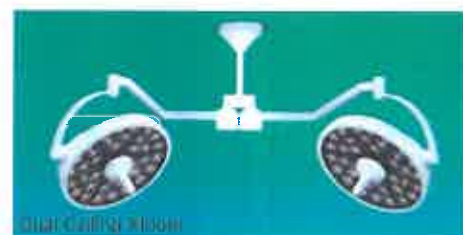


# EXCELED

A NEW ERA UNFOLDS WITH GREEN TECHNOLOGY

ExceLED represents the new standard in surgery lighting with its green technology LED lights. It features a larger reflector with high efficiency at low heat, a larger pattern and long life LED bulbs.

- Very Low Heat
- High Efficiency — Half the Electric Consumption of Standard Halogen Lights
- Long Life L.E.D.s
- 4300° Kelvin Color Temperature
- 65,000 Lux (6,000 foot candles)
- Available in a Variety of Mounting Options
- Patented 5-Stage Dimming and On/Off Switch, Controlled by the Removable Sterilizable Handle
- Additional Positioning Handle on Perimeter of Reflector
- EXCELED Minor Surgery Lights have auto seeking power supply (100V-240V)



P/N	DESCRIPTION
MI000000-061512	EXCELED Wall Mounted (100V-240V)
MI000000-061513	EXCELED Portable Floor with Casters (100V-240V)
MI000000-061514	EXCELED Ceiling Mounted One (100V-240V)
MI000000-061515	EXCELED Ceiling Mounted Two (100V-240V)
<i>Ceiling Rod kit is required. Correct height from the floor to the structural ceiling mount must be known at time of ordering.</i>	
<b>CEILING ROD KITS</b>	
Standard Ceiling Rod kit includes: Casted Mounting Ring, Rod and Wiring Harness. Mounted Ring must be attached to structural ceiling mount.	
MI000000-1001186	16" Ceiling Rod Kit for structural ceiling mount 7'6" - 8'6" above the floor.
MI000000-1001187	25" Ceiling Rod Kit for structural ceiling mount 8'7" - 9'6" above the floor.
MI000000-1001188	35" Ceiling Rod Kit for structural ceiling mount 9'7" - 10'6" above the floor.
Extended Ceiling Rod kit includes: H-D Casted Mounting Ring, Rod and Wiring Harness. Mounted Ring must be attached to structural ceiling mount.	
MI00-1000976-44	Extended Ceiling Rod Kit for structural ceiling mount 10'2" - 10'10" above the floor.
MI00-1000976-53	Extended Ceiling Rod Kit for structural ceiling mount 10'11" - 11'8" above the floor.
MI00-1000976-63	Extended Ceiling Rod Kit for structural ceiling mount 11'9" - 12'0" above the floor.
MI00-1000976-67	Extended Ceiling Rod Kit for structural ceiling mount 12'1" - 12'10" above the floor.
MI00-1000976-77	Extended Ceiling Rod Kit for structural ceiling mount 12'11" - 14'0" above the floor.

## CEILING TRACKS

ChutleTrak™ offers exceptional versatility since it allows the horizontal movement of the lights, in addition to the movement that the individual lights offer

MI000000-044011 CHUTTLE TRAK Single Trolley 70-in. (178 cm) holds one Ceiling Mount or one Dual Ceiling Mounts \*

MI000000-044012 CHUTTLE TRAK Dual Trolley 70-in. (178 cm) holds two Single Ceiling Mounts or a maximum of two Dual Ceiling Mounts \*

\* Ceiling Rod kit is required -- only 16" or 25" Rods can be used.

## ACCESSORIES

MI000000-1000616 Extra Sterilizable Handle

For Product Information Call TOLL-FREE 1-800-323-7366 • (847) 537-9320 • Fax (847) 537-9061

Hours: 8:30am - 5:00pm CST Monday - Friday

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SECTION 23 05 00  
GENERAL MECHANICAL PROVISIONS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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PART 1 - GENERAL

**1.01 CONDITIONS OF THE CONTRACT**

- A. Work included under this section of the specifications is subject to the provisions of the Contract Documents, General and Special Conditions.

**1.02 SCOPE**

- A. This section of the specifications describes materials and equipment to be incorporated into the plumbing, heating, ventilation, and air conditioning systems and requirements for performing related work. The contractor shall coordinate his work with other crafts to avoid conflicts.

**1.03 WORK INCLUDED**

- A. The work covered by this section includes providing all labor, equipment and materials as specified herein, shown on the drawings or required for a complete and satisfactory installation.

**1.04 RELATED WORK SPECIFIED IN OTHER SECTIONS**

- A. Cutting and repairing of walls, ceilings, roofs and structure, except as specified herein.
- C. Painting, except as specified herein.
- D. Providing electric wiring systems for power, interlock, remote starting, and control service except as specified herein.
- E. Installing motor starters and thermal overload switches.
- F. Installing remote push button stations and breakglass stations.
- G. Casework.

**1.05 CODES AND STANDARDS**

- A. Perform work in accordance with local, state, and federal regulations. Code requirements are minimum and shall be complied with at no additional cost to owner.
- B. In event of a discrepancy between contract documents and governing codes, comply with the codes. It will be assumed that such discrepancy was noted and cost of adjustment included in the bid price. Before starting work, submit to architect in writing a description of such adjustments or changes as may exist.
- C. Where requirements of the contract documents exceed code requirements, perform work in accordance with the contract documents.

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**1.06 ABBREVIATIONS & ACRONYMS**

A. These abbreviations and acronyms are used in this section:

ASHRAE - American Society of Heating, Refrigerating, and Air Conditioning Engineers, INC.

NFPA - National Fire Protection Association

SMACNA - Sheet Metal and Air-Conditioning Contractors National Association

UL - Underwriters= Laboratory

**1.07 DEFINITIONS**

A. To establish common meaning of terms in the mechanical work, use these definitions:

Provide - Furnish and install subject item, complete with accessory items for safe operation within the design intent.

Furnish - deliver subject item to project at point of final installation or use, except where other point is specified.

Install - make a final installation of items furnished.

Complete - with all accessory items required for safe operation within the design intent.

Indicated - as shown on drawings.

Concealed - where used in connection with insulation and painting of piping, ducts and accessories to mean hidden from sight, as in chases, furred spaces, pipe shaft or suspended ceilings.

Exposed - not concealed.

Condensation - visible moisture on surfaces.

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**1.08 PERMITS, INSPECTIONS AND STREET CONNECTIONS**

- A. Secure and pay for permits and inspections required for installation of the work. Deliver certification of inspections to architect.
- B. Arrange for and pay costs incurred for connections of water, gas and sewer, including furnishing of water meter, excavating, trenching, backfilling, and repairing payment as required for installation of the work where indicated on the drawings or specifically noted on the drawings.

**1.09 VERIFY EXISTING CONDITIONS**

- A. Contractor, before commencing work, shall examine all conditions on which this work is in any way dependent for perfect workmanship according to the intent of drawings and specifications and shall report to the general contractor, in writing, and conditions which prevent this contractor from performing acceptable work.
- B. It shall be assumed that contractor, before submitting his bid, shall have made an on-site inspection of the premises to determine the conditions under which he will be expected to perform this contract. No increase in contract price shall be allowed due to failure of the contractor to perform this on-site inspection.

**1.10 DESIGN CONDITIONS**

- A. Outdoor design conditions are in accordance with the ASHRAE Handbook of Fundamentals.

**1.11 DRAWINGS**

- A. Refer to the architectural drawings for such details as finishes, dimensions, materials, etc., of the building. Check architectural features such as door openings, wall thicknesses, wall locations, etc./ against the architectural drawings prior to the installation of the work.
- B. Mechanical drawings are diagrammatic, showing general locations of fixtures, pipes, etc., and are not to be scaled. Check all dimensions, existing conditions, etc., at building site. Provide off-sets, bends, fittings, and swing joints not shown, but required for proper installation of mechanical work.
- C. Furnish material and labor necessary to make a complete operating system except in such cases that are specifically indicated by others.
- D. This division of the specifications and accompanying drawings shall be considered as supplemental one to the other; materials and equipment and labor called for by one and not the other shall be supplied and installed as though specifically called for by both.
- E. As Built Drawings:



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Keep a blueline set of the contract or shop drawings exclusively for the purpose of recording the exact installed locations of piping and equipment as the project progresses. Upon completion of the work the contractor shall modify reproducible transparencies to reflect the noted changes throughout the project. The changes indicated on the transparencies shall be drafted in a neat and legible manner.

The as-built drawings shall include:

1. Mark all drawings AAS- BUILT CONSTRUCTION DOCUMENTS@.
2. Indicate the date drawings were prepared.
3. The Contractor=s name, address, and phone number.
4. Revise schedules per equipment submittal, including manufacturer and capacities.

**1.12 CONTRACTOR=S CLOSE-OUT CHECKLIST**

- A. The contractor shall, at the end of the projects, submit to the owner the PROJECT CLOSE-OUT CHECKLIST filled in, in its entirety. Final payment shall not be approved until checklist is approved. The checklist is found at the end of this section.

**PART 2 - PRODUCTS**

**2.01 LAYOUT BASIS**

- A. The system layout is based upon the use of particular items of equipment with such items identified by manufacturer=s make and model number. Physical dimensions, arrangement and service connections required for these particular items have been considered in making the layout. The equipment of another manufacturer listed as Aacceptable@ on that item of equipment may be submitted provided that energy requirements are no greater than for layout basis, and that additional service connections will be made at no additional cost to the owner.
- B. Should shop drawings disclose that the above requirements cannot be met on the basis of the submitted equipment, contractor shall furnish equipment as specified for ALayout Basis@.
- C. If equipment other than layout basis is proposed, the cost of all such changes as may be required in service connections and in structural systems to accommodate the proposed substitution, including additional engineering services, become the responsibility of the contractor and impose no additional cost to owner

**2.02 MATERIALS**

- A. All materials used for this project shall confirm to the current standards.

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- B. Where mention of trade names and brands are used in describing materials for this installation, they are to indicate type, quality and arrangement of material required. Equal materials by other manufacturers, if used, must be approved by architect, prior to installation.
  - C. There shall be no asbestos in any material furnished under this contract.

**2.03 DATA AND DRAWINGS TO BE SUBMITTED**

- A. Within 30 days after contract is signed, nine (9) copies of ALL equipment and ALL materials data requiring review shall be submitted thru proper channels after having been reviewed and stamped by subcontractor and general contractor.
  - 1. Data shall be bound in loose-leaf, three-ring, hard-back binders with pockets for diagrams  
Sectionalize with numbered tabs and preface with reference index.
  - 2. Cover sheet shall list project name, location, architect, engineer and general contractor.
  - 3. All items of equipment shall be submitted at same time except items such as temperature controls and diagrams that are dependent upon Areviewed@ data. They may be submitted separately at a later date. Provide sections in binders tabbed for these items to be inserted at a later date.
- B. All submittal data shall include project name, the model, style and size of item being submitted, local manufacturer=s representative and telephone number and all criteria shown on schedule on plans. Submitted items shall include but not be limited to the following:
  - 1. Pipe Specialties
    - a. Include capacity curve with pump suction diffuser.
    - b. Valves
    - c. Valve Tags
  - 2. Calibrated Balancing Valves
  - 3. Inertia Bases
  - 4. Pumps
    - a. Submit curves
  - 5. Chemical Treatment System
  - 6. Insulation
  - 7. Sump Pumps
    - a. Submit pump curves
  - 8. Fans
    - a. Submit fan curves on all fans including AHU=s and RTU=s.

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9. Flexible Duct
  10. Roof Curbs
  11. Provide size of equipment based on BTU's and horsepower. Provide structural calculations and details for all mechanical equipment over 100 lbs. operating weight. Provide Engineering design and calculations indicating resistance against uplift for all exterior equipment
- C. After reviewed data has been returned, contractor shall proceed with shop drawings of duct work and equipment room piping shall be submitted.
1. Duct Work Shop Drawings shall not be smaller than 1/4" = 1' -0" scale and must include duct size;  
equipment connections and pad layout; location, dimensioned from building structure; off-sets, bottom elevation above finished floor; liner where required, plenums and all accessories.
  2. Equipment Room Drawings shall include boilers, pumps, major piping (including control, check, isolation, balancing, and drain valves), pad layouts for all floor mounted equipment, air handlers and associated accessories. Scale to be not less than 1/4" = 1' -0".
  3. Duct Work and Equipment Room Shop Drawings shall be prepared on sheets the same size as contract documents. Enlarged copies of contract documents shall not be acceptable as shop drawings.
- D. Separate binders may be submitted for major sub-contractors such as HVAC; Plumbing; Fire Protection.
- E. Attention is directed to a paragraph entitled AOperation and Maintenance Instructions@, Section 15 905 requiring copies of reviewed data to be included in O&M manuals.

**2.04 CERTIFICATES**

- A. Upon acceptance by authorities having jurisdiction, certificates of occupancy required for this project including plumbing, HVAC, fire protection and Health Department certification of portable water shall be indicated by the responsible contractor(s).

**2.05 EQUIPMENT FOUNDATIONS**

- A. All floor mounted equipment, unless otherwise detailed, shall be mounted on 4" high concrete pads extending a minimum of 4" beyond longest dimension in each direction. Concrete shall be 3,000 psi.

**2.06 FIRE STOPPING**

- A. Piping penetrations in fire walls shall be sealed with UL listed fire stopping materials meeting requirements of ASTM E-814.
- B. Acceptable products are Dow Corning 3-6548 Silicone RTV Foam, Flamesafe T&B Firestop, 3M, Nelson Electric and GE Pensil.

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**PART 3 - EXECUTION**

**3.01 PROTECTION OF WORK DURING CONSTRUCTION**

- A. Provide protective covers, skids, plugs, caps and coatings to protect equipment and materials from damage and deterioration during construction.
- B. Store equipment and material under cover and off the ground.
- C. When outdoor storage is necessary, provide protective covers of sheet plastic of gauge suitable for the area involved and reinforced to withstand wind and precipitation. Set equipment and materials on skids or platforms of height sufficient to avoid damage from splattering and ground water.
- D. Plug ends of pipes when work is stopped to prevent debris from entering the pipes.
- E. Close open ends of ductwork with temporary closures of sheet plastic taped in place on horizontal ducts and sheet metal caps with drip overhangs for ducts opening upward.
- F. Do not operate any air handling systems during the construction period without filters in place to filter air entering the fan. Protect the exhaust fans by temporary filters cut from roll media and fastened over the air inlets.

**3.02 WORKMANSHIP**

- A. The entire contract shall be executed in a neat, substantial and workmanlike manner, according to the true intent and meaning of the plans and specifications. Any work not installed in a neat, substantial and workmanlike manner shall, when directed in writing, be removed and replaced at the contractor's expense without additional cost to the owner.

**3.03 TOOLS**

- A. The Contractor for this work shall furnish all tools, machinery, hoists and other means for proper installation of the work.

**3.04 TRENCHING, BACKFILLING AND PAVING**

- A. Install water service piping and sewers below recorded frost penetration line in compliance with applicable codes.
- B. Excavate trenches to sufficient width, shore trenches, and remove water as necessary to permit proper installation of the work.
- C. Backfill trenches only after piping has been tested, inspected, and locations of pipes and appurtenances properly recorded.

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- D. Maintain clearance from excavation to footings and outside bearing walls of 3 feet and an angle of not greater than 45-degrees to bottom of such footings or outside bearing wall.
  - E. Provide shoring when soil conditions and depth of excavation warrant shoring.
  - F. Where rock is encountered, remove rock to a depth of 6" below desired bottom of excavation and backfill with clean earth to desired level.
  - G. When piping is laid in fill or loose sand, tamp bottom of trenches to obtain 95% of dry maximum density compaction as determined by Standard Proctor Compaction Test, ASTM D698-58, prior to installation of pipes.
  - H. Use backfill free from rocks and debris, compacted in 6" layers as the excavation is filled. Take precaution to prevent damage to the piping.
  - I. Hand tamp backfill around the lines to depth of 2 feet above top of the lines and compact to obtain 95% of dry maximum density compaction as determined by the Standard Compaction Test ASTM D698-58.
  - J. Provide bell holes and continuous firm bedding for piping.

**3.05 CUTTING AND PATCHING**

- A. All cutting and patching needed for installation of mechanical system shall be included under this Division.
- B. No cutting will be permitted without prior approval by the owner.
- C. Patching will be done by the trade whose work has been cut and shall be paid for under the mechanical division of the specifications.
- D. Contractor shall furnish to other trades information such as size, position and arrangement of materials and equipment, so that openings in floors, walls, roofs, beams, and ceilings can be provided as construction progresses. When openings are omitted because of his failure to furnish information to the contractor, this trade at his expense, shall direct and pay general contractor to do cutting and patching required.

**3.06 EQUIPMENT FOUNDATIONS**

- A. Concrete foundations and steel supports, etc., shall be provided in accordance with the Concrete and Structural Division of the specifications.
- B. Concrete foundations shall have 3/4" beveled edges and all surfaces rubbed smooth prior to mounting equipment.
- C. Prepare structural slabs to receive pad and curbs. Roughen contact surface before pouring concrete.
- D. For equipment provided with gout holes, fill voids with non-shrinking grout after alignment and before

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operation of equipment.

**3.07 COORDINATION OF INSTALLATION**

- A. Coordinate work under this division with work under other divisions.
- B. Install work to fit into the spaces provided. Avoid damage on account of ill-timed work.
- C. Arrange work to provide maximum headroom and clearance consistent with the requirements of the documents.
- D. Except where otherwise noted, arrange piping to run either parallel or normal to building lines, and true to grade.
- E. Provide supports and anchors for work to avoid damage from movement.
- F. Place equipment, valves and unions requiring service in accessible locations.
- G. Install materials and equipment completely with piping, controls and accessories.
- H. Coordination of equipment located in ceiling plenums ( air conditioning equipment, ductwork, plumbing, lights, fire protection lines, structure, etc.) shall be done before installation is begun and continued during construction to assure proper space for maintenance of equipment and maneuverability of light fixtures in the grid.

**3.08 COUNTER FLASHING**

- A. All flashing methods and materials shall provide a complete watertight installation.
- B. Provide counter flashing for items placed on roof or piercing roof. General Contractor shall provide base flashing.
- C. Riser sleeves for piping and conduits in membrane waterproofed floors shall have flashing clamps attached to membrane. Large sleeves shall be shop fabricated. Sleeves shall extend 2 inches above finished floor.
- D. Drains and cleanouts in membrane water proofed floors shall have flashing clamps attached to the membrane.
- E. Ducts passing through roof shall be counterflashed with sheet metal, soldered to duct riser and extended down over roof curbs, which is properly flashed by the General Contractor. Apply heavy coating of roofing cement at junction of duct and counterflashing collar.

**3.09 CLEANING AND ADJUSTING**

- A. All equipment, pipe, valves and fittings shall be wiped clean, with all traces of oil, dust, dirt, and paint spots removed. Bearings shall be lubricated as recommended by the equipment manufacturer.

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All control equipment shall be adjusted to setting indicated.

**3.10 PAINTING**

- A. Clean surfaces of work under this Division and leave surfaces ready for painting. Colors shall be selected by Architect.
- B. Where surfaces of factory finished items are marred, refinish those surfaces to original condition with factory furnished touch up paint.
- C. The following, as a minimum, shall be painted:
  - 1. Steel equipment supports.
  - 2. Exposed ductwork where specified.
  - 3. Ferrous louvers and grilles where specified elsewhere.
  - 4. Exposed ferrous pipe hangers.

**3.11 NOTIFICATION BEFORE INSPECTION**

- A. Notify the architect/engineer in writing not less than five (5) working days before work is ready for inspection.

**3.12 COORDINATION OF ELECTRICAL WORK**

- A. Provide electrically operated equipment designed and built for operation with electric characteristics provided by Division 16. Verify voltage, horsepower, wattage and phase from electrical drawings before ordering equipment.
- B. Provide motor controls, systems controls, starters, contractors, etc., required for the mechanical systems complete as a part of the motor or apparatus which it operates, unless specifically noted to be provided under another section.
- C. Provide under the work of this section all other devices, line and low voltage control and interlock wiring, and additional conduit necessary but not indicated on the electrical drawings, all in accordance with material and installation requirements.
- D. Provide wiring diagrams required for the proper installation of the equipment under the work of this section.
- E. All mechanical assemblies containing multi-motors or electric heating elements shall be factory equipped with integral over-current protection for each motor/heater in accordance with the requirements of the N.E.C.

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3.13 GUARANTEE

- A. Contractor shall guarantee this work and make good without cost to the owner any defects in equipment, materials or workmanship which may develop within the period of one (1) year from date of acceptance or beneficial use by the owner.
- B. Refrigeration Compressors shall be provided with an additional 4 year warranty which shall include labor and refrigerant.



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MECHANICAL PROJECT CLOSE-OUT CHECKLIST

The following items as stipulated by Carter Watkins Associates and/or their Consultants are to be provided.  
The project will not be accepted as 100% complete until these items are provided to the appropriate parties.

	<u>ITEM</u>	<u>ACCEPTED BY</u>	<u>REPRESENTING</u>	<u>DATE</u>
1.	O & M Manuals	_____	_____	_____
2.	Copy of shop  drawings and submittals	_____	_____	_____
3.	Extended warranties  for HVAC equipment	_____	_____	_____
4.	Certification of  welders	_____	_____	_____
5.	Controls under  glass	_____	_____	_____
6.	As-builts	_____	_____	_____
7.	Test and	_____	_____	_____

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	balance report		
8.	Change out	_____	_____
	construction		
	filters in air		
	moving equipment		
9.	Fire protection	_____	_____
	documents		
	reviewed by		
	Insurance		
	Underwriter		
10.	Valve tags and	_____	_____
	charts		

END OF SECTION

SECTION 23 06 00  
BASIC MATERIALS AND METHODS

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.  
FAYETTE COUNTY ANIMAL SHELTER  
AUGUST 05, 2020

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PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The work covered by this section includes furnishing all labor, equipment, and materials as specified herein, shown on the drawings, or required for a complete and satisfactory installation.

1.02 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI)  
B. American Society of Mechanical Engineers (ASME)  
C. National Fire Protection Association (NFPA)  
D. Underwriters Laboratory

PART 2 - PRODUCTS

2.01 PIPING

- A. Domestic Water Systems:
1. Pipe, 3" size and smaller: Copper water tube manufactured in accordance with ANSI H23-1.
    - a. Type AL@ hard copper above ground.
    - b. Type AK@ hard or soft copper underground or in pipe trench.
  2. Fittings: Wrought copper seat joint conforming to ANSI B16.22.
  3. Screwed or flanged to sweat pipe connections cast brass, ASA B16.18.
  4. Joints:
    - a. 2" and smaller: 95-5 (95% tin and 5% antimony) solder.
    - b. 2 - 2" and larger: 95-5 (95% tin and 5% antimony) solder.
    - c. All joints below slab on grade shall be alloy solder melting not less than 1000 degrees F.
  5. Unions:
    - a. Cast brass or bronze with soldered connections. Unions 2" and smaller, ground joint; 2 - 2" and larger, flanged.
  6. Pipe, 4" diameter and larger:
    - a. Underground: 4" size shall be Class 51, 6" and larger shall be Class 50 ductile iron, ANSI A21.51-1976 with push on or mechanical joints with the bituminous outer coating. Fittings shall be 250 psi ductile iron, mechanical joints with bituminous outer coating.

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- b. Above Ground: 4" size and larger shall be type L hard drawn copper with wrought copper or cast brass fittings.
    - B. Soil, Waste, and Vent piping within the building and where indicated on the drawings.
      - 1. Pipe and Fittings:
        - a. Above slab-on grade and inside the building shall be PVC pipe and fittings properly marked to indicate the system complies with all Soil Pipe Standards 301-74.
        - b. Below slab-on grade and under floor shall be hub and spigot with oakum and lead caulked joints or at contractor=s option, neoprene one-piece elastomeric compression gasket joints for pipe bearing on virgin soil.
        - c. Sanitary outside building may be PVC or at Contractor=s option, extra strength vitrified clay with PVC joints.
      - 2. Pipe and Fittings:
        - a. ABS or PVC piping above and below slab on grade except in return air plenums.
        - b. ABS plastic DWV piping and fittings shall conform to ASTM Standard D2661 and shall be so marked. ABS solvent cement shall conform to ASTM Standard D-2235.
        - c. PVC plastic DWV piping and fittings shall conform to ASTM Standard D2665 and shall be so marked. PVC solvent cement shall conform to ASTM Standard D-2564. PVC primer shall be applied to pipe and inside of socket fittings before applying PVC solvent cement.
        - d. Pipe cement that is recommended by the manufacturer for use on neither ABS of PVC pipe shall not be permitted on the project.
        - e. All plastic pipe and fittings shall be NSF approved and shall be so marked.
        - f. All ABS and PVC plastic pipe and fittings shall have solvent socket ends.
  - C. Waste connections to service sink trap standards:
    - 1. Pipe: Galvanized Schedule 40 steel pipe.
    - 2. Fittings: 125 lb. galvanized, screwed, recessed pattern, drainage fittings.
    - 3. Options: Type AL@ copper with adapters.
  - D. Waste connections to lavatories, sinks, and drinking fountains:
    - 1. Pipe: Type AL@ hard copper manufactured in accordance with ANSI H23.1.
    - 2. Fittings: Cast brass alloy or wrought copper drainage fittings manufactured in

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accordance with ANSI B16.23.

- E. Soil connections to urinals:
  - 1. Pipe: Type AK@ copper with wrought copper pressure fitting or red brass nipples and cast brass fittings.
- F. Waste connections to water closet:
  - 1. Floor Mounted - Cast iron closet flange bolted to fixture with fixture setting seal gasket.
  - 2. Wall Hung - Chair carriers as specified with fixture.
- G. Condensate Drain Piping:
  - 1. Type AM@ copper tubing.
  - 2. Fittings:
    - a. Copper pipe: Sweat type wrought copper or cast brass.
    - b. Provide cleanout for all changes of direction exceeding 45 degrees.
- H. Chilled Water and Hot Water Space Heating Piping:
  - 1. Pipe: Schedule 40 black steel conforming to ASTM A120.
  - 2. Fittings: Wrought carbon steel butt welding fittings, conforming to ASTM A234, for pipe sizes 2-1/2" and larger. Malleable iron, 150 lb. class, screwed conforming to ASTM A47, for pipe sizes 2" and smaller.
  - 3. Alternate Fittings: Grooved piping and fittings.
    - a. Acceptable manufacturers are Victaulic and Grinnell Groove-loc.
    - b. Fittings shall be rigid type unless noted otherwise on plans.
    - c. Manufacturer shall submit piping shop drawings.
- I. Gas Piping:
  - 1. Pipe: Schedule 40, black steel pipe conforming to ASTM A-120, factory coated and wrapped for underground, uncoated for above ground.
  - 2. Fittings: Carbon steel, butt weld for sizes 2-1/2" and larger and black malleable iron, screwed for 2" and smaller. Brushings are not permitted.
  - 3. Corrosion protection: Apply corrosion resistant coating, to all underground joints and damaged factory wrap.
  - 4. Gas pipes shall not be installed below floor slabs on grade, in partitions, walls or plenums except as directed and as approved by local codes.
  - 5. Provide gas cock for each piece of equipment.
- J. Compressed Air Piping: (125 psig)

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1. Pipe: Type AL@ copper.
  2. Fittings: Wrought copper sweat joint conforming to ANSI B16.22. Construct joints with Silfos.

OR

3. Pipe: Schedule 40, black steel conforming to ASTM A-120.
4. Fittings: Carbon steel, 125 lb. butt weld for size 2-1/2" and larger; black malleable screwed for 2" and smaller.

K. Underground Piping Systems:

1. The layout basis of the following chilled water, hot water systems is Thermal Pipe Systems. Acceptable alternates are Ricwil, Permapipe, and Thermacore.
2. Space Heating Hot Water Piping:
  - a. HEAT-TITE shall be used for hot water supply and return using a rubber ring jointing method. Unless otherwise specified, all pipe, fittings, valves, and accessories shall conform to the requirements of ANSI B31.1, and shall be of the proper type for pressure and temperature of the heating or cooling water.
  - b. Steel Carrier Pipe: Carrier pipe shall be steel pipe.
  - c. HEAT-TITE COUPLING: The HEAT-TITE coupling shall be Reinforced Thermosetting Resin Plastic (RTRP). The RTRP coupling shall be glass filament wound epoxy ring, shall be machined into the coupling. The length of the coupling shall be such that when correctly assembled it will give the proper end separation.
  - d. Rubber Sealing Rings: Rubber sealing rings for HEAT-TITE piping shall be molded heat resistant Ethylene Propylene Diene Monomer (EPDM) using a properly vulcanized compound. The ring surfaces shall be smooth and free from all porosity and internal voids.
  - e. PVC Casing Pipe: The Polyvinyl Chloride (PVC) Casing Pipe shall be of virgin PVC resin meeting the classification requirements of ASTM D1784. The thickness shall be as shown on the following pages.
  - f. Rubber End Seals: Rubber end seals for insulated HEAT-TITE shall be a high temperature (HT) heat resistant Ethylene Propylene Diene Monomer (EPDM) molded rubber compound. All surfaces shall be smooth and free of voids.

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- g. Polyurethane Foam Insulation: Polyurethane foam insulation shall meet the following specifications:
- |                              |  |
|------------------------------|--|
| Type:                        | Two component urethane   |
| Compressive Strength:        | 25 psi parallel min at 5% comp   |
| Shrinkage:                   | None at 70 F   |
| Free Rise Density:           | 1.5 to 2.5 lbs / cu. ft.   |
| Aged AK@<br>(70 F - 72 hrs): | 0.140 BTU per inch, per hour, per degree Fahrenheit, per s.f.  |
| Closed Cell Content:         | 90%  |
| Insulation Concentricity:    | Carrier Pipe shall be concentric to casing pipe. The allowable maximum deviation from center line of carrier pipe shall be plus or minus 1/4 inch at the casing center point and plus or minus 1/16 inch at the end seals. |
- h. Casing-Tite Coupling: The Casing-Tite coupling shall be of virgin PVC Resin meeting classification requirements of ASTM D1784. The coupling shall be SDR 51 or heavier. The rubber rings shall meet ASTM D1869. The Casing Tite coupling shall have a groove molded into each end and the sealing rings inserted into the groove at the factory.
- i. Insulated Fittings: Fittings may be preinsulated by Thermal Pipe Systems, Inc. using the same insulation thickness and casing as the pipe. Where necessary laid-up fiberglass casing will be substituted in all or part of the fitting. A thrust plate of the proper size shall be provided. End seals on fittings shall be the same as used on the pipe.
- j. Wall Penetration Sleeves: Provide where piping passed masonry or concrete walls, floors, and roofs. Sleeves in outside walls below and above grade, in floor, or in roof slabs, shall be schedule 40 or standard weight coated black steel pipe. Space between piping or insulation casing, and the sleeve shall be sufficient to allow proper

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water tight sealing, but never less than 2". Sleeves shall be held securely in proper position and location during construction. Sleeves shall be of sufficient length to pass through entire thickness of walls or slabs. Sleeves in floor slabs shall extend 2 inches above the finished floor. In existing concrete manholes or building, wall penetrations may be made using the Acore drilling@ methods providing proper care is taken to drill the holes to the size needed and square to the line of the pipe.

- k. Wall Penetration Seals: All wall penetrations shall be sealed to prevent water from entering the building or manhole. The sealing material shall be as specified by the engineer.
- l. Insulation: Thickness of insulation for HEAT-TITE pipe and fittings shall be as shown below.
- m. Temperature and Pressure: The HEAT-TITE piping system and all of its components to operate up to 150 psig at 250 degrees F, plus typical surges.
- n. Dimensions and Weights of insulated HEAT-TITE piping and fittings are as shown below.

SCHEDULE	PIPE SIZE	INSULATION THICKNESS	WT. (LBS/FT)
80	2	.92	105.6
80	2	1.20	209.4
80	4	1.67	316.8
80	6	1.59	531.8
80	8	1.57	781.8
80	10	1.49	1028.2



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80	12	1.38	1416.0
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3. Chilled Water Piping:

- a. KOOL-KORE shall be used for chilled water service, using a rubber ring jointing method.
- b. PVC Carrier Pipe: Carrier pipe shall be Polyvinyl Chloride (PVC) 160 psi pipe - SDR 26 in accordance with ASTM D2241. Pipe shall be extruded from clean, virgin approved class 12454A PVC compound conforming to ASTM D1784.
- c. PVC Casing Pipe: The PVC casing pipe shall be of virgin PVC resin meeting the minimum classification requirements of ASTM D1784. The thickness shall be as shown on the following pages.
- d. Rubber Sealing Rings: Sealing rings for the PVC carrier pipe shall be a molded solid compression type rubber compound suitable for the service and pressure of the system.
- e. Rubber End Seals: End seals for insulated KOOL-KORE shall be molded rubber with a compression type seal.
- f. Polyurethane Foam Insulation: Polyurethane foam insulation shall meet the following specifications:

Type:	Two component urethane
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Compressive Strength:	25 psi parallel min at 5% comp
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Shrinkage:	None at 70 F
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Free Rise Density:	1.5 to 2.5 lbs / cu. ft.
Aged AK@: (70 F - 72 hrs)	0.140 BTU per inch, per hour, per degree Fahrenheit, per s.f.
Closed Cell Content:	90%

Insulation Concentricity:

Carrier Pipe shall be concentric to casing pipe. The allowable maximum deviation from center line of carrier pipe shall be plus or minus 1/4 inch at the casing center point and plus or minus 1/16 inch at the end seals.

- g. Wall Penetration Sleeves: Provide where piping passes through masonry or concrete walls, floors, and roofs. Sleeves in outside walls below and above grade, in floor, or in roof slabs, shall be schedule 40 or standard weight coated black steel pipe. Space between piping or insulation casing, and the sleeve shall be sufficient to allow proper water tight sealing, but never less than 2". Sleeves shall be held securely in proper position and location during construction. Sleeves shall be of sufficient length to pass through entire thickness of walls or slabs. Sleeves in floor slabs shall extend 2 inches above the finished floor. In existing concrete manholes or building, wall penetrations may be made using the Acore drilling@ methods providing proper care is taken to drill the holes to the size needed and square to the line of the pipe.
- h. Wall Penetration Seals: All wall penetrations shall be sealed to prevent water from entering the building or manhole. The sealing material shall be as specified by the engineer.
- i. Insulation: Thickness of insulation for KOOL-KORE pipe shall be as shown below.
- j. Temperature and Pressure: The KOOL-KORE piping system and all of its

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components are designed to operate at temperatures up to 70 F at 160 psig or at reduced pressures for elevated temperatures, as follows:

<u>TEMP. F</u>	<u>PRESSURE psig</u>
80	144
90	121
100	102
110	80
120	64
130	49

- k. Dimensions and weights of insulated KOOL-KORE piping systems are as shown below.

<u>SCHEDULE</u>	<u>PIPE SIZE</u>	<u>INSULATION THICKNESS</u>	<u>WT. (LBS/FT)</u>
40	4"	1.67	143

## 2.02 PIPE SPECIALTIES

### A. Escutcheon Plates:

1. Escutcheon plates: Chromium-plated, not less than 20 gauge steel, split pattern,

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set screws on ceiling plates, spring clips on others, sized to fit over insulation and to cover sleeves.

2. For exposed piping in flush sleeves in finished areas: Grinnell Fig. 10, F & S Fig. 602, Perfection Fig. 10.
3. For exposed piping where sleeves extend beyond penetrated surface, provide deep pattern type.

B. Pump Suction Diffuser:

1. Cast iron body, steel or cast iron outlet guide vanes, removable stainless steel strainer and fine mesh brass start-up strainer.

C. Triple Duty Valve:

1. Angle or straight type combination shut-off, balancing, non-slam check valve with cast iron body, bronze disc and seat, and stainless steel valve stem and spring.
2. Install valve with ample clearance for valve stem and service.

D. Air Purger:

1. Steel or cast iron body, flanged connections for horizontal, in-line installation, and tapings for vent and drain connections.

E. Air Vents:

1. Automatic Air Vents shall be Armstrong Model AAE-750, or equal, installed in a vertical position with a gate valve to isolate vent for service or replacement.
2. Manual Air Vents shall be Armstrong No. 72, or equal up to 75 psig operating pressure or lever handle brass cock rated for operating pressure. Provide brass goose neck termination.

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F. Automatic Fill Valve:

Armstrong Model RD or HRD or equal as required for operating pressure of installation.

G. Expansion Tank:

Taco Model CAX or equal ASME precharged bladder expansion tank stamped 125 psig working pressure with replaceable bladder, rated for 240-degrees F. at the tank and air charging valve to facilitate precharge pressure to meet actual system conditions.

H. Backflow Preventer: (Make-up Water System)

1. Watts Model 9D or equal, tested and certified under A.S.S.E. Standard 1012-1980 or CSA Standard B64.3.

I. Water Pressure Reducing Valve (Make-up water system) - Armstrong RD-40, or equal bronze construction with built-in strainer.

J. Strainers shall be Y-pattern type with cast iron body. Strainers shall have removable 316 stainless steel or monel screens and shall have perforations to provide a net free area through the screen of at least 3 times that of the entering pipe. Perforations shall be 1/8" diameter for chilled, hot, and make-up water service. Strainers 2-1/2" and larger shall be provided with a plugged gate valve and nipple the full size of the strainer blowdown outlet. Blowdown outlets shall be located at the low point of the strainer. Strainers 2" and smaller shall be threaded. Strainers 2-1/2" and larger shall be flanged.

K. Flexible Pipe Connections: Flexible pipe connections shall be stainless steel corrugated metal hose with high tensile stainless steel wire braid for ferrous pipe and bronze corrugated metal hose with high tensile bronze wire braid with copper pipe. Connections for pipe 2-1/2" and smaller shall be male pipe thread, and for pipe 3" and larger shall be 150 lb. flange ends. Minimum pressure rating shall be 150 psig wwp. Rubber hose connectors for closed loop heat pumps will be furnished with the heat pump units.

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2.03 ACCESS PANELS - BUILDING

- A. Flush, hinged door, locking type steel access panel and frame. Access panels shall be UL fire rated same as structure in which installed.
- B. Panel size 24" x 24" unless indicated otherwise on drawings.
- C. Frame styles specifically designed for setting in bare masonry, plastered surfaces, dry wall, or in acoustical tile as required.

2.04 CORROSION RESISTANT COATINGS

- A. Acceptable manufacturers: Koppers Bitumastic Super Service Black, Royston Laboratories A-51, Johns-Manville ATranstex V20".

2.05 PIPE HANGERS AND SUPPORTS

- A. Products manufactured in accordance with MSS SP58 and conforming to Federal Specification VWH171e, MSS SP69, UL203, NFPA13, and NFPA24 are acceptable. The following Grinnell figure numbers are used as a guide.
  - 1. Bare Copper Pipe - Fig. CT-99.
  - 2. Bare Steel Pipe - Fig. 260.
  - 3. Insulated Pipe - Fig. 260 sized to fit over insulation and with properly sized Fig. No. 167 shield.
  - 4. Vertical Pipe - Fig. CT-121 or Fig. 261.
    - a. Bare copper pipe must be isolated from contact with steel riser clamp by rapping with sheet lead or other acceptable material. Fig. CT-121 coated clamp may be used.

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5. Several horizontal pipes in the same plane may be supported on trapeze hangers spaced as required for the smallest pipe.

**2.06 SLEEVES**

- A. Sleeves shall be standard weight steel pipe.
- B. Sleeves shall be of sufficient size for pipe and insulation to pass through.
- C. Exposed sleeves through floors shall project 2" min. above finished floor.
- D. Pro-Set or equal sleeve system may be used in lieu of above.

**2.07 DIELECTRIC COUPLINGS**

- A. Acceptable: Capitol Type CS, Epco FX, and Clearflow Dielectric Waterway.
- B. Description: Screwed ends, dielectric isolating section.

**2.08 VALVES**

- A. General:
  - 1. All gate and globe valves shall be designed for repacking under pressure when fully opened and shall be equipped with packing suitable for the intended service.
  - 2. Valves used in copper pipe systems up to and including 3" size shall be similar and equal to those described herein for threaded valves up to 2" size.
  - 3. Face to face and end to end dimensions of valves shall conform to ANSI B16.10.
  - 4. Insofar as possible, all valves of the same type shall be of the same manufacturer.
- B. Gate Valves:

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1. Valves 2" and smaller shall be bronze body, solid wedge, rising stem, union bonnet, equal to Crane 428UB, Jenkins 4TU, Milwaukee 1152 or Stockham B-105.
2. Valves 2-1/2" and larger shall be flanged and iron body, bronze trim, OS&Y equal to Crane 465-1/2, Jenkins 651-C, Milwaukee F-2885 or Stockham G-623.

C. Globe Valves:

1. Valves 2" and smaller shall be bronze body, union bonnet, integral seat, renewable disc, equal to Crane 7, Jenkins 106A, Milwaukee 590, or Stockham B-22.
2. Valves 2-1/2" and larger shall be iron body, composition disc, flanged ends, bolted bonnet, bronze mounted, equal to Crane 351, Jenkins 613C, Milwaukee F-2981, or Stockham G-512.

D. Check Valves:

1. Valves 2" and smaller shall be bronze body, horizontal swing, Y pattern with removable discs equal to Crane 37, Jenkins 92A, Milwaukee 509, Stockham B-319.
2. Valves 2-1/2" and larger installed horizontally shall be iron body, bolted bonnet, horizontal swing with removable seat and disc equal to Crane 373, Jenkins 624-C, Milwaukee F-2974, Stockham G-931.
3. Valves 2-1/2" and larger installed in vertical position shall be iron body, globe type, silent design, bronze mounted with stainless steel spring and flanged end connections equal to Milwaukee 1800, Mueller 105-AP, APCO 600.

E. Ball Valves:

1. Ball valves shall be 2" and smaller for water and air service and shall have a 2-piece bronze body, teflon seat and brass ball equal to Crane 2180, Jenkins 902-T, Milwaukee BA-200, Stockham S-216-BR-RT. Provide extended handles on insulated piping and memory stop for manual balancing.



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F. Butterfly Valves:

1. Butterfly valves for water piping 2-1/2" and larger shall be lug type with extended neck, cast iron body, bronze alloy disc, stainless steel stem equal to Crane 14, Jenkins 232E, Milwaukee ML-1233-E, Stockham LG711BS3E. Provide lever handles on valves 12" and smaller and gear operators on valves larger than 12".

G. Hose end drain valves shall be gate valves with 3/4" hose thread adapter screwed or soldered into valve.

H. Manual balancing valves, non-calibrated-semi-steel body, neoprene coated, eccentric plug, wrench operator, straightway, memory stop 175 #wog rating.

1. 2" and smaller, screwed ends - Homestead 1512; DeZurik 118S; OIC 811; Milwaukee BBFS100.
2. 2-1/2" and larger, flanged ends - Homestead 1522 and 3" and 4", 1232 larger; DeZurik 118F, Illinois Products Series 5000.

I. Calibrated Balancing Valves - calibrated for flow balancing, pressure tapping takeoffs, positive shut-off valve with memory stop. Valves shall be supplied with preformed Polyurethane insulation cover.

1. 2" and smaller, screwed ends - Armstrong CBVI; Illinois Series 6000.
2. 2-1/2" and larger, flanged ends - Armstrong CBVII; Illinois Series 6000. (Note: Illinois flow measuring device larger than 1-1/4" must be accompanied by balancing valve series 5000.
3. A compatible portable flow measurement meter shall be furnished to the owner at the end of the job.

J. Automatic Flow Control Valves:

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1. Autoflow, Griswold, or equal, pressure compensating flow control valves in one piece configuration consisting of ground joint union and factory-set flow control unit.
2. Valves shall be brass or stainless steel.
3. Valves must be marked to show direction of flow.

2.09 VIBRATION ISOLATION DEVICES

- A. Acceptable: Amber / Booth, Consolidated Kinetics, Korfund, Mason, VECO, and Vibration Mountings and Controls, Inc.
- B. Supply all vibration isolation devices from a single manufacturer.
- C. Select vibration isolation equipment to give uniform loading and deflection, according to weight distribution of equipment.
- D. Spring isolation, generally: spring diameter not less than 0.8 of spring operating height. Provide springs with a minimum additional travel to solid equal to 50% of the rated deflection. Select spring with ratio of horizontal spring constant to vertical spring constant between 1 and 2.
- E. Un-housed Spring Type: Provide with leveling bolts for attaching to equipment, vertical resilient limitstops with a minimum clearance of 2" maintained around restraining bolts and between the housing and spring, limit stops out of contact during normal operation. Size for 1" static deflection.
- F. Vibration Hanger: Provide with a steel spring and a double deflecting neoprene element in series. Elastomer element with a minimum static deflection of 1/4"; steel spring static deflection of 1", except for the two isolators nearest the vibrating equipment with a static

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deflection of 1-1/2 times, and equal to, the static deflection of the isolated equipment, respectively. Install with spring element concentric to rod. Isolate hanger rod from steel housing with neoprene bushing.

**2.12 TEST PLUGS**

- A. Universal National, 2" N.P.T. brass body, with neoprene test plug valve insert.
- B. Acceptable Manufacturers: No. 700 Pete=s Plug or equal.

**2.13 PIPING IDENTIFICATION**

- A. General: Install color coded identification and direction markers after completion of painting and thermal insulation work unless otherwise noted, all in accordance with ANSI Standard A13.1, 1975.
- B. Materials: Equal to W.H. Brady Co. cataloged systems. Black stencil.
- C. Locations:
  - 1. Mechanical Equipment Rooms:

Within 18" of each point of entry and exit from all rooms.

Withing 3 feet on each side of each 90-degree elbow, tee, and connection to equipment or vessel.

At not over 20 foot intervals, measured along centerline of pipe.
  - 2. Above Suspended Ceilings:

Within 18 inches of each valve or valve assembly.

At tees, identify both main and branch within 3'-0" of tee.

Within 3 feet of each 90-degree elbow.

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3. Piping Concealed in Chases or Shafts: Identify each pipe visible through access door or panel.

4. Piping exposed in rooms other than Mechanical Equipment Areas:

Omit identification on piping 2 inch size and smaller exposed at connections to equipment or plumbing fixtures.

With the above exception, identify at not less than one point each piping run visible in each room, with identification at not over 20 foot intervals measured along centerline of pipe.

#### 2.14 VALVE IDENTIFICATION

- A. General: Valves shown on drawings except those isolating individual pieces of equipment shall be identified with brass tags and chart listing all valves by numbers. Each valve identification tag shall be 18-gauge polished brass, 1-1/2 inch diameter with service indicated by 1/4 inch, stamped, black-filled letters and valve number indicated by 7/16-inch stamped, black-filled numerals. Tags shall be fastened to valves with meter seals, brass S hooks or brass jack chain to permit easy reading.
- B. Identification: Each valve tag shall have an identifying letter designating the system, and an identifying number designating the valve. Identifying letters shall be those utilized in the Legend.
- C. A chart of all valves showing the valve identification number, location, purpose, and / or special information shall be mounted in an aluminum frame under 1/8" sheet plastic and secured to a wall as directed. Valve chart wording and numbering shall be approved prior to fabricating tags.
- D. Manufacturer: Tags shall be as manufactured by W.H. Brady Company, Seton Name Plate Corporation, or Markem Corporation.

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2.15 NAMEPLATES

- A. General: Provide for all equipment, motor starters, remote push-button stations, insertion type thermostats, remote bulb thermometers, filter gauges, remote pressure gauges, fans, pumps, equipment, and panel mounted controls. Submit identification number and wording for review by engineer.
- B. Designation: The name of each piece of equipment or usage shall be etched in 1/4" maximum, 1/8" minimum high letters and mounted on or adjacent to piece of equipment.
- C. Type: White core black or red Bakelite secured with epoxy glue.

2.16 MOTORS

Provide motors for all equipment furnished under Mechanical Sections unless otherwise specified. Motors shall operate using electrical characteristics as shown on the electrical drawings and as specified. Motors shall be Louis-Allis, Gould, Westinghouse, General Electric, or Emerson, except where furnished as part of packaged equipment.

Standards: Except where otherwise specified, motors shall be manufactured according to NEMA Standards. They shall be NEMA Design B, Insulation Class B or F, 40-degrees C. ambient and 40-degrees C. rise. Hermetic motors shall be manufactured according to ARI Standards. Motors 2 HP and larger shall be high efficiency, similar to Gould E plus.

- A. Sizes:
  - 1. Motors with standard NEMA Electrical characteristics shall be selected for the design brake horsepower without overload current at rated voltage.
  - 2. Motors with special electrical characteristics, such as hermetic refrigeration motors, shall be selected to produce the brake horsepower required for the specified load without overload current at rated voltage.

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- B. Enclosures: Motor enclosures shall be open drip-proof, except where otherwise specified. Motors for equipment installed where subject to weather shall be fan cooled, totally enclosed, weatherproof type.
  - C. Nameplates: Motors shall have a nameplate showing the specified nominal system voltage as nameplate rated voltage. Each motor shall be guaranteed to operate satisfactorily at the specified nominal system voltage, plus or minus 10%.

**2.17 STARTERS**

- A. Furnish all starters (except where included in motor controls centers), contractors, motor switches, and start-stop stations. Where located inside the building, starter and motor enclosures shall be NEMA type 1 general purpose, and where located outside the building, shall be NEMA type 3R except where otherwise noted on the drawings. See Electrical Division for motor control centers.
- B. Three phase motors shall be provided with magnetic across-the-line starters with overload protection on each phase. Furnish starters with hand-off-automatic selector switch and reset button in cover.
- C. Single phase motors less than 2 HP shall be provided with relays or switches with overload protection.
- D. Equipment furnished with factory installed motor starter units shall also be equipped with individual motor branch circuit protective devices interconnected on their line sides to lugs sized to receive a feeder with minimum ampacity of 125% of total connected load.
- E. Starters shall be Allen Bradley, Cutler Hammer, Square-D, General Electric, Westinghouse, Jocelyn Clark, or equal.

**2.18 STEEL EQUIPMENT BASES AND SUPPORTS:**

- A. Fabricate from steel structural shapes by welding. Where members must be removable, assemble with bolted joints.

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- B. Form corners in angle frames with joints mitered, welded, and ground smooth.
- C. Finish steel bases and supports in 2-part rust resistive oil paint system with primer and top coat to light gray color.

PART 3 - EXECUTION

3.01 SLEEVES

- A. Sleeves shall be spaced sufficient distance from adjacent walls and other sleeves so that insulation, floor, wall, and ceiling plates may be installed without cutting insulation or plates.
- B. Sleeves through slabs and outside walls below grade shall be caulked water-proof. Caulk other sleeves in floor slabs with non-shrink grout or concrete.
- C. Piping passing under column footings, or under or through wall footings, foundations or retaining walls shall be provided with a relieving arch, or an iron pipe sleeve two pipe sizes greater than the pipe passing through.
- D. Provide sleeves for piping passing through masonry walls, partitions, floors, and roofs except for cast iron piping which may be built into masonry walls and partitions.
- E. Cut wall sleeves full thickness of walls.
- F. Where pipes passing through sleeves are to be covered, size sleeves large enough to allow for full thickness covering.
- G. Omit pipe sleeves in concrete slabs on grade.
- H. Provide sleeve lay-out for slabs above grade, including roof, for approval by structural engineer and architect showing location and size before slabs are formed.

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- I. Sleeve system such as Pro-Set or equal shall be installed in accordance with manufacturer=s recommendations.
  - J. Annular space between sleeve and pipe shall be packed with approved fire stopping material.
  - K. Provide sleeves on thermally expandable piping penetrations through fire or smoke rated gypboard construction partitions. The sleeves shall extend a minimum of 3" on either side of the partition and the annular space shall be filled with a fire stopping material in such a way as to maintain a fire endurance rating equivalent to that of the adjacent wall.
  - L. Isolate non-ferrous piping from slab on grade with armaflex or equal insulation .
  - M. Piping penetrations made AFTER installation of wall shall be cored with a coring machine. Block shall not be knocked out with a hammer.

**3.02 SUPPORT OF PIPING**

- A. Support steel piping 1" and smaller on centers not more than 8' apart. Support piping larger than 1" on centers not more than 10' apart.
- B. Support copper tubing 1-1/4" or larger size not more than 10' apart. Support copper tubing in sizes 1" and smaller not more than 6' apart.
- C. Support soil, waste, and vent stacks and inside downspouts at the base by means of heavy hangers or riser clamps close to the bottom of the stack.
- D. Support each horizontal length of cast iron pipe, not counting the fitting, not exceeding 10'-0" on centers.
- E. Support all piping within 1' of each change in direction and at each branch connection.
- F. Provide pipe hangers with rods and supports proportioned to the actual size of pipe supported



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with allowance for weight of insulation and contents.

- G. Support hot and cold water plumbing piping in spaces back of plumbing fixtures with heavy duty ABS brackets and u-bolts secured to cast iron stacks.
- H. Provide insulation protectors for insulated piping supported on gang or clevis hangers.
- I. Do not penetrate exterior walls of the building below grade with support bolts.
- J. Do not run piping over or within 3'-6" of electrical switchgear or panelboards in mechanical spaces. No piping is permitted in space dedicated to electrical equipment rooms.
- K. Condensate drain piping shall be pitched in the direction of flow not less than 1/4" per foot.
- L. Provide strainer ahead of each pump suction, trap, and automatic valve.
- M. Provide unions in piping at valves and equipment connections.
  - 1. Screwed Piping - Malleable iron, ground joint, brass seated, 2" pipe size and smaller.
  - 2. Welded Piping - Flanged with same gaskets as at pipe fittings, 2-1/2" pipe size and larger.
- N. Bed body of piping underground on solid ground.
- O. Install air piping with slope of 1" fall per 40' toward receiver of blow off point.
- P. Provide vibration isolation device on first three pipe hangers from rotating mechanical equipment over one horsepower.
- Q. Vertical piping shall be supported at each floor. Riser clamp must rest firmly on floor - not on sleeve.
- R. Perforated strap hanger or similar material will not be permitted.

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3.03 PROCEDURES FOR PIPE JOINTS

A. Threaded Pipe Connections:

1. Ends of pipe shall be cleaned and reamed.
2. Joints shall be made with pipe thread lubricant suitable for service intended, applied to male threads only.

B. Soldering of Pipe:

1. Ends of pipe shall be cleaned with sand cloth or wire brush.
2. Flux shall be evenly applied to both pipe end and fittings. Flux shall be of type recommended by its manufacturer for the type of solder used. Brazing flux shall be used for solder or 1000-degrees F. or higher melting point.
3. Solder shall completely fill socket of joints. **Do not back up joints with solder dissimilar to that used in joints.**

C. Mechanically Formed Tee Connections:

1. Mechanically extracted collars shall be formed in a continuous operation consisting of drilling a pilot hole and drawing out the tube surface to form a collar having a height of not less than three times the thickness of the tube wall. The collaring device shall be fully adjustable as to insure proper tolerance and complete uniformity of the joint.
2. The joining branch tube shall be notched and dimpled in a single process so as to set the proper penetration of the branch tube into the fitting to assure a free flow joint.
3. All joints shall be brazed in accordance with the Copper Development Association Copper Tube Handbook using B-cup series filler metal. Note: Soft soldered joints will

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not be permitted.

4. All mechanically formed branch collars shall be as approved by local National Standard Plumbing Code, B.O.C.A., I.A.M.P.C., or S.B.C.C.

- D. Cast Iron Pipe - Hub and Spigot: Joint shall be firmly packed with white oakum and filled with molten lead not less than one inch (1") deep. Joints shall be well caulked. For gasketed joints, hub, spigot, and gasket manufacturer to prevent damage and facilitate joining.
- E. Cast Iron Pipe - No Hub: Couplings shall be used to join pipe in accordance with pipe manufacturer=s recommendation and shall be installed using torque wrench made for this purpose. Vent piping shall be joined by standard no-hub couplings. Soil, waste, and rainwater piping shall be joined with heavy duty, Husky or Tyler, no-hub couplings.

#### 3.04 UNDERGROUND PIPING

- A. Underground ferrous piping unless noted otherwise shall have factory applied corrosion resistant coating. Fittings and weld joints shall be coated with product specified here-in.

#### 3.05 UNIONS

- A. Provide unions at connections to valves and equipment to allow dismantling of pipe connections without cutting pipe.
- B. Flanged connections are considered as unions.

#### 3.06 REDUCERS

- A. Use eccentric reducers for all pipe size changes in horizontal straight thru piping 1 1/4" and larger.
- B. Eccentric Reducers
  1. Reducers shall be installed with flat on top in chilled water and hot water piping

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systems.

2. Reducers shall be installed with flat on bottom in steam piping.

C. Concentric reducers shall be used only in vertical piping.

### 3.07 INSTALLATION OF INSTRUMENTATION

A. Provide water pressure gauges and gauge manifolds, gauge connection points, thermometers and wells, test wells, and instrument ports in locations specified or indicated on the drawings.

B. Mount instruments in locations and positions to give accurate reading of the measured condition and to be readable from the floor. Locate pairs of instruments to allow reading of both from same point.

C. Mount instruments for reading pressure drops with taps at points for which published pressure drop data are available.

D. Locate test wells with bore more than 30-degrees above horizontal to permit retention of heat transfer material. Locate test wells at chillers to allow use of glass thermometers up to 24" long.

E. Select wells for thermometers in piping with 3-1/2" stems for 6" and smaller piping and 6" stems for 8" and larger piping, with extension necks of length to extend clear of insulation.

F. Instrument Locations:

1. Where indicated on the drawings.

G. Calibrate and adjust instruments after installation. Set up air filter gauges for clean filter pressure drop.

H. Mount pressure and temperature measuring stations in side of tee or in coupling on large pipe.

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**3.08 TESTING**

- A. All piping shall be tested to the pressure and for the period of time listed, and shall hold the specified pressures at the low point of the system for the specified length of time without perceptible loss of pressure or leakage.
1. Space Heating, Chilled Water, Hot Water, Compressed Air, Cold Water, Domestic Hot Water, and Hot Water Circulation Piping: One hundred twenty-five pounds hydrostatic pressure for two hours (125 psig - 2 hours).
  2. Soil, Waste, and Vent Piping: A water test shall be applied to the system in sections. Each opening shall be tightly plugged except the highest opening of the sections, at least the upper ten feet of the preceding section shall be retested so that all but uppermost ten feet of the system shall have been submitted to a test of not less than 10' of water. The water level shall remain constant for not less than 15 minutes; the system shall be tight at all points.
  3. Compressed Air Piping: 175 PSIG hydrostatic pressure for two hours.
  4. Gas Piping - fifty pounds of air pressure for one hour. In addition each joint and connection shall receive a soap bubble test.
  5. Correct or replace items shown by test to be defective and retest to assure tightness.

**3.09 CLEANING**

- A. All water piping shall be thoroughly flushed. All strainers and aerators shall be cleaned after flush.
- B. After cleaning, fill systems with water, vent air from piping and equipment, start pumps and verify flow.

**3.10 DISINFECTIONS OF PIPING**

- A. All domestic water supply lines shall be disinfected BEFORE THEY ARE PLACED IN OPERATION. The system shall be filled with a chlorinated water solution containing not less

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than fifty (50) parts per million of chlorine solution. Following a contact period of not less than twenty-four (24) hours, the chlorinated water shall be flushed from the system with clear water until the residual chlorine content is not greater than two-tenths (0.2) parts per million.

- B. Contractor shall submit to the Architect, in triplicate a letter of certification from an independent Testing Lab acceptable to the Georgia Department of Public Health stating that the above disinfection procedure has been completed satisfactorily.

**3.11 DIELECTRIC CONNECTIONS**

- A. Use dielectric couplings to join pipe of dissimilar metals.

**3.12 INSTALLATION OF STEEL EQUIPMENT BASES AND SUPPORTS**

- A. Establish base location, coordinate for 4" housekeeping pad under each base, anchor base to pad.
- B. Suspended Equipment
  - 1. Attach steel members to structure over suspension points on equipment.
  - 2. Install hanger rods and bolts at suspension points, attached to steel members.
  - 3. Mount equipment with rods and bolts to suspension points.
  - 4. Adjust hanger rods and bolts to make equipment level.
  - 5. Make screwed attachments secure by double-nutting.
- C. Coordinate installation of bases and supports with vibration isolation requirements where required.

**3.13 PUMP SUCTION DIFFUSERS AND STRAINERS**

- A. Contractor to furnish and install pipe support leg positioned to relieve any stress on pumps.
- B. Brass start-up strainer shall be removed after flush and reasonable running period and before system balancing procedure.
- C. Allow ample space for removal and service.

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3.14 VALVES

- A. All gate, globe, butterfly, and ball valves shall be installed with stems above the horizontal position.

3.15 AIR VENTS

- A. Automatic Air Vents shall be installed on Air Purger and as indicated on plans. Manual Air Vents shall be installed at all high points in piping, at all coils and as required for purging system whether shown or not.
- B. Automatic air vents shall be piped to drain.
- C. Install a 1/4" copper gooseneck on manual air vents.

- 3.16 Adjust pressure reducing valves serving compression tanks to maintain between 5 and 10 PSIG at highest point in the system.

3.17 VENT PIPING

- A. Provide vent piping from the relief opening of each gas pressure regulator and gas pressure switch in the boiler gas trains to a point outside the building at least 10' above finished grade, and at least 5' from any building opening. The vent connection to each regulator or switch shall be increased when 2 or more appliances have been connected so that the common vent will be equal or greater than the sum of the cross sectional areas of all individual vents involved. The common vent shall be a minimum of 3/4" size. Vents from regulators in high pressure gas piping, above 2@ psig, shall each be run independently to the exterior. Terminate vent lines with an OPW 113 flash arrestor.

END OF SECTION

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**PART 1-GENERAL**

**1.01    Scope**

- A. Division 1 of these Specifications is incorporated herein.
- B. The work covered by this division of the Specifications shall conform to all ordinances and regulations of the County, City, State and/or any Authority having jurisdiction. The work shall conform to the latest issue of Pamphlet No.54, 90A and 96 of the National Board of Fire Underwriters Building code, except where other codes exceed these requirements.

**1.02** Obtain all necessary permits and inspections required for the installation of this work and shall pay for all charges incidental thereto. Deliver to the Architect all certificates of said inspection issued by the authorities having jurisdiction.

**1.03    Equipment Installation and Workmanship:**

- A. The Architect reserves the right to direct the removal of any item which in his opinion does not present an orderly neat and good workmanship appearance, provided such items can be installed in an orderly manner by the usual methods. Such removal and replacement shall be done when written instructions are received from Architect.
- B. In no case shall any equipment be installed contradictory to the manufacture=s recommendations.

**1.04** Submit catalog data in six (6) copies for approval.

**1.05** The Contractor shall be responsible for a trouble free system in every respect for twelve (12) months after final inspection.

**1.06    Test, Adjust and Balance: (To be monitored by Architect/Engineer)**

Contractor shall test system and submit balance report with three copies to Architect/Engineer for approval. Testing company shall be member of AABC or NEBB.

- A. Report all CFM air quantities.
- B. Report test on new roof top unit.
- C. Report calibration point on controls.
- D. Report outside Air CFM.

**1.07    Guarantee:**

- A. All work furnished under the HVAC trade shall be guaranteed for a period of one year form date of acceptance thereof to be free of defects in workmanship and materials.
- B. The Contractor shall agree to replace the refrigeration compressor assembly in which defects in material or workmanship become manifest under normal conditions of use and service of a period of 5 years, whereby it fails to operate and which by examination shall be disclosed to be faulty or defective.

**PART 2-PRODUCTS**



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2.01 Air Conditioning Unit:

- A. Unit shall have factory assembled, piped, internally wired and fully charged. All units shall be designed to operate at outdoor ambient temperatures as high as 100 degrees F. Units certified by ARI Standard 210 and 270. National Rating Standard of the Air Conditioning and Refrigeration Institute. heating/Cooling units design is certified by American Gas Association (A.G.A.) specifically for outdoor applications using propane or natural gas. All cooling units are Underwriter=s Laboratories listed. All units shall be designed for indoor installation. Units have welded shell, 3600 RPM compressors.
- B. Casing: All access panels are gasketed and provided with fasteners and handles. One inch, one pound density foil-faced glass fiber insulatin is on heat exchanger section. Same composition mat-faced insulation is in evaporator section.
- C. Refrigeration Controls: Refrigeration controls include condenser fan, evaporator fan and compressor contactors, and 24 volt transformer. Safety controls include winding thermostat and compressor overloads. Cycle guard prevents unit cycling on overloads and safety controls to be reset at thermostat inside the buildng. Each circuit of the unit has a separate set of refrigeration controls.
- D. Compressor: All units have welded shell hermetic compressors, 3600 RPM. Crankcase heaters shall be required on all compressors.
- E. Evaporator Coil: Units have a 2-row coil. All coils have seamless copper tubing of 3/8" OD, mechanically bonded to heavy duty aluminum fins. Factory pressure and lead tested at 300 PSIG. Expansion valves standard.
- F. Drain Pan: Evaporator pan internally sealed insulated. Threaded drain connection in evaporator section.
- G. Condenser Coil: 5-ton units have a 2-row coil. P:rimary surface 3/8" OD seamless copper tube. The secondary surface is mechanically bonded to heavy duty aluminum fins. Factory pressure and leak tested 425 PSIG.
- H. Indoor Air Fans: Belt driven, forward curved, centrifugal type fans equipped with adjustable motor sheave standard. The motor is thermally overload protected. Permanently lubricated fan motor bearings. Motor/fan assembly completely isolated from unit with rubber mounts.
- I. Condenser Fans: Direct drive, statically and dynamically balanced propeller fans. Weather-proof fan motors UL listed for outdoor use. Units have built in thermal overload protection. Permanently lubricated motor.
- J. Heat Exchanger: Use corrosion resistant embossed, formed and seamed 18 gauge aluminum steel. Factory tested for gas leaks. Stress relieved, free floating design. Located upstream of cooling coil.

2.02 Split-System Heat Pump Units: (Open)

2.03 Indoor Section: (Open)

2.04 REFRIGERATION PIPING

- A. Refrigeration piping shall be seamless copper tubing, dehydrated type AACR,@ with wrought

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copper long radius elbows, made up with sweat type silver solder joints. Vibration eliminator pipes where recommended by the compressor manufacturer or where required to prevent transmission of vibration shall be of the bellows type, with bradied bronze wier protection. Refrigerant pipe design and sizes shall be in strict conformance to the recommendations of the equipment manufacturer, and to the Equipment Standards of the Air Conditioning and Refrigeration Institute, Inc., except that Freon suction risers shall be for a gas velocity not less than 2,000 feet per minute.

- B. Oil lift traps shall be required at the base of all vertical riser pipes or as recommended by the manufacturer.
- C. Refrigeration pipe insulation: The suction piping shall be insulated with 3/4" thick Armstrong Armiflex, foam rubber pipe insulation.

**2.05    REFRIGERANT AND OIL**

- A. The entire refrigerant charge shall be of the correct amount of pounds, as recommended by the system manufacturer. The Contractor shall be required to perform all pressure test, vacuum test, halide torch test, and operation test. The Contractor shall guarantee the refrigeration piping system free from leaks for one year. Any refrigeration leaks which are detected within the warranty period shall be repaired by the Contractor at no additional charge to the owner. Any refrigerant which leaks out shall be replaced at the time of repair.
- B. Each refrigeration system shall be furnished with a complete charge of lubricating oil for the compressor crankcase. The oil shall be of the type recommended by the compressor manufacturer.

**2.06    SUCTION LINE ARMAFLEX INSULATION:**

- A. Rubber Pipe Insulation: Shall be Armstrong Armaflex or approved equal condensate drain pipe-1/2" thick.  
Refrigeration Suction Pipe: 3/4" thick. As much of the insulation as possible shall be slipped on to the piping as the piping is being connected in order to keep from cutting the insulation. All butt ends and any necessary longitudinal joints shall be sealed with rubber based adhesive.

**2.07    ABOVE GROUND DUCT WORK**

- A. (A/C Ducts) All duct work supply, return and exhaust except flexible run-outs shall be galvanized steel (cross break on all sides). All duct work shall be new and securely suspended and hung as per SMACNA Manual. All duct work shall be concealed from view above ceiling. Follow good sheet metal practice as outlined Chapter 1 of 1972 ASHRAE System 1970 (Forced Air Systems).

**END OF SECTION**

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PART 1 - GENERAL

1.01 This section covers basic electrical materials and wiring, and all items of equipment not otherwise specified under other sections of the Specifications.

1.02 **APPLIANCE AND EQUIPMENT CONNECTIONS**

- A. Provide PVC insulated flexible cord sets for all cord and plug connected contract building appliances and equipment. Cords shall be sized in accordance with electrical circuits indicated on the drawings. Multiple conductor cords shall be type ASO@ cable with PVC jacket and green insulated ground conductor.

1.03 **MOTORS**

- A. Motors except where specified herein, shall be furnished under other sections of the Specifications. Confirm motor locations.
- B. Motors shall be of the voltage and phase characteristics as shown on the drawings.
- C. The horsepower ratings indicated are for guidance and do not limit the equipment size. When electrically driven equipment furnished under other sections of these Specifications differs from the contemplated design, the Contractor shall be responsible for the necessary adjustments to the wiring, disconnect devices, and branch circuit protection to accommodate the equipment installed.

1.04 **MOTOR WIRING**

- A. Furnish and install power wiring to motors and mechanical equipment. Wiring into motor or equipment terminals shall be complete with connections through associated disconnect switches, and motor starters, including branch circuit power line controlling devices.
- B. Receive, store, and install individually mounted starters and controllers for motors.
- C. Wiring shall be in conduit, with a final connection to rotating equipment made through a section of PVC jacketed flexible conduit.
- D. Multi-speed, reversible, and reduced voltage start motors shall be connected as recommended by equipment manufacturer.
- E. Motors shall be grounded as specified under AGrounding System@.

1.05 **CONTROL WIRING**

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- A. Control wiring and empty conduits for control wiring to be furnished under this section shall be furnished only to the extent indicated on the electrical drawings.
- B. Control wiring is defined as that wiring which provides connections between control circuit elements and does not provide the power circuit into motor or heating equipment terminals. Where a control device, such as push-button, thermostat, firestat, is to be installed in the branch circuit power lines, these devices shall be received, stored, and installed as indicated the drawings and called for under AMotor Wiring@ and AElectric Heaters@
- C. Coordinate the installation of branch circuit power line control devices with requirements in other sections of the Specifications.

**1.06 RATED PENETRATIONS**

- A. All rated wall and floor penetrations shall be sealed with a UL listed sealant to maintain the rating.

**PART 2 - PRODUCTS**

**2.01 PLYWOOD BACKBOARDS**

- A. Provide flame retardant plywood backboards for distribution equipment surface mounted in equipment areas such as mechanical rooms, electrical closets, and equipment rooms.
- B. Backboards shall be minimum 3/4" thick and sized to accommodate equipment indicated on the drawings.
- C. Secure backboards to the building structure and paint with two coats of fire resistant flat black Duron paint.

**2.02 DISCONNECT SWITCHES**

- A. Disconnect switches shall be quick-make, quick-break Underwriters= labeled Heavy Duty safety switches. Switch ratings shall be for the applied voltage and current.
- B. Disconnect switch enclosures:
  - 1. For indoor - NEMA 1 general purpose.
  - 2. For outdoor - NEMA 3R raintight.
- C. Manufacturers: General electric, Westinghouse, ITE, Square D.
- D. Designate with permanent labels, the maximum allowable fusing capacity for fusible switches

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that are applied with conductors rated less than the switch rating.

- E. Disconnects for 120V motors 2 HP or less shall be horsepower rated toggle switches in steel outlet boxes.

**2.02 FUSES**

- A. Install fuses in fusible protective devices.
- B. Provide NEC, dual element time-delay, or current limiting, fuses for specific applications only where indicated on the drawings.

**2.03 LABELS**

- A. Provide labels on the outside face of panelboards, switchboards, disconnect switches, motor starters, transfer switch, and contactors.
- B. Labels shall be a micarta nameplate with 2" high white letters. Nameplates shall be red on emergency equipment and black on normal equipment. Secure labels with screws or pop-rivets.

**PART 3 - EXECUTION**

**3.01 UTILITY COMPANY COORDINATION**

- A. Coordinate with the electrical Utility and verify location and orientation of service equipment and associated metering equipment.
- B. Provide and install all materials designated by the Electrical Utility to be furnished by ACustomer@. This may include but not be limited to, compression lugs for transformer secondary connection, concrete pad for serria transformer, grounding material, meter base and empty conduits for primary lines.

**3.02 BRANCH CIRCUITS**

- A. Provide dedicated neutral for any branch circuit serving dimmable lighting fixtures and copying machines.

**END OF SECTION**

## SECTION 26 05 33

### CONDUIT

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#### PART 1 - GENERAL

##### 1.01 GENERAL

- 1.01 Where the word "conduit" is used in this specification, it shall mean thick wall rigid metal conduit, rigid non-metal conduit or electrical metallic tubing. Where the words "flexible conduit" are used, it shall mean jacketed liquid-tight or unjacketed flexible metal conduit.
- 1.02 Conduits shall bear the Underwriters Laboratories listing mark.
- 1.03 Conduits for branch circuit wiring shall be 2" or larger.

#### PART 2 -- PRODUCTS

##### 2.01 TUBULAR CONDUIT

- A. Non-metallic conduit shall be Schedule 40, 90-degrees C. Rated polyvinyl chloride, UL listed for underground burial.
- B. Metallic conduit shall be galvanized steel.
- C. Intermediate Metal Conduit (IMC) may be used in lieu of rigid metal conduit. IMC shall be hot-dipped galvanized steel manufactured in accordance with UL Standard #6 or # 1242.
- D. Flexible Conduit:
1. Flexible conduit shall be a minimum length of 8" and at least six times the trade diameter for conduit 1/2" or larger.
  2. Flexible conduit for connections to lighting fixtures shall be 3/8" diameter and minimum 48" and a maximum 72" in length, and shall be non-jacketed with a continuous strip cold rolled galvanized steel core.
  3. Liquidtight flexible conduit shall be a minimum 2" diameter.
  4. Liquidtight and non-jacketed flexible conduit shall be manufactured by Electric-Flex, Anaconda or Flexi-guard.
- E. Steel conduit shall be manufactured by Republic, Wheatland, Allied, Triangle, or Steel duct.
- F. PVC conduit shall be manufactured by Carlon, Sedco, Context, or Certainteed.

##### 2.02 FITTINGS

- A. Where electrical metallic tubing is used indoors, connectors and couplings shall be steel thread set screw. Make all joint connections tight for a continuous low impedance ground return.
- B. Where electrical metallic tubing is used outdoors, connectors and couplings shall be UL listed rain tight, steel compression type. Connectors shall be complete with insulated throats.
- C. Cast or split threadless couplings are not acceptable.

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- D. Connectors and couplings for rigid steel or intermediate metal conduit shall be steel threaded type.
  - E. Conduit passing through concrete or masonry walls underground shall be complete with watertight wall seal gland fittings, OZ type WSK. Ground bushings shall be OZ type BLG.
  - F. Connectors and couplings shall be manufactured by Thomas and Betts, Efcor, Racor, Appleton, Steel City, ETP, or Erickson.
  - G. Flexible Conduit:
    - 1. Connectors for flexible conduits shall be UL listed with insulated throats.
    - 2. Connectors for liquidtight conduit shall be compression type, made of steel and provided with O-ring. Connectors metal ferrule shall provide positive ground circuit continuity.
    - 3. Connectors for non-jacketed flexible conduit shall be squeeze-type and made of malleable iron.
    - 4. Flexible conduit connectors manufacturers shall be Racor, Appleton, Efcor, Thomas and Betts, or Ideal.
  - H. Where a conduit run crosses a structural expansion joint, provide expansion fitting, OZ type DX. The expansions fitting shall be electrically continuous or the contractor shall install a bonding jumper across it.

### PART 3 - EXECUTION

#### 3.01 WORKMANSHIP

- A. Conduit bends and offsets shall be made with conduit hickey or conduit bending machine. Crushed or deformed conduits shall not be installed.
- B. Exposed conduits shall be run parallel or at right angles to adjacent walls.
- C. Prevent lodgement of plaster, dirt or trash in conduits, boxes and fittings.
- D. Store conduit in racks above ground.

#### 3.02 INSTALLATION

- A. Provide unjacketed flexible conduit connections to lighting fixtures in lift-out type ceiling to an outlet box located above the ceiling.
- B. Provide liquidtight flexible conduit for short final connections (3' maximum) to rotating or vibrating machinery and equipment including transformers.
- C. Provide non-metallic (PVC) conduits for outdoor lighting branch circuit wiring, secondary service conductors between power company transformer and main switchboard, and at other location where specifically indicated on drawings.

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- D. Concealed Conduit:
  - 1. Conduits shall be concealed except as noted or shown otherwise.
  - 2. Concealed conduits shall be above ceiling, in building walls, or in floor construction.
  - 3. Concealed conduits in building walls shall be installed vertically except when:
    - a. The wall is or framing stud and gypsum board construction, and
    - b. Adjacent outlet boxes are within 10' of each other; and
    - c. Outlets are in common wall (do not turn corners; and
    - d. Removing the horizontal conduit will not affect upstream or downstream devices (run shall be a dead end), and
    - e. The total horizontal run does not exceed 20',
    - f. A maximum of four horizontally connected outlet boxes are on each vertical conduit.
- DI. Conduit risers in masonry-block walls shall be installed before walls are built and run vertically in walls. Where existing block walls are to have conduit, run in furring space before gypsum board is installed.
- DII. Conduits shall be grounded as provided by the National Electrical Code and these specifications. Conduits installed below grade or with non-galvanized male threads shall have threads painted with ALPS Zinc Rich@.
- DIII. Conduits installed underground or in on-grade floor slabs shall be rigid metal conduit with threaded couplings, except where otherwise noted.
- DIV. Rigid metal conduit shall be used for all runs likely to be subject to physical injury.
- DV. Feeder circuits (panelboards, motor control centers, etc.) shall be rigid metal conduit or intermediate metal conduit.
- DVI. Conduits run above ceilings shall be supported from the building structure, independent of ceiling system support. Install on bottom of bar joists or structures where practical, otherwise secure conduit above ceilings with threaded rods and hangers. Parallel groups of conduit may be supported from a trapeze channel with each conduit secured to the channel with a spring clip device. Supports shall occur on minimum 10 foot centers and within 3 feet of an outlet or junction box.
- DVII. Feeders and branch circuit conduits installed exposed shall be supported from the bar joist or structure. Suspension below bar joist and structure or channel supports is acceptable up to 12"; greater suspension must be approved by the Architect.
- DVIII. Conduits installed underground outside building foundations shall be a minimum of 24" below finished grade and shall be encased in 3000 psi concrete envelope with 4" coverage; except conduits for outdoor lighting branch circuit wiring, telephone service, and cable television



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- service, which shall be run unencased direct buried at a minimum depth of 30" below finished grade.
- M. Conduit larger than 3/4" installed in ground floor concrete slab shall be covered top and bottom with a minimum of two (2) inches of concrete. Thicken slab by depressing waterproof barrier on gravel to provide minimum cover, or run conduit under the concrete slab and encased in concrete.
  - N. Conduit installed in structural concrete slabs shall be in accordance with the requirement of the ACI 318-63 Building Code Requirement for Reinforced Concrete@ publications.
  - O. Exposed conduits below 8' shall be rigid metal conduit. Support conduits on the ceiling or wall by means of the two screw galvanized clamps or trapeze hangers.
  - P. Empty conduits shall have a Polyolefin line (200 lbs. Strength) pulled into conduit.
  - Q. Seal unused conduit ends with plastic or metal caps.
  - R. Elevated slab floor penetrations for conduit shall be provided with sleeves. Sleeves shall extend approximately one inch above finished floor slab and sealed tightly with fire safe insulation.
  - S. PVC conduit shall not be installed indoors.

END OF SECTION

**SECTION 27 30 00  
VOICE AND DATA COMMUNICATION CABLING**

**CARTER WATKINS ASSOCIATES ARCHITECTS, INC.**  
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**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 furnishing and installing all materials and providing all labor and supervision pertaining to Cat 6 Voice/Data Wiring support systems cabling, devices, devices, plates, equipment racks, active components and associated components.
- B. QUALITY CRITERIA AND STANDARDS
  - 1. Voice/Data support equipment shall comply with applicable UL, NEC, and NEMA standards and requirements and shall be UL-listed and labeled.

**PART 2 – PRODUCTS**

**2.1 MATERIALS:**

- A. Station jacks, faceplates, and associated components; furnished and installed by Contractor.
- B. Patch panels and type 110/66 punch-down blocks: furnished and installed by Contractor.
- C. Voice/data workstation cable: furnished and installed by Contractor. Run Cat 6 cabling from all outlets shown back to the Elec/IT Room.
- D. Associated materials and components:
  - 1. Backboard: Telephone and data backboards shall be  $\frac{3}{4}$ " thick B\_D INT-DEPA plywood. Mount D finish toward wall. The backboard shall be divided so that each zone (voice/data) is clearly separated and marked from one another. The backboard shall be painted with 2 coats of fire-resistant white paint. Unless specifically indicated on the drawings, minimum backboard size shall be 4' x 8'.
  - 2. Cable support: Provide Cable Treys for all above-ceiling wiring in hallways and J-hooks from hallways to outlet drops. Size as required – submit shop drawings for approval.

**PART 3 – EXECUTION**

**3.1 INSTALLATION:**

- A. Installation of Voice/Data workstation cable, station jacks, faceplates, and associated components, rack equipment, patch panels, and punchdown blocks is by the Contractor.

**END OF SECTION**

SECTION 28 31 00  
FIRE ALARM SYSTEM

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PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install a complete, new, non-proprietary fire alarm system as described herein and as shown on the plans. The system shall be wired , connected, and left in first class operating condition.

B. The products and installation shall conform to the requirements set forth in the following standards:

1. NFPA 70 (including article 760), current Edition
2. NFPA 72, current Edition
3. NFPA 101, current Edition
4. The IBC International Building Code and IFC International Fire Code as amended and adopted by the local authority.
5. State of Georgia Rules of Safety Fire Commissioner.

1.02 SYSTEM ARCHITECTURE

A. The system shall consist of all elements, wiring, accessories, software, phone line connections, etc. to provide a complete, operable, system approved by the Authority Having Jurisdiction. This is to included but not be limited to:

1. A complete microprocessor-based non-coded, closed circuit, completely supervised zone indicating fire alarm system to monitor hardwired inputs from normally open contact devices.
2. Capacity (provide numbers as required for devices shown on plans):
  - a. Eight to thirty-two initiating device circuits with two spares.
  - b. Two to six indicating appliance circuits with two spares.
  - c. Five to fifteen amp power output.

B. Circuit styles shall be NFPA 72 styles as follows:

1. Indicating device circuits: Style B.
2. Indicating appliance circuits: Style Y.

1.03 SYSTEM INITIATION

A. System initiation shall occur when any initiating device is in alarm or manual pull station activated.

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- B. Supervisory Condition: An alarm condition for any of the following items shall be considered a supervisory condition which is second priority to a fire alarm condition:
  - C. Fire Alarm Condition: An alarm condition for any initiation device except those listed in the previous paragraph shall be considered a fire alarm condition.

**1.04 AUTOMATIC EMERGENCY CONTROLS**

- A. If a duct-mounted smoke detector is in the alarm condition, the air handling unit serving that duct shall be shutdown and all smoke dampers in that air handling unit system shall close. Provide control modules at locations required. The wiring distance from the control module to the AHU control or damper controls shall not exceed three feet.

**1.05 OCCUPANT NOTIFICATION**

- A. Upon system initiation, all evacuation signals shall activate. all requirements per NFPA and local authority.

**1.06 FIRE DEPARTMENT NOTIFICATION**

- A. Upon system initiation, a fire alarm condition shall cause activation of a supervised signal to notify the local fire department. Coordinate with the fire department and provide the proper city connection circuit whether reverse polarity, local energy, parallel telephone, shunt, or dry contact connection.

**1.07 INTEGRITY MONITORING**

- A. The system shall contain independently monitored initiation circuits. A fault in any one circuit shall not affect any other circuit. The alarm activation of any point shall not prevent the subsequent alarm operation of any other point.
- B. There shall be independently fused indicating appliance circuits for alarm notification devices. Disarrangement circuits of any circuit shall not affect the operation of other circuits.
- C. Ground fault detection on all circuits on either the plus or minus side.
- D. All alarm initiating wiring, signal circuit wiring, annunciator wiring and, control wiring to remote relays

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shall be monitored for integrity.

- E. The incoming power to the system shall be monitored for power failure. A green Apower on@ LED shall be displayed continuously while incoming power is present.
- F. The Control Panel Modules shall be electrically monitored for module placement and LED burnout.
- G. Any failure in wiring integrity or system disarrangement as described above shall be considered a trouble condition which is third priority.

**1.08 CONTROL PANEL OPERATOR=S INTERFACE**

- A. A control panel shall include an operator's interface for annunciation and manual controls. The interface shall consist of a LED adjacent to each message.
- B. Under normal condition, the operator's interface shall display a APOWER ON@ message.
- C. Should an abnormal condition be detected, the appropriate LED (zone number or trouble) shall flash. The panel audible signal shall pulse for fire alarm and sound steadily for trouble conditions.
- D. Alarm Silencing: Should the AAlarm Silence@ button be pressed, all audible fire alarm notification appliances shall be deactivated. An override of the automatic fire alarm notification shall be annunciated as a trouble condition.
- E. System Reset
  - 1. The ASystem Reset@ button shall be used to return the system to its normal state after all abnormal conditions have been remedied.
  - 2. Should an abnormal state continue to exist, then the associated notification and control functions shall not reset.
- F. Function Keys, Display of System Detail Information
  - 1. System shall include panel mounted volt meters and ammeters for monitoring battery voltage and battery charge current.
  - 2. The system shall have provisions for disabling and enabling all circuits individually for maintenance or testing purposes. Additionally, when disabled, ground isolation shall be implemented to aid in location and repair of any ground fault conditions.
- G. System Trouble Reminder: Should a trouble condition be present within the system and the audible trouble signal silenced, the trouble signal shall resound at preprogrammed time intervals to act as a reminder that the fire alarm system is not 100% operational. Both the time interval and the trouble reminder signal shall be programmable to suit the owner=s application.

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**1.09 WALK TEST**

- A. The system shall be capable of being tested by one person. The panel shall automatically reset itself after the alarm.
- B. The momentary disconnection of an initiating or notification appliance circuit shall be a trouble condition. The panel shall automatically reset itself.
- C. Any momentary opening of an initiating or notification appliances circuit wiring shall cause the alarm notification appliances to sound for 4 seconds to indicate the trouble condition.

**1.10 QUALITY ASSURANCE**

- A. Acceptable manufacturers shall be regularly engaged in the manufacture of fire alarm systems at least 5 years and have a fully equipped, factory trained and authorized service organization within 100 miles. Acceptable Manufacturers: Simplex, EST, Pyrotronics.
- B. The equipment supplier shall be regularly engaged in the manufacturer or shall be the manufacturer's authorized representative and shall provide personnel factory trained and approved for installation, certification, final connections, programming, testing, training, warranty service, and maintenance.
- C. Service availability: The supplier shall have on hand sufficient spare parts inventory, necessary test and diagnostic equipment, and have a fully equipped service organization capable of guaranteeing response time within 8 hours of emergency service calls, 24 hours a day, 7 days a week to service completed systems. Emergency shall be required for significant loss of coverage.
- D. All materials, installation, and workmanship shall be guaranteed against defects for (1) one year from the start up and beneficial use of the system or installation certification, whichever is later.
- E. The contractor shall guarantee all wiring and raceways to be free from mechanical or electrical defects for one (1) year from the startup and beneficial use of the system or installation certification, whichever is later.
- F. Warranty service for the equipment shall be provided by the manufacture's factory trained representative during normal working hours, Monday through Friday excluding holidays at no cost to the owner.

**1.11 SUBMITTALS**

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A. In compliance with Division 1 of these specifications, submit for Architect's review, six (6) copies of the following product data, shop drawings, and other submittals:

1. Specification data sheets on each individual system component clearly indicating the equipment to be supplied and its type, size, rating, style, catalog number, and appearance.
2. Complete one-line diagrams showing all equipment and the size, type, and number of all conductors. (Point to Point Diagrams)
3. Installation manuals including roughing in drawings, details, and conductor terminations for each component.
4. Calculations clearly showing the required amount of battery reserve needed and the proposed battery capacity.
5. Copies of certificates from the manufacturer indicating supplier's status as an authorized representative and listing employees factory-trained for the services.
6. Voltage drop calculations on worst case notification and signaling line circuits and acceptable limits.

**PART 2 - PRODUCTS**

**2.01 GENERAL REQUIREMENTS**

A. All equipment shall be new and unused. All components and systems shall be designed for uninterrupted duty. All equipment, materials, devices, and other facilities shall be the best suited for the intended use and shall be the standard product of a single manufacturer.

B. Provide electrical products which have been listed by Underwriters Laboratories, INC., which comply with NEMA Standards, and which are approved by Factory Mutual Research. All control equipment is to be listed under U.L. Category UOJZ as a single control unit. A partial listing shall not be acceptable. The systems controls shall be U.L. listed for Power Limited Applications power NEC 760.

**2.02 COMPONENTS**

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A. All Control Panels shall have at least the following components/capacities:

1. Twenty-four volt dc power sufficient to operate the control panel and its circuits during alarm and still maintain at least two amps of spare capacity. The control panel shall receive 120VAC power (as noted on the drawings) from two (2) dedicated circuits.
2. The system shall be provided with sufficient battery capacity to operate the entire system upon loss of normal 120 VAC power in a normal supervisory mode for a period of twenty-four (24) hours with five (5) minutes of alarm operation at the end of this period. The system shall automatically transfer to the standby batteries upon power failure. All battery charging and recharging operations shall be automatic. Battery chargers shall be capable of recharging all batteries to on percent capacity in forty-eight hours. Battery, battery charger, ammeter and voltmeter shall be panel mounted.
3. All circuits requiring system operating power shall be 24VDC, power limited in compliance with NFPA 70 Article 725, and shall be individually fused at the control panel.
4. Signaling line circuit interface modules (cards).
5. Indicating appliance circuits as required for the quantity of notification appliances to be served from the panel. The circuits shall be the reversing polarity type.
6. Operating interface panel.

## 2.03 MANUAL STATIONS

- A. The station body shall be so constructed that chips and scratches will not expose metal. All stations shall be mastered keyed with the control equipment. When actuated, the condition shall be visually apparent.

## 2.04 DETECTORS

- A. Sensor Bases: Sensor bases shall allow interchangeability of sensor heads: photoelectric, ionization, and heat-type sensors. Sensor bases shall supervise proper head installation. Heads shall be secured with an anti-tamper device. Sensor bases shall provide a remote LED output and have an integral LED for power-on, alarm, and trouble indication. Sensor bases shall have a magnetically-



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operated functional test feature.

B. Sensor Heads: The sensors shall be sealed against rear air-flow entry.

1. Area smoke sensors shall be photoelectric-type. Have insect screens. The photo chamber shall be field cleanable. Nominal detector sensitivity shall be 1.4% per foot obscuration with a range of 1% to 1.84%. Regardless of sensitivity settings, the detector=s stability shall be unaffected by high velocity. No radioactive materials shall be used.
2. Duct-mounted smoke sensors shall have photoelectric-type smoke sensors, sampling tubes as required, and auxiliary alarm relay with two Aform C@ contacts. The duct-mounted smoke detectors shall be furnished under this section, installed under Division 15, and connected to the fire alarm circuit under this section. The photo chamber shall be field cleanable. Each duct-mounted smoke detector shall be perform properly with the air velocity present at its location.
3. Heat sensors shall be self restoring.

C. The heat detector in the elevator machine rooms and elevator shafts shall be non-restorable type and shall be the fixed temperature type set to activate at 135-degrees F. The detectors shall include two N.O. 120V contacts. Provide two (2) spare heat detector heads.

D. Remote Device Alarm Indicator:

1. For each duct-type smoke detector located in concealed spaces, provide and install a remote light emitting diode (LED) indicator, complete with stainless steel faceplate and label, 24V DC operation.
2. For above ceiling devices, remote LED=s shall be recessed in wall 12" below ceiling.
3. Labels shall be engraved micarta with white 1" letters on red background, and shall identify the HVAC system associated with the detector, as well as the location.
4. Where a concealed detector is located annunciated by a graphic annunciator, the remote device alarm indicator is not required.

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**2.05 EVACUATION SIGNALS**

- A. Evacuation signals shall mount to a standard four inch square outlet box and shall be mounted in a semi-flush manner on the wall.
- B. Horns shall be nominally provide a minimum 87dB at 10 feet as measured per U.L standard 464.
- C. ADA visual evacuation units shall be Xenon strobe type, minimum 75 candela intensity, with 1-3Hz flash rate and 0.2 sec. flash duration.

**2.06 EXTINGUISHING SYSTEM SWITCHES**

- A. Sprinkler Flow, Pressure, and Tamper Switches: Flow, pressure and tamper switches are provided under another division. Provide monitor module for each switch and connect thereto.
- B. Tamper switches (N/C contacts) shall not be connected to initiating device circuits with N.O. initiating devices.

**2.07 FIRE SHUTTER CONTROLS**

- A. Where shutters in rated in walls are normally held open, provide ceiling mounted smoke detector(s) and control module for shutter controls. Provide 120 volt power supply to each shutter, and connect to shutter release device through the Form-C contacts, per shutter manufacturer=s instructions.

**2.08 REMOTE ANNUNCIATION**

- A. Provide and install a flush or semi-flush wall-mounted remote annunciator to identify device and floor of alarm incident.

**2.09 WIRING**

- A. All wiring shall be marked in accordance with NEC 760-23, approved by local authorities having jurisdiction for the purpose, and shall be as recommended by the fire alarm system manufacturer.

**2.10 CIRCUIT TRANSIENT PROTECTION**

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- A. Provide circuit transient protection on all wiring including shields which enters or leaves a building. The protector shall use MOV technology and comply with U.L. # 497B requirements. The protector shall fit on a standard 4" square, 2-1/8" deep electrical box.

2.11 MISCELLANEOUS

- A. All other equipment as necessary.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The system shall be installed by a licensed Electrical Contractor.
- B. Deliver each piece of equipment in durable shipping cartons. Maintain cartons through shipping, storage and handling as required to prevent damage and eliminate dirt and moisture. Store cartons inside and protected from weather. Where necessary to store outside, elevate well above grade and enclose with durable waterproof wrapping.
- C. The entire system shall be installed in a workmanlike manner in accordance with the fire alarm system manufacturer's manuals and wiring diagrams. The contractor shall provide all conduit, wiring, outlet boxes, junction boxes, cabinets and similar equipment necessary for the complete installation. Wiring shall be installed in dedicated conduit throughout.
- D. Connections to water flow, pressure and tamper switches shall be through liquid-tight conduit.
- E. All fire alarm system junction boxes above ceilings shall be painted red.
- F. All penetrations of floor slabs and fire walls, shall be fire stopped in accordance with all local fire codes.
- G. End of Line Resistors shall be provided as directed by the manufacturer.
- H. Conceal wiring except in mechanical rooms and areas where other conduit and piping are exposed. Fasten flexible conductors bridging cabinet doors and protect against abrasion. Tie and support conductors neatly.

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- I. Number code or color code conductors, appropriately and permanently, for identification and servicing of the system.
- J. A circuit transient protector shall be installed as close as practical to the point at which wiring enters or leaves a building. Install a maximum 28', No. 12 AWG grounding conductor in 1/2" conduit in as straight a line as possible to an effectively grounded cold water pipe or effectively grounded building steel.
- K. The contractor shall comply with all requirements for permits and tests, shall provide all certificates and shall pay all costs for the same.
- L. The manufacturer's local authorized representative shall provide supervision of system installation and provide final system panel connections.
- M. Programming and final adjustment shall be performed by the manufacturer's authorized representative, who shall have full responsibility for debugging and proper calibration of each component in the entire system.
- N. Upon completion of the installation of the fire alarm system equipment, the electrical contractor shall provide to the owner, with a copy to the manufacturer's representative, a signed written statement, substantially as follows:

The undersigned, having engaged as the contractor on the Fayette County Animal Shelter, confirms the fire alarm system equipment installed is in agreement with the wiring diagrams and written instructions and directions provided.

**3.02 ACCEPTANCE TESTING**

- A. After the system installation is complete, notify the authority having jurisdiction of the acceptance testing to be performed as required in the following paragraphs. Coordinate the scheduling of the acceptance testing with the authority having jurisdiction and the owner. At their discretion, acceptance testing shall be performed in the presence of an owner=s representative and the authority jurisdiction. During all acceptance testing, make available the as-built drawings and manufacturer=s installation instructions. The manufacturer=s authorized shall perform the acceptance testing. Correct all deficiencies found in

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testing and re-test the corrected wiring or component.

- B. Wiring Installation Testing: Provide testing of the installation wiring as required by NFPA 72H para. 2-2, Installation Testing.
- C. Wiring Installation Certification: After completion of the wiring installation testing, complete parts 1 and 3 through 9 of a certificate conforming to NFPA 72 figure 2-2.2. Submit a preliminary copy of the completed parts to the owner and the authority having jurisdiction.
- D. System Operation Testing: Provide testing of system operation as required by NFPA 72H para. 2-3, System Testing. Where application of heat would destroy any detector, it may be manually activated.
- E. Certification of System Operation: After completion of the system operation testing, complete part 2 of the certificate conforming to NFPA 72 figure 2-2.3.

**3.03 CLOSEOUT SUBMITTALS**

- A. Deliver the following to the Owner within thirty (30) days after Owner receives installation certificate.
  - 1. Final specification data sheets, calculations, certificates, and installation programming, operation, and maintenance manuals in suitable binders for maintenance use.
  - 2. As-built drawings including final floor plans and point-to-point diagrams showing all device and splice locations.
  - 3. The application program listing for the system as installed at the time of acceptance.
  - 4. Name, address and telephone number of the authorized factory representative.
  - 5. Final copy of system certification conforming to NFPA 72 figure 2-2.2. Mount on the inside of the central station panel door.

**3.04 TRAINING**

- A. After submitting the installation certificate, the manufacturer's authorized representative shall provide the services of the manufacturer's trained representative for a period of eight (8) hours, during

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normal business hours, to instruct the owner=s designated personnel on the operation and routine maintenance of the system.

**3.05 TESTING AND MAINTENANCE CONTRACT PROPOSAL**

**A.** Testing and Maintenance Contract Proposal: The supplier shall propose a contract, including costs, for the testing and maintenance service described below for each of the first two years following the installation (The first year is the warranty year). Acceptance of the testing and maintenance contract is optional to the owner.

1. The testing and maintenance contract shall include the following services for the entire building:
  - a. Quarterly tests as required by the Joint Commission. (Operational test for one device per initiating circuit per quarter.)
  - b. Inspection, testing, maintenance, cleaning, and record keeping as required by NFPA Standards 72, 72E, 72G, and 72H as applicable, including annual operating test for each smoke detector per NFPA 72E para. 8-3.41. Provide quarterly operational testing of 25% of all smoke detectors such that by year=s end all detectors have been tested.
  - c. Other services recommended by the manufacturer.
  - d. Replacement of all defective parts in the system.
  - e. Testing and maintenance shall be provided by the manufacturer=s factory-trained representative during normal working hours, Monday through Friday, excluding holidays.
2. Propose an indexed or fixed percentage increase to renew the testing and maintenance Contract each year after the second year up to ten (10) years total. If an indexed percentage increase is chosen, indicate to what index the increase would be tied (For example: [Atlantaservice@gmail.com](mailto:Atlantaservice@gmail.com)).
3. Propose an additional labor cost for emergency service. Emergency service is required for the loss of coverage.

END OF SECTION

## SECTION 31 10 00

### SITE CLEARING

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#### SECTION 311000 – SITE CLEARING

#### 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. Removal and disposal of surface debris.
  - 2. Removal and disposal of paving, curbs, gutters, fences, posts, or other structures indicated on the drawings.
  - 3. Site clearing and disposal of plant life and grass.
  - 4. Removal and disposal of trees and shrubs.
  - 5. Removal and disposal of root system of trees and shrubs.
  - 6. Topsoil excavation and stockpiling.
- C. Related Sections:
  - 1. Division 01 Section "General Requirements."
  - 2. Division 01 Section "Special Procedures."
  - 3. Division 31 Section "Backfill."

##### 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Tree Paint: Include product label and manufacturer's application instructions specific to the Project.

##### 1.3 QUALITY ASSURANCE

- A. Prior to drilling or excavation, obtain a "Permit to Penetrate or Excavate Surfaces at LBNL" in accordance with Division 01 Section "Special Procedures." Remove and dispose of paving, curbs, gutters, fences, posts, and structures indicated for removal on the Drawings.
- B. Conform to applicable codes and local, state and federal regulations for disposal of debris and use of herbicides. Burning of debris, lumber or scrap will not be permitted.
- C. Coordinate clearing work with the Project Manager.
- D. Obtain the University's approval prior to removal of tree branches. Removal of tree branches shall be under the supervision of the University.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

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- A. Tree Paint: Non-toxic, commercial grade, suitable for application on fresh cut branches.

#### PART 3 - EXECUTION

##### 3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to **requirements of authorities having jurisdiction and sediment and erosion control Drawings.**
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

##### 3.2 PREPARATION

- A. Verify that existing plant life designated to remain, is tagged or identified.
- B. Sawcut paving, curbs gutters and other structures between portion to remain and portion to be removed.

##### 3.3 PROTECTION

- A. Locate, identify, and protect from damage utilities indicated to remain.
- B. Protect trees, plant growth, and features indicated to remain.
- C. Protect from damage or displacement bench marks and existing structures indicated to remain.

##### 3.4 CLEARING

- A. Clear areas required for access to site and execution of the Work.
- B. Remove paving, curbs, and gutters, fences, posts, or structures indicated on the Drawings.
- C. Remove trees and shrubs indicated.
  - 1. In areas to be filled and under structures and roads, remove stumps, and main root system to a depth of not less than 2 feet (0.6 m) below the original ground surface.
  - 2. Fill depressions made by grubbing with structural backfill to the original surface in accordance with Division 31 Section "Earthwork" unless further excavation is required.
- D. Clear undergrowth and dead wood without disturbing subsoil.
- E. Apply herbicide approved by the County to remaining stumps to inhibit growth.
- F. Cut tree branches in conflict with the construction close to the bole in a workmanlike manner. Remove other tree branches in such a manner that the tree will present a balanced appearance. Scars resulting from the removal of branches shall be treated with a heavy coat of tree paint.



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- G. Remove debris, rock, and extracted plant life from site.

3.5 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded.
- B. Stockpile in area designated on site to depth not exceeding 8 feet (2.5 m) and protect from erosion. Remove excess topsoil not being reused from site.

END OF SECTION 311000

## SECTION 31 20 00

### EARTHWORK

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#### PART 1 - GENERAL

##### 1.1 SUMMARY

Site disturbance is to be limited to LESS THAN 5,000 square feet. This includes any required trenching; building addition; and any other impervious surfaces added. Refer to Site Plan.

##### A. Section Includes:

1. Earth moving and excavation
2. Utilities trenching
3. Grading
4. Backfilling
5. Compacting
6. All erosion and sediment control.
7. All other work shown in the contract documents.

##### 1.2 SUBMITTALS

##### A. Test Reports: The following tests are to be performed by a licensed Testing Agency that shall be paid and obtained by the Owner. Contractor shall be responsible for coordinating meetings with testing company at site for each test as appropriate.

1. Analysis of soil materials, whether procured on or off site, and including fill, backfill, and borrow materials.
2. Verification of each flooring sub-grade.
3. In-place density test reports.
4. Moisture-density relationship test reports.
5. Compressive strength or bearing test reports.

##### B. Construction schedules are specified in another Division-1 Section.

##### 1.3 QUALITY ASSURANCE

##### A. Testing Laboratory Services:

1. Owner to secure and pay for the services of a qualified, independent geotechnical engineer to classify existing soil materials, to recommend and to classify proposed borrow materials when necessary, to verify compliance of materials with specified requirements, and to perform required field and laboratory testing.

##### 1.4 SITE CONDITIONS

##### A. Traffic: Do not interfere with or close public ways without permission of governing authorities. Do not interfere with adjacent private facilities.

##### B. Site Utilities:

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1. Advise Utility companies of excavation activities before starting excavations. Locate and identify Utilities passing through work area before starting work.
  2. If underground utilities are encountered in locations other than indicated, immediately advise utility owners before proceeding. Amend project record documents to show actual location.
  3. Protect existing utilities indicated to remain.
  4. Do not interrupt existing utilities without advance notice to and written approval from the Owner.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Where sufficient approved materials are not available from required excavations on site, obtain and pay for materials from approved sources off site without charge to the Owner.
- B. For each soil material proposed for use as fill or backfill, whether obtained on or off site, testing laboratory shall classify soil material, develop Proctor curve, and perform any other test required.
- C. Obtain approval of the architect for each soil material.
- D. Backfill and Fill Materials: Materials classified as satisfactory.
- E. Satisfactory Soil Material (ASTM D 2487): Free of stones larger than 2 inches in any dimension, trash, debris, organic material, other objectionable material and classified as follows:
  1. GW (well-graded gravel).
  2. GP (poorly graded gravel).
  3. GM (silty gravel).
  4. GC (clayey gravel).
  5. SW (well-graded sand).
  6. SP (poorly graded sand).
  7. SM (silty sand).
  8. SC (clayey sand).
- F. Unsatisfactory Soil Material (ASTM D 2487):
  1. CL (lean clay).
  2. ML (silt).
  3. OL (organic clay).
  4. OL (organic silt).
  5. CH (fat clay).
  6. MH (elastic silt).
  7. OH (organic clay).
  8. OH (organic silt).
  9. PT (peat).
- G. Capillary Water Barrier: Clean, crushed rock of gravel or uncrushed gravel; 100 percent passing a 12 inch sieve; not more than 2 percent passing a No. 4 sieve.
- H. Subbase Material: Well-graded, clean, sound, durable particles of crushed stone, crushed blast furnace slab, or crushed gravel, and screening. Obtain the architect's approval of source, quality, and gradation.

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#### 2.2 PLASTIC WARNING TAPE

- A. Acid and alkali resistant polyethylene film specifically manufactured for marking and identifying underground utilities.
  - 1. Minimum width, 2 inches; minimum thickness, 4 mils.
  - 2. Metallic core encased in protective jacket against corrosion and detectable by metal detector when tape is buried 1 foot deep.
  - 3. Continuous printed inscription shall describe utility. Tape color:
    - A. Electric: Red
    - B. Gas: Yellow
    - C. Telephone: Orange

### PART THREE - EXECUTION

#### 3.1 PREPARATION

- A. Protection: Provide markers indicating limits of work and clear identification of items and areas requiring protection.
- B. Provide barricades, warning signs, and warning lights around open excavations as necessary to prevent injury to persons.
- C. The contractor is solely responsible for determining the potential for injury to persons and damage to property.
  - 1. Where such potential is present, take appropriate protective measures.
  - 2. Protect persons from injury and protect existing and new improvements from damage caused directly or indirectly by construction operations.
- D. Do not allow excavation subgrades and soil at foundations to be subjected to freezing temperatures or frost. Provide protective insulating materials as necessary. Should prepared, compacted subgrades be damaged by freezing, remove soil materials to the depth required by the architect and replace and recompact in conformance with specified requirements.

#### 3.2 EROSION CONTROL

- A. To the maximum extent practicable, prevent erosion or displacement of soils and discharge of soil-bearing water runoff to adjacent properties and waterways.
- B. Provide erosion control during the entire project in accordance with applicable regulations.

#### 3.3 DEWATERING

- A. Do not allow surface or ground water to flow into or accumulate in excavations.
- B. Do not allow water to flow in an uncontrolled fashion across the project site or to erode slopes or to undermine foundations. Do not allow water to be diverted onto adjacent properties. Arrange

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excavation operations so as to provide continual and effective drainage of excavations.

- C. Provide and maintain temporary diversion ditches, dikes, and grading as necessary; do not use trench excavations for this purpose. When required by surface or subsurface water conditions, provide sumps, wellpoints, French drains, pumps, and other control measures necessary to keep excavations free of water. When existence of ground water near or above final excavation level is indicated or suspected, provide control measures prior to excavating to water level and maintain water level continuously below working level.

#### 3.4 EXCAVATION

- A. General: Excavation includes the removal of any materials necessary to achieve the required subgrade elevations and includes reuse or disposal of such materials.
- B. Unnecessary Excavation: The expense of excavation of materials outside of limits indicated or Ordered in writing by the architect and the correction thereof to the satisfaction of the architect shall be borne by the contractor.
  - 1. Unnecessary excavation under footings: Either deepen footings to bear on actual subgrade elevation without changing top elevations or place concrete fill up to required elevation, as required by the architect.
  - 2. Unnecessary excavation other than under footings: Either place compacted fill or otherwise correct conditions, as required by the architect.
- C. Approval of Subgrade: Notify the architect when required elevations have been reached.
  - 1. When required by the architect due to the unforeseen presence of unsatisfactory materials or other factors, perform additional excavation and replace with approved compacted fill material in accordance with the architect's instructions.
  - 2. Payment for unforeseen additional work will be made in accordance with established unit prices or, if none, in accordance with provisions for changes in the work. No payment will be made for correction of subgrades improperly protected against damage from freeze-thaw or accumulation of water, or for correction of otherwise defective subgrades.
- D. Excavation Stabilizations: Slope faces of excavations to maintain stability in compliance with requirements of governing authorities. Do not use shoring and bracing where faces can be slopes.
- E. Excavation for Structures:
  - 1. Excavate beyond footings and foundations so as to allow proper construction and inspections of concrete form work and other materials. Excavate to the required elevation.
    - a. Tolerance: Plus or minus 0.10 foot.
- F. Excavation for Footings and Foundations:
  - 1. Delay excavation to final grade and final compaction until just before concrete is to be placed.
  - 2. Remove any loose or sloughed material and adjust excavations to conform to required lines, grades, and tolerances and to form a suitable bearing surface. Do not disturb bottom of

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### EARTHWORK

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completed excavations.

#### G. Excavation for Trenches:

1. Unless otherwise required, begin trenching, utility installation, and backfilling at lowest portion of the utility line, working toward highest portion of line.
2. Required trench width: Excavate accurately to provide not less than 6 or more than 9 inches of clearance on each side of pipes and conduits, unless otherwise indicated.
  - A. Where indicated trench widths are exceeded, redesign, stronger pipe, or special installation procedures may be required by the architect at no additional cost to the Owner.
3. Unless otherwise indicated, trench walls for piping shall be vertical from trench bottom to one foot above top of pipe or to top elevations of initial backfill, whichever is higher.
4. Excavate trenches to the depths necessary to achieve required flow lines and invert elevations and to prevent freezing of liquids or frost heave during winter.
5. Dig trenches to depths indicated.
6. Trench bottoms: Unless otherwise indicated, excavate and shape trench bottoms as follows:
  - A. Support pipes and conduit up to 5 inches diameter on smooth, accurately graded subgrade. Shape surface by hand to provide continuous support on undisturbed soil for bell and body of pipe and joints, fittings, and body of conduit.
  - B. Support pipes and conduit 6 or more inches diameter on 4 inches of approved subbase material. Place and carefully compact additional layer of subbase material of depth required to support pipe haunches. Shape surface to provide continuous support for bell and body of pipe and joints, fittings, and body of conduit.

#### 3.5 STORAGE

- A. Stockpile materials to be used for filling and backfilling, including excavated materials classified as satisfactory soil materials, at locations indicated or as directed. Stockpile in a manner to freely drain surface water; cover if necessary to prevent wind-blown dust.
  1. Store soil materials without intermixing. Protect from contamination with other soils or debris.

#### 3.6 PLASTIC WARNING TAPE

- A. Install tape directly above utilities, 4 to 6 inches below finished grade.

#### 3.7 FILLING AND BACKFILLING

- A. Preparation: Backfill excavations as soon as practicable. Complete the following operations before backfilling:
  1. Inspections and acceptance of below-grade construction.
  2. Inspection, testing, and approval of underground utilities.
  3. Surveying of underground utilities for record documents.

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### EARTHWORK

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4. Concrete form work removal.
  5. Removal of loose material, muck, debris, and trash from excavation.
  6. Installation of temporary or permanent horizontal bracing for structures to receive backfill.
  7. Backfilling near footings, general: Where trenches occur underneath of footing, or where trench bottoms occur below and within 18 inches horizontally of footing bottoms, backfill trench with concrete to top of footing and up to 4 feet perpendicularly from each face of footing.

- B. Installation: Place approved soil materials in layers to required elevations.
  1. Do not place material on muddy or frozen surfaces or on surfaces containing frost.
- C. Installation: Place fill materials to required elevations in lifts of required depth. Provide fill materials beneath each area as indicated.
  1. Planted areas: Satisfactory soil materials.
  2. Building slabs: Capillary water barrier material.
  3. Piping/Conduit: Subbase materials where indicated; otherwise use satisfactory soil materials.

#### 3.8 BUILDING SLAB AREAS

- A. Place fill or backfill lifts such that compaction true to grade and level is accomplished with a minimum of surface disturbance and segregation or degradation of materials. Maintain grade control and cross section by means of line and grade stakes. Maintain moisture content within prescribed limits during placing and compacting.
- B. When the total thickness of materials to be placed is less than the maximum lift thickness permitted, place material in a single lift. When the total thickness of materials to be placed is greater than the maximum lift thickness permitted, place materials in two or more lifts or uniform thickness with no lifts less than 3 inches in thickness.
  1. Capillary water barrier: Under slabs on grade, place capillary water barrier material directly on subgrade, shape surface to within the required tolerances and compact.

#### 3.9 COMPACTION

- A. Place materials used in backfilling and filling in layers not exceeding loose depths as follows:
  1. Heavy equipment compaction: 8 inches.
  2. Hand-operated tampers: 4 inches.
- B. Place materials simultaneously on opposite sides of walls, small structures, utilities lines, etc. to avoid displacement or over stressing.
- C. In-Place Density Requirements: Compact soil to not less than the values given below, expressed as a percentage of maximum density at optimum moisture content.
  1. Unpaved areas: top 6 inches of subgrade and subsequent lifts:
    - a. 90 percent.
  2. Building Slabs and Structures: Top 12 inches of subgrade and subsequent lifts:
    - a. 95 percent.
  3. Utility Trenches: Compact backfill and fill materials to in-place density specified for applicable

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### EARTHWORK

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area of trench, but in no case less than 90 percent.

- D. Moisture Control: During compaction, control moisture of subgrades and subsequent lifts to within tolerances from optimum moisture content as recommended by testing laboratory. Wet surface with water when additional moisture is required. Aerate soil to aid in drying or replace soil when excessive moisture is present.

#### 3.10 GRADING

- A. General: Smooth grade to a uniform surface that complies with compaction requirements and required lines, grades, and cross sections and is free from irregular surface changes.
- B. Provide smooth transition between existing adjacent grades and changes grades. Cut out soft spots, fill low spots, and cut down high spots to conform to required surface tolerances.
- C. Slope grades to direct water away from structures and to prevent ponding. Finish subgrade to required elevations within the following tolerance:
  - 1. Unpaved areas: Plus or minus 0.10 foot.
  - 2. Inside building lines: 2 inch as measured with a 10-foot straightedge.

#### 3.11 FIELD QUALITY CONTROL

- A. Testing Laboratory Services: Provide timely notice to testing laboratory. Do not proceed with construction until testing of each subgrade and lift of fill or backfill has been performed and required inspections and approvals have been obtained.
- B. Maximum Density at Optimum Moisture Content: Determine in accordance with ASTM D 1557.
  - 1. For each subgrade, fill, and backfill, material, perform one moisture-density relationship test for each 1500 cubic yards, or fraction thereof, of material used.
- C. In-place Density Tests: ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2922 (nuclear method), as applicable.
  - 1. When ASTM D 2922 is used, check and adjust calibration curves using ASTM D 1556 only. ASTM D 3017 shall be performed to measure water content of soil at the time in-place density tests are conducted. Calibrate density and moisture gages at the start of testing on each type of material encountered and at intervals as directed.
- D. Footing Subgrades: Test footing subgrades to determine bearing capacity of each soil stratum encountered. At the option of The architect, visual inspection of subsequent similar subgrades and comparison with tested strata may be allowed.
- E. Areas under Slabs and Pavements: Conduct not less than one in-place density test of subgrade and one in-place density test of each compacted fill or backfill layer for every 1000 square feet of overlying paved area, but in no case less than 3 tests per lift.
- F. Trench Backfill: Conduct not less than 2 in-place density tests per lift per trench.
- G. If testing service reports indicate that subgrade or fills are below specified density, scarify or remove and replace to the required depth., recompact, and retest at no cost to the Owner.



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3.12 **MAINTENANCE**

- A. Completed Areas: Protect from damage by pedestrian or vehicular traffic, freezing, erosion, and contamination with foreign materials.
  - 1. Repair and re-establish grades to specified tolerances in settled, eroded or rutted areas.
- B. Damaged Areas: Where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction and whether due to subsequent construction operations or weather conditions, restore materials to required conditions: Scarify or remove and replace to the required density before continuing construction.
- C. Correction: Should settling occur within the project correction period, remove finished surfacing, add additional approved material, compact material, and reconstruct surfacing. Construct surfacing to match and blend in with adjacent surfacing as nearly as possible.

2.13 **DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Stockpile or spread any excess satisfactory soil in location on site as directed by the Architect.
- B. Stockpile or spread any unsatisfactory soil in location on site as directed by Architect.
- C. Remove any trash, debris, and other materials not required for use on the project and legally dispose of it off the site. Disposal area shall not be within sight of nor with 2 mile of the site.
- D. Disposal of excess soil can occur on adjacent County land as directed by the County.

**END OF SECTION**

## SECTION 31 23 19

### DEWATERING

CARTER WATKINS ASSOCIATES ARCHITECTS, INC.

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#### SECTION 312319 - DEWATERING

##### 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 construction dewatering.
- B. Related Sections include the following:
  - 1. Division 1 Section for "Temporary Facilities."
  - 2. Division 31 Section "Earthwork" for excavating, backfilling, site grading and for site utilities.

###### 1.3 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: **Design**, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.
  - 1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
  - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
  - 3. Accomplish dewatering without damaging existing buildings adjacent to excavation.
  - 4. Remove dewatering system if no longer needed.

###### 1.4 SUBMITTALS

- A. Shop Drawings for Information: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.
  - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
  - 2. Include a written report outlining control procedures to be adopted if dewatering problems arise.

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### DEWATERING

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3. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

B. Qualification Data: For **Installer and professional engineer**.

C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

D. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.

1. Note locations and capping depth of wells and well points.

E. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

#### 1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Coordination."

#### 1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical report **referenced** elsewhere in the Project Manual. (Attachment 1)

C. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect

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### DEWATERING

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if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

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

#### PART 3 - EXECUTION

##### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
  - 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
  - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

##### 3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

## SECTION 31 23 19

### DEWATERING

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- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 1. Maintain piezometric water level a minimum of 60 inches (1500 mm) below surface of excavation.
- DI. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- DII. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
  - 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.
- DIII. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

#### 3.3 OBSERVATION WELLS

- A. Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated and additional observation wells as may be required by authorities having jurisdiction.
- B. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
- C. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. Suspend construction activities in areas where observation wells are not functioning properly until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
  - 1. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

**END OF SECTION 31 23 19**

SECTION 31 31 16  
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SECTION 31 31 16 - TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following for termite control:
  - 1. Soil treatment.

1.3 DEFINITIONS

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest control operator.

1.4 SUBMITTALS

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.

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- 5. Dilutions, methods, volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.
- E. Bait Station System Application Report: Submit report for Owner's records information, including the following as applicable:
- 1. Location of areas and sites conducive to termite feeding and activity.
  - 2. Plan drawing showing number and locations of bait stations.
  - 3. Plan drawing showing number and locations of monitoring stations and bait stations.
  - 4. Dated report for each monitoring and inspection occurrence indicating level of termite activity, procedure, and treatment applied before time of Substantial Completion.
  - 5. Brand name and manufacturer of termiticide.
  - 6. Quantities of termite bait used.
- F. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- B. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is an experienced installer who employs workers trained and approved by bait station system manufacturer to install manufacturer's products.
- C. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

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- B. Install bait station system after construction, including landscaping, is completed.

1.8 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- C. Warranty Period: Three years from date of Substantial Completion.
- D. Warranty Period: Five years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:



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1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
  2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
  3. Bayer Corp.; Garden & Professional Care.
  4. DowElanco.
  5. FMC Corp.; Pest Control Specialties.
  6. Zeneca Professional Products.

2.2 BAIT STATION SYSTEM

- A. General: Provide bait stations and, if applicable, monitoring stations, according to manufacturer's EPA-Registered Label for product, manufacturer's written instructions, and the following:
  1. Provide number of stations, based on the dimensions of building perimeter indicated on Drawings, according to manufacturer's written instructions.
  2. Comply with manufacturer's written instructions for termite management system. Provide not less than one cluster of stations per 20 linear feet (6 linear meters), based on the linear dimensions of building perimeter indicated on Drawings, consisting of not less than three stations per cluster.
- B. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, the following:
- C. Product: Subject to compliance with requirements, provide the following product:
  1. Hexaflumuron: Sentricon System, Recruit II; DowElanco.
  2. Hydramethylnon: Subterfuge; American Cyanamid Co., Agricultural Products Group, Specialty Products Department.
  3. Sulfluramid: Systematic Termite Control, FirstLine GT; FMC Corp., Pest Control Specialties.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.
  - B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.
  - C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
  - 1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  - 3. Crawlspace: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
  - 4. Masonry: Treat voids.
  - 5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

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- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
  - C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
  - D. Post warning signs in areas of application.
  - E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

3.5 INSTALLING BAIT STATION SYSTEMS

- A. Place bait stations and, if applicable, monitoring stations, according to the EPA-Registered Label for the product and manufacturer's written instructions, in areas that are conducive to termite feeding and activity, as follows:
  - 1. Conducive sites and locations indicated on Drawings.
  - 2. In and around infested trees and stumps.
  - 3. In mulch beds.
  - 4. Where wood directly contacts soil.
  - 5. Areas of high soil moisture.
  - 6. Near irrigation sprinkler heads.
  - 7. Each area where roof drainage system, including downspouts and scuppers, drains to soil.
  - 8. Along driplines of roof overhangs without gutters.
  - 9. Where condensate lines from mechanical equipment drip or drain to soil.
  - 10. At plumbing penetrations through ground-supported slabs.
  - 11. Other sites and locations as determined by the PCO.
- B. Inspect and service stations from time of their application until completion of the time period established by continuing service agreement, according to the EPA-Registered Label for the product and manufacturer's written instructions for termite management system and bait products.
  - 1. Service Frequency: Inspect monitoring stations not less than once every three months.
- C. Inspect and service stations from time of their application until completion of the time period established by continuing service agreement, according to the EPA-Registered Label for the product and manufacturer's written instructions for termite bait products.
  - 1. Service Frequency: For supplementary and preventive treatment, inspect not less than once every three months.

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**END OF SECTION 313116**

## SECTION 32 03 00

### PLANTS

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## SECTION 320300 - PLANTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Plants.
2. Tree-watering devices.
3. Landscape edgings.

#### 1.2 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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- B. Samples of each type of mulch.

1.5 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.7 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  - 1. Pesticide Applicator: State licensed, commercial.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bare-root stock plants within **24 hours** of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.
- B. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- C. Handle planting stock by root ball.
- D. Store bulbs, corms, and tubers in a dry place at **60 to 65 deg F (16 to 18 deg C)** until planting.

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- E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

#### 1.9 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
    - b. Structural failures including plantings falling or blowing over.
  - 2. Warranty Periods: From date of **Substantial Completion**.
    - a. Trees, Shrubs, Vines, and Ornamental Grasses: **12** months.
    - b. Ground Covers, Biennials, Perennials, and Other Plants: **12** months.
    - c. Annuals: **Three** months.

## PART 2 - PRODUCTS

#### 2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. **Annuals and Biennials:** Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery **and that are in bud but not yet in bloom**.

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## 2.2 FERTILIZERS

- A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
  - 1. Size: **5-gram** tablets.
  - 2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

## 2.3 MULCHES

- A. Organic Mulch: **Ground or shredded bark.**
- B. Mineral Mulch: **Rounded riverbed gravel or smooth-faced stone.**
  - 1. Size Range: **1-1/2 inches (38 mm) maximum.**
  - 2. Color: **Uniform tan-beige color range acceptable to Architect. Readily available natural gravel color range.**

## 2.4 WEED-CONTROL BARRIERS

- A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, **3 oz./sq. yd. (101g/sq. m)** minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, **4.8 oz./sq. yd. (162 g/sq. m).**

## 2.5 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.



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## 2.6 LANDSCAPE EDGINGS

- A. Plastic Edging: Standard black polyethylene or vinyl edging, **V-lipped bottom, horizontally grooved**, extruded in standard lengths, with **9-inch (225-mm) plastic** stakes.

1. Edging Size: **0.07 inch (1.8 mm) thick by 5 inches (125 mm) deep**.

## 2.7 TREE-WATERING DEVICES

- A. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over an extended time period; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.

# PART 3 - EXECUTION

## 3.1 PLANTING AREA ESTABLISHMENT

- A. General: Prepare planting area for soil placement and mix planting soil into area.
- B. Placing Planting Soil: **Blend planting soil in place**.
- C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

## 3.2 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
- Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
  - Excavate approximately three times as wide as ball diameter.
  - Excavate at least **12 inches (300 mm)** wider than root spread and deep enough to accommodate vertical roots for bare-root stock.

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4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.

- B. Backfill Soil: Subsoil and topsoil removed from excavations **may** be used as backfill soil unless otherwise indicated.

#### 3.3 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set each plant plumb and in center of planting pit or trench with root flare **1 inch (25 mm) above** adjacent finish grades.
  1. Backfill: Planting soil **For trees, use excavated soil for backfill.**
  2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
  3. **Balled and Potted and Container-Grown** Stock: Carefully remove root ball from container without damaging root ball or plant.
  4. Fabric Bag-Grown Stock: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
  5. Bare-Root Stock: Support stem of each plant and spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working. Carefully work backfill around roots by hand. Bring roots into close contact with the soil.
  6. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
  7. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about **1 inch (25 mm)** from root tips; do not place tablets in bottom of the hole.
    - a. Bare-Root Stock: Place tablets beside soil-covered roots; do not place tablets touching the roots.
    - b. Quantity: **As indicated on Drawings.**

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8. Continue backfilling process. Water again after placing and tamping final layer of soil.

- D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

#### 3.4 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

#### 3.5 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines **18 inches (450 mm) apart** in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

#### 3.6 PLANTING AREA MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of **6 inches (150 mm)** and secure seams with galvanized pins.

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B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees **and Treelike Shrubs** in Turf Areas: Apply **mineral** mulch ring of **3-inch (75-mm)** average thickness, with **24-inch (600-mm)** radius around trunks or stems. Do not place mulch within **3 inches (75 mm)** of trunks or stems.
2. **Mineral Mulch** in Planting Areas: **3-inch (75-mm)** over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within **3 inches (75 mm)** of trunks or stems.

#### 3.7 INSTALLATION OF EDGING

- A. Plastic Edging: Install plastic edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately **36 inches (900 mm)** apart, driven through upper base grooves or V-lip of edging.

#### 3.8 INSTALLATION OF SLOW-RELEASE WATERING DEVICE

- A. Provide one device for each tree.

#### 3.9 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

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- F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.10 MAINTENANCE SERVICE

- A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
1. Maintenance Period for Trees and Shrubs: **12** months from date of **planting completion.**
  2. Maintenance Period for Ground Cover and Other Plants: **Six** months from date of **planting completion.**

END OF SECTION 320300

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**SECTION 323113 - CHAIN-LINK FENCING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Chain-Link Fences: Vinyl-coated dark green or black.
  - 2. Gates: **swinging pairs and single gates.**
  - 3. Gates: rolling (sliding), power operated 16 foot wide gate
- B. Related Section s include the following:
  - 1. Division 2 Section "Earthwork" for site excavation, fill, and backfill where chain-link fences and gates are located.
  - 2. Division 3 Section "**Concrete Work.**"
  - 3. Division 16 Sections for electrical service and connections for motor operators, controls, limit and disconnect switches, and safety features and for system disconnect switches.
- C. Allowances: Furnish the following under the allowances indicated as specified in Division 1 Section "Allowances":
  - 1. See Section 01 21 13
- D. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Provide chain-link fences and gates capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Minimum Post Size and Maximum Spacing for Wind Velocity Pressure: Determine based on mesh size and pattern specified, and on the following minimum design wind pressures and according to CLFMI WLG 2445:
    - a. Wind Speed: **80 mph (129 km/h)**
    - b. Fence Height: **4 feet, 6 feet and 9 feet**

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c. Line Post Group: **IA, ASTM F 1043, Schedule 40 steel pipe**

d. Wind Exposure Category: **B**

2. Determine minimum post size, group, and section according to ASTM F 1043 for framework up to 4 feet, 6 feet and 9 feet high, and post spacing not to exceed 8 feet (3 m).

- B. Lightning Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.

#### **1.4 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
1. Fence and gate posts, rails, and fittings.
  2. Chain-link fabric, reinforcements, and attachments.
  3. Gates and hardware.
  4. Gate operators, including operating instructions.
  5. Accessories: None
  6. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. Shop Drawings: Show locations of fences, gates, posts, rails, tension wires, details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.
1. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
  2. Wiring Diagrams: Power and control wiring and **access-control** features.
  3. For installed products indicated to comply with design loads, include structural analysis data **signed and sealed by the qualified professional engineer responsible for their preparation.**
- C. Samples for Initial Selection: Manufacturer's color charts or **6-inch (150-mm)** lengths of actual units showing the full range of colors available for components with factory-applied color finishes.
- D. Samples for Verification: For each type of chain-link fence and gate indicated.
1. Polymer-coated steel wire (for fabric) in **6-inch (150-mm)** lengths.
  2. Polymer coating, in **6-inch (150-mm)** lengths on shapes for **posts, rails, wires, and gate framing and on full-sized units for accessories.**
- E. Product Certificates: For each type of chain-link fence, and gate, signed by product manufacturer.

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1. Strength test results for framing according to ASTM F 1043.
- F. Qualification Data: For Installer.
- G. Field quality-control test reports.
- H. Maintenance Data: For the following to include in maintenance manuals:
  1. Polymer finishes.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
  1. Engineering Responsibility: Preparation of data for chain-link fences and gates, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
  1. Testing Agency's Field Supervisor: Person currently certified according to NETA ETT, or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

**1.6 PROJECT CONDITIONS**

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.
- B. Interruption of Existing Utility Service: Do not interrupt utility services to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  1. Notify Architect no fewer than **two** days in advance of proposed interruption of utility services.
  2. Do not proceed with interruption of utility services without Architect's written permission.



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**PART 2 - PRODUCTS**

**2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Chain-Link Fences and Gates:
    - a.

**2.2 CHAIN-LINK FENCE FABRIC**

- A. General: **6 foot high fence and rolling gate.** Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with ASTM A 392, CLFMI CLF 2445, and requirements indicated below:
  - 1. Steel Wire Fabric: **Polymer-coated** wire with a diameter of **0.148 inch (3.76 mm)**
    - a. Mesh Size: **2 inches (50 mm)**
    - b. Weight of Aluminum Coating: ASTM A 491, Type I, **0.35 oz./sq. ft. (107 g/sq. m)**
    - c. Weight of Metallic (Zinc) Coating: ASTM A 392, Type II, Class **2**, **2.0 oz./sq. ft. (610 g/sq. m)** with zinc coating applied **before** weaving.
    - d. Weight of Zn-5-Al-MM Aluminum-Mischmetal Alloy Coating: ASTM F 1345, Type III, Class **2**, **1.0 oz./sq. ft. (305 g/sq. m)**.
    - e. Polymer Coating: ASTM D 668, Class **1** over metallic-coated steel wire.
      - 1) Color: **Dark Green or Black**, complying with ASTM F 934.
    - f. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
  - 2. Selvage: **Knuckled at both selvages.**

**2.3 FENCE FRAMING**

- A. Posts and Rails: Comply with ASTM F 1043 for framing, ASTM F 1083 for Group IC round pipe, and the following:
  - 1. Group: **IC, round steel pipe, yield strength 50,000 psi (345 MPa).** Verify with conditions.
  - 2. Fence Height: per drawings.. .

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3. Strength Requirement: **Light** industrial according to ASTM F 1043.
  4. Post Diameter and Thickness: According to **ASTM F 1083**.
  5. Post Size and Thickness: **According to ASTM F 1043**. Verify with Site conditions and heights.
    - a. Top Rail: **1.25 by 1.63 inches (32 by 41 mm)**.
    - b. Line Post: **2.375 inches (60 mm)**.
    - c. End, Corner and Pull Post: **3.5 by 1.5 inches (89 by 38 mm)**.
    - d. Gate Post: **4-inch (102-mm) diameter, 8.65-lb/ft. (12.88-kg/m) weight**.
    - e. Horizontal-Slide Gate Post: **According to ASTM F 1184**.
      - 1) Openings up to **12 Feet (3.7 m)**: Steel post, **2.875-inch (73-mm) diameter**, and **4.64-lb/ft. (6.91-kg/m) weight**.
      - 2) Openings Wider Than **12 Feet (3.7 m)**: Steel post, **4-inch (102-mm) diameter**, and **8.65-lb/ft. (12.88-kg/m) weight**.
      - 3) Guide posts for Class 1 horizontal-slide gates equal the gate post height, 1 size smaller, but weight is not less than **3.11 lb/ft. (4.63 kg/m)**; installed adjacent to gate post to permit gate to slide in space between.
  6. Coating for Steel Framing:
    - a. Metallic Coating:
      - 1) Type A, consisting of not less than minimum **2.0-oz./sq. ft. (0.61-kg/sq. m)** average zinc coating per ASTM A 123/A 123M or **4.0-oz./sq. ft. (1.22-kg/sq. m)** zinc coating per ASTM A 653/A 653M.
      - 2) Type B, zinc with organic overcoat, consisting of a minimum of **0.9 oz./sq. ft. (0.27 kg/sq. m)** of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
      - 3) External, Type B, zinc with organic overcoat, consisting of a minimum of **0.9 oz./sq. ft. (0.27 kg/sq. m)** of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than **0.3-mil- (0.0076-mm-)** thick, zinc pigmented coating.
      - 4) Type C, Zn-5-Al-MM alloy, consisting of not less than **1.8-oz./sq. ft. (0.55-kg/sq. m)** coating.
      - 5) Coatings: Any coating above.
    - b. Provide Polymer coating over metallic coating.

**2.5 TENSION WIRE**

- A. General: Provide horizontal tension wire at the following locations:
  1. Location: Extended along **bottom** of fence fabric.
- B. Metallic-Coated Steel Wire: **0.177-inch- (4.5-mm-)** diameter, marcelled tension wire complying with ASTM A 817, ASTM A 824, and the following:

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1. Metallic Coating: Type by **electrolytic** process, with the following minimum coating weight:
    - a. Matching chain-link fabric coating weight.
  2. Metallic Coating: Type III, Zn-5-Al-MM alloy with the following minimum coating weight:
    - a. Matching chain-link fabric coating weight.
  - C. Aluminum Wire: **0.192-inch- (4.88-mm-)** diameter tension wire, mill finished, complying with **ASTM B 211 (ASTM B211M)**, Alloy 6061-T94 with **50,000-psi (344-MPa)** minimum tensile strength.

**2.6 INDUSTRIAL GATES**

- A. General: Comply with ASTM F 900 for **single** gate types.
  1. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1043 and ASTM F 1083 for materials and protective coatings.
  2. Metal Pipe and Tubing: Aluminum. Comply with ASTM B 429 and ASTM F 1043 for materials and protective coatings.
- B. Frames and Bracing: Fabricate members from **round galvanized steel** tubing with outside dimension and weight according to ASTM F 900 and the following:
  1. Gate Fabric Height: **2 inches (50 mm) less than adjacent fence height as indicated.**
  2. Leaf Width: **As indicated.**
  3. Frame Members:
    - a. Tubular **Steel 2 inches (50 mm) rectangular.**
- C. Frame Corner Construction:
  1. **Welded or assembled with corner fittings and 5/16-inch- (7.9-mm-) diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider].**
- D. Extended Gate Posts and Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame **12 inches (300 mm)]** as required to attach barbed **wire tape** assemblies.
- E. ELECTRIC OPERATOR: Provide Liftmaster CSL24U High Traffic Commercial Slide Gate Operator.
  - A. Gate Operators: LiftMaster CSL24U Commercial High Traffic DC Slide Gate Operator.
    1. LiftMaster CSL24U Slide Gate Operator.
    2. Compliance: UL Listed. Compliant to the UL 325, UL 991 and CSA C22.2 No. 247 standards.

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- a. This model is intended for use in Class I, II, III and IV vehicular slide gate applications.
  - 3. Monitored Safety Inputs: 3 inputs per board (main board and expansion board) totaling 6 inputs with any combination of up to:
    - a. Main Board:
      - 1) 1 Monitored Close Photo Eye input
      - 2) 1 Monitored Open Photo Eye input
      - 3) 1 Monitored Open Safety Edge or Open Photo Eye input
    - b. Expansion Board
      - 1) 2 Monitored Safety Edge or Photo Eye inputs (selectable for Open or Close).
      - 2) 1 Monitored Photo Eye input (selectable for Open or Close).
    - c. 8 Monitored edges available when Transceiver is added.
  - 4. Electrical Power Requirements:
    - a. 115V AC, single phase
  - 5. Motor: 24V DC, with soft start/stop operation.
    - a. Duty cycle: Continuous duty.
  - 6. Capacity: 50-foot (15200 mm) gate at 1,500 pounds (680 kg).
  - 7. Recommended Cycles per Day: Continuous duty.
  - 8. Gate Travel Speed: 12 inches (304 mm) per second.
  - 9. Warranty: 5 years for commercial applications, 7 years for single-home applications.
  - 10. Wormgear Reduction: Commercial oil bath gearbox with 10:1 wormgear reduction running in synthetic oil bath.
  - 11. Battery Backup: Power Management system draws 14.8 mA when gate is idle with remote controls programmed. Provides 208 cycles on Battery Backup with two 7 Ah batteries or 1179 cycles with two 33 Ah batteries.
  - 12. Standby Time: Provides up to 24 days of standby power in the event of a power loss with two 7 Ah batteries or 105 days with two 33 Ah batteries (excluding accessories).
  - 13. Solar Capable: See daily solar cycle chart.
  - 14. Accessory Electrical Power Requirements: 24V DC 500 mA output, switched and unswitched power.
  - 15. Chassis: Constructed with 1/4 inch (6mm) gold zinc-plated steel for rust prevention.
  - 16. Cover: High-density, UV-resistant polycarbonate two-piece cover.
  - 17. Internet Connectivity: MyQ Technology
    - a. 902 to 928 MHz
    - b. 50-channel FHSS (Frequency Hopping Spread Spectrum).
    - c. LiftMaster 828LM Internet Gateway enables monitoring and control of gate operators via internet-enabled smartphone, tablet or computer.
    - d. Provides two-way communication between gate operator and MyQ accessories to enable remote open, close and monitoring of gate.
  - 18. Receiver:
    - a. Security+ 2.0 3-channel on-board receiver, holds up to 50 remote controls (unlimited with use of 811LM/813LM), HomeLink compatible
    - b. Transmits 310 MHz, 315 MHz, 390 MHz.
  - 19. Inherent Reversing Sensor: Detects obstructions or increased loads. Reverses gate when closing or stops/reverses the gate when opening.

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20. Electronic Limits: Maintains accurate limit position throughout travel, even after using the manual disconnect.
21. Dual-gate operation capabilities to allow 2 separate gate operators to operate in unison at a single entrance.
22. Wireless Dual-Gate Operation:
  - a. Built-in wireless communication will operate primary and secondary operator without having to run a communication wire.
  - b. Support for Through-beam photo eye in the wireless dual-gate setup. Can attach emitter and receiver to each operator, eliminating the communication wire between them.
23. PosiLock: Automatically powers the operator and returns a gate to the closed position when gate is pushed off of its closed limits.
24. Bi-Part Delay: Selectable feature for dual-gate applications. Firmware monitors speed and position of each gate and adjusts speed as necessary to ensure both the gates close at the same time.
25. Synchronized Close: Selectable feature for dual-gate applications. Monitors the speed and position of each gate and adjusts speed as necessary to ensure both the gates close at the same time.
26. LED Diagnostic Display: Simplifies installation and troubleshooting.
27. Colored Terminal Blocks: Provides easy identification of safety and fire department inputs.
28. Programmable Auxiliary Relays: 2 programmable relays with 6 settings each
  - a. Pre-warning or gate-in-motion sounder.
  - b. Switch on/off devices at open or Close Limits or while gate is in motion..
  - c. Tamper detection if gate is pushed off Close Limit.
  - d. Cycle quantity feedback.
  - e. Red/Green light to control gate traffic.
29. Quick Close, Anti-Tailgate: Quickly secures property, preventing unauthorized access.
30. Sequenced Access Management: Capable of sequentially controlling the operator in tandem with barrier gate.
31. Plug-in Loop Detector Inputs: Programmed inputs for shadow, interrupt and exit.
32. Alarm Reset Button: Instantly resets the built-in safety alarm siren.
33. Fire Department Compliant: Selectable settings allow gate to auto open on power failure or battery depletion.
34. Surge Suppression: Industrial strength on high and low voltage outputs. Protects against lightning strikes at a 50-foot (15240 mm) radius.
35. Keyed Manual Disconnect: Simple-to-use disconnect allows gate to be operated manually and maintain limit position once re-engaged.
36. Operating Temperature Range:
  - a. Without Heater: -4 degrees F (-20 degrees C) to 140 degrees F (60 degrees C)
  - b. With Optional Heater: -40 degrees F (-40 degrees C) to 140 degrees F (60 degrees C)
37. MyQ enabled Accessories:
  - a. LiftMaster 829LM Garage and Gate Monitor: Allows remote monitoring and operation.
  - b. LiftMaster 825LM Remote Light Control: Allows remote monitoring and operation.
38. Accessories: Safety Monitoring Devices:

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- a. Monitored Photo Eyes and Wireless Edge Kits.
    - 1) LiftMaster LMRRU Reflective Photo Eyes.
  - b. Wired Monitored Edges (all require use of LMWEKITU)
    - 1) LiftMaster L50 Large Profile Monitored Edge
  - 39. Accessories: Provide the optional accessories listed below.
    - a. LiftMaster LOOPDETLN Plug-in Loop Detector
    - b. LiftMaster KPW250 – Wireless Commercial Keypad
    - c. LiftMaster 894LT 4-Button Security+ 2.0 Learning Remote Control
    - d. LiftMaster IPAC – Internet Protocol Access Control Entry System
    - e. LiftMaster MG1300 Maglock. 1,300 pound (590 kg) holding force
    - f. LiftMaster MPEL: Mounting plate for post mount
    - g. LiftMaster HTR Heater Kit

- F. All gate components, framing, etc. to receive polymer coating over metallic coating to match fence wire and framing.

**2.7 FITTINGS**

- A. General: Comply with ASTM F 626.
- B. Post and Line Caps: Provide for each post.
  - 1. Line post caps with loop to receive tension wire or top rail.
- C. Rail and Brace Ends: Attach rails securely to each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
  - 1. Top Rail Sleeves: **Pressed-steel or round-steel tubing** not less than **6 inches (152 mm)** long.
  - 2. Rail Clamps: Line and corner boulevard clamps for connecting **intermediate and bottom** rails in the fence line-to-line posts.
- E. Tension and Brace Bands: **Pressed steel**.
- F. Tension Bars: **Steel**, length not less than **2 inches (50 mm)** shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: **Steel, hot-dip galvanized after threading** rod and turnbuckle or other means of adjustment.
- H. Barbed Wire Arms: **Pressed steel or cast iron**, with clips, slots, or other means for attaching strands of barbed wire, **and means for attaching to posts, integral with post cap**; for each post, unless otherwise indicated, and as follows:
  - 1. Line posts with arms that accommodate top rail or tension wire.

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2. Corner arms at fence corner posts, unless extended posts are indicated.
  3. Type I, single slanted arm.
  4. Type II, single vertical arm.
  5. Type III, V-shaped arm.
  6. Type IV, A-shaped arm.

I. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
  - a. Hot-Dip Galvanized Steel: **0.148-inch- (3.76-mm-)** diameter wire; **galvanized coating thickness matching coating thickness of chain-link fence fabric.**
  - b. Aluminum: **ASTM B 211 (ASTM B 211M);** Alloy 1350-H19; **0.192-inch- (4.88-mm-)** diameter, mill-finished wire.

II. Finish:

1. Polymer over Metallic Coating for Pressed Steel or Cast Iron: Not less than **1.2 oz. /sq. ft. (366 g /sq. m)** zinc.

**2.8 CAST-IN-PLACE CONCRETE**

- A. Materials: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water **for ready-mixed concrete complying with ASTM C 94/C 94M.**
  1. Concrete Mixes: Normal-weight concrete **air entrained** with not less than **3000-psi (20.7- MPa)** compressive strength (28 days), **3-inch (75-mm)** slump, and **1-inch (25-mm)** maximum size aggregate.
- B. Materials: Dry-packaged concrete mix complying with ASTM C 387 for normal-weight concrete mixed with potable water according to manufacturer's written instructions.

**2.9 GROUT AND ANCHORING CEMENT**

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

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**2.10 POLYMER FINISHES**

- A. Supplemental Color Coating: **In addition to specified metallic coatings for steel**, provide fence components with polymer coating.
- B. Metallic-Coated Steel Tension Wire: PVC-coated wire complying with ASTM F 1664, Class 1.
- C. PVC-coated wire.
- D. **Metallic-Coated Steel** Framing and Fittings: Comply with ASTM F 626 and ASTM F 1043 for polymer coating applied to exterior surfaces and, except inside cap shapes, to exposed interior surfaces.
  - 1. Polymer Coating: Not less than **10-mil- (0.254-mm-)** thick PVC finish.
- E. Color: **As selected by Architect from manufacturer's full range**, complying with ASTM F 934.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine areas and conditions, with Installer present, for compliance with requirements for **a verified survey of property lines and legal boundaries**, site clearing, earthwork, pavement work, and other conditions affecting performance.
  - 1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of **500 feet (152.5 m)** or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

**3.3 INSTALLATION, GENERAL**

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.
  - 1. Install fencing on established boundary lines inside property line.

**3.4 CHAIN-LINK FENCE INSTALLATION**



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- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts **in concrete** at indicated spacing into firm, undisturbed soil.
  - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    - a. Exposed Concrete: Extend **2 inches (50 mm)** above grade; shape and smooth to shed water.
    - b. Concealed Concrete: Top **2 inches (50 mm)** below grade to allow covering with surface material.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of **30 degrees or more**.
- D. Line Posts: Space line posts uniformly at approx. **8 feet (2.44 m)** o.c.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts.
  - 1. Locate horizontal braces at mid-height of fabric **6 feet (1.83 m)** or higher, on fences with top rail and at 2/3 fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with **0.120-inch- (3.05-mm-)** diameter hog rings of same material and finish as fabric wire, spaced a maximum of **24 inches (610 mm)** o.c. Install tension wire in locations indicated before stretching fabric.
  - 1. Top Tension Wire: Install tension wire through post cap loops.
  - 2. Bottom Tension Wire: Install tension wire within **6 inches (150 mm)** of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Bottom Rails: Install, spanning between posts.
- I. Chain-Link Fabric: Apply fabric to **outside** of enclosing framework. Leave **2 inches (50 mm)** between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

## SECTION 32 31 13 CHAIN LINK FENCING

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- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than **15 inches (380 mm)** o.c.
  - K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at 1 end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
    - 1. Maximum Spacing: Tie fabric to line posts at **12 inches (300 mm)** o.c. and to braces at **24 inches (610 mm)** o.c.
  - L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

### 3.5 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

### 3.6 FIELD QUALITY CONTROL

- A. Grounding-Resistance Testing: **Engage** a qualified independent testing and inspecting agency to perform field quality-control testing.
  - 1. Grounding-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure grounding resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural grounding resistance. Perform tests by two-point method according to IEEE 81.
  - 2. Excessive Grounding Resistance: If resistance to grounding exceeds specified value, notify Architect promptly. Include recommendations for reducing grounding resistance and a proposal to accomplish recommended work.
  - 3. Report: Prepare test reports certified by a testing agency of grounding resistance at each test location. Include observations of weather and other phenomena that may affect test results.

### 3.7 ADJUSTING

- A. Gate: Adjust gate to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

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**3.8 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's personnel to adjust, operate, and maintain gates. Refer to Division 1 Section **"Project Closeout Procedures"** and **"Demonstration and Training."**

END OF SECTION 323113

SECTION 32 92 00  
TURFS AND GRASSES

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SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding.
2. Sodding.

1.2 DEFINITIONS

- A. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- B. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.

1.4 INFORMATIONAL SUBMITTALS

- A. Certification of grass seed.
1. Certification of each seed mixture for turfgrass sod.
- B. Product certificates.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

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1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
2. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the National Association of Landscape Professionals:
  - a. Landscape Industry Certified Technician - Exterior.
  - b. Landscape Industry Certified Lawn Care Manager.
  - c. Landscape Industry Certified Lawn Care Technician.
3. Pesticide Applicator: State licensed, commercial.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

PART 2 - PRODUCTS

2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species:
  1. Quality, State Certified: State-certified seed of grass species as listed below for solar exposure.
  2. Quality, Non-State Certified: Seed of grass species as listed below for solar exposure, with not less than **85** percent germination, not less than **95** percent pure seed, and not more than **0.5** percent weed seed:
  3. Full Sun: Zoysia
  4. Sun and Partial Shade: Proportioned by weight as follows:
    - a. Provide submittal.

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5. Shade: Proportioned by weight as follows:

a. Provide submittal

C. Grass-Seed Mix: Proprietary seed mix as follows:

1. Products: Subject to compliance with requirements, provide acceptable mix for the project location. Submit for approval.

## 2.2 TURFGRASS SOD

A. Turfgrass Sod: **Certified** complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

B. Turfgrass Species: Sod of grass species as follows:

1. Full Sun: Bermuda.

2. Sun and Partial Shade::

a. Zoysia.

3. Shade:

a. Kentucky 31 Fescue.

## 2.3 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: **1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m)** of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

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2.4 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Sphagnum Peat Mulch: Partially decomposed sphagnum peat moss, finely divided or of granular texture, and with a pH range of 3.4 to 4.8.
- C. Muck Peat Mulch: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.
- D. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch (25-mm) sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

2.5 PESTICIDES

- A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 TURF AREA PREPARATION

- A. General: Prepare planting area for soil placement and mix planting soil according to acceptable standards
- B. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

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3.2 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds **5 mph (8 km/h)**.
  - 1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 2. Do not use wet seed or seed that is moldy or otherwise damaged.
  - 3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of **5 to 8 lb/1000 sq. ft. (2.3 to 3.6 kg/92.9 sq. m)**.
- C. Rake seed lightly into top **1/8 inch (3 mm)** of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of **2 tons/acre (42 kg/92.9 sq. m)** to form a continuous blanket **1-1/2 inches (38 mm)** in loose thickness over seeded areas.
  - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- E. Protect seeded areas from hot, dry weather or drying winds by applying **compost mulch** within 24-hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of **3/16 inch (4.8 mm)**, and roll surface smooth.

3.3 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
  - 1. Lay sod across slopes exceeding 1:3.
  - 2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of **1-1/2 inches (38 mm)** below sod.



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3.4 TURF MAINTENANCE

- A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
- B. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings.

3.5 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
  - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding **90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm)**.
  - 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

END OF SECTION 329200

## SECTION 33 01 01

### SEWERAGE

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#### SECTION 330101 - SEWERAGE

##### 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 sanitary sewerage outside the building.
- B. Related Sections include the following:
  - 1. Division 3 Section "Concrete Work" for concrete structures.

###### 1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. EPDM: Ethylene-propylene-diene-monomer rubber.
- C. PE: Polyethylene plastic.
- D. PVC: Polyvinyl chloride plastic.

###### 1.4 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.
- B. Force-Main Pressure Ratings: At least equal to system operating pressure, but not less than 150 psig (1035 kPa).

###### 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Stainless-steel drainage systems.
  - 2. Backwater valves and cleanouts.

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3. Manhole cover inserts.

B. Shop Drawings: Include plans, elevations, details, and attachments for the following:

1. Precast concrete manholes, including frames and covers.
2. Cast-in-place concrete manholes and other structures, including frames and covers.

C. Coordination Drawings: Show manholes and other structures, pipe sizes, locations, and elevations. Include details of underground structures and connections. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.

D. Coordination Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than **1 inch equals 50 feet (1:500)** and vertical scale of not less than **1 inch equals 5 feet (1:50)**. Indicate underground structures and pipe. Show types, sizes, materials, and elevations of other utilities crossing system piping.

E. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

F. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

#### 1.7 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

B. Locate existing structures and piping to be closed and abandoned.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

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## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Stainless-Steel Drainage Systems:
    - a. Josam Co.; Blucher-Josam Div.
  - 2. Gray-Iron Backwater Valves and Cleanouts:
    - a. Josam Co.
    - b. McWane, Inc.; Tyler Pipe; Wade Div.
    - c. Smith: Jay R. Smith Mfg. Co.
    - d. Watts Industries, Inc.; Ancon Drain Div.
    - e. Watts Industries, Inc.; Enpoco, Inc. Div.
    - f. Zurn Industries, Inc.; Hydromechanics Div.
  - 3. PVC Backwater Valves and Cleanouts:
    - a. Canplas, Inc.
    - b. IPS Corp.
    - c. NDS, Inc.
    - d. Plastic Oddities, Inc.
    - e. Sioux Chief Manufacturing Co., Inc.
  - 4. Manhole Cover Inserts:
    - a. FRW Industries, Inc.
    - b. Knutson Manufacturing Co.
    - c. Parson Environmental Products, Inc.

### 2.2 PIPING MATERIALS

- A. Refer to Part 3.3 "Piping Applications" Article for applications of pipe and fitting materials.

### 2.3 PIPES AND FITTINGS

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- A. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: ASTM A 74, gray iron, for gasketed joints.
1. Gaskets: ASTM C 564, rubber, compression type, thickness to match class of pipe.
- B. Hubless Cast-Iron Soil Pipe and Fittings: CISPI 301 or ASTM A 888, gray iron, for coupling joints.
1. Stainless-Steel Shielded Couplings: ASTM C 1277 and CISPI 310, corrugated, stainless-steel shield and clamp assembly, with ASTM C 564 rubber sealing sleeve.
  2. Stainless-Steel, Heavy-Duty Couplings: ASTM C 1277; clamp assembly with housing fabricated from stainless steel complying with ASTM A 666, Type 304; and rubber sealing gasket complying with ASTM C 564. Include housings **3 inches (76 mm)** wide in **NPS 1-1/2 to NPS 4 (DN40 to DN100)** and **4 inches (102 mm)** wide in **NPS 5 to NPS 10 (DN125 to DN250)**.
  3. Cast-Iron, Heavy-Duty Couplings: ASTM C 1277, assembly with housing of gray iron complying with **ASTM A 48 (ASTM A 48M)**, stainless-steel bolts, and rubber sealing gasket complying with ASTM C 564.
- C. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
  2. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
  3. Gaskets: AWWA C111, rubber.
- D. Stainless-Steel Drainage Pipe and Fittings: ASME A112.3.1; ASTM A 666, Type 304, stainless steel; with socket and spigot ends for gasketed joints.
1. Gaskets for **NPS 3 to NPS 6 (DN80 to DN150)**: Lip seals shaped to fit socket groove, and with plastic backup ring.
    - a. Seal Material for General Applications: EPDM, unless otherwise indicated.
    - b. Seal Material for Fluids Containing Gasoline or Oil: Nitrile-rubber compound, unless otherwise indicated.
  2. Couplings for **NPS 8 to NPS 12 (DN200 to DN300)**: Stainless steel, mechanical type, with seal.
    - a. Seal Material for General Applications: EPDM, unless otherwise indicated.
    - b. Seal Material for Fluids Containing Gasoline or Oil: Nitrile-rubber compound, unless otherwise indicated.
- E. ABS Sewer Pipe and Fittings: ASTM D 2751, for solvent-cemented or gasketed joints.
1. Wall Thickness for **NPS 3 to NPS 6 (DN80 to DN150)**: SDR 35.
  2. Wall Thickness for **NPS 8 to NPS 12 (DN200 to DN300)**: SDR 42.

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3. Gaskets: ASTM F 477, elastomeric seals.
- F. Corrugated PE Drainage Tubing: AASHTO M 252, Type S, with smooth waterway for gasketed joints.
1. Fittings: ASTM D 3034, PVC with socket ends, for gasketed joints.
  2. Gaskets: ASTM F 477, elastomeric seals.
- G. Corrugated PE Pipe: AASHTO M 294, Type S, with smooth waterway for gasketed joints.
1. Fittings **NPS 12 to NPS 15 (DN300 to DN375)**: ASTM D 3034, PVC with socket ends, for gasketed joints.
  2. Fittings **NPS 18 to NPS 24 (DN450 to DN600)**: ASTM F 1336, PVC with socket ends, for gasketed joints.
  3. Gaskets: ASTM F 477, elastomeric seals.
- H. Corrugated PE Pipe and Fittings: AASHTO M 294, Type S, with smooth waterway for coupling joints.
1. Couplings: PE sleeve with ASTM F 477, elastomeric seals.
- I. PVC Pressure Pipe: AWWA C900, Class 150, for gasketed joints.
1. PVC Pressure Fittings: AWWA C907, for gasketed joints.
  2. Gaskets for PVC Piping: ASTM F 477, elastomeric seals.
  3. Ductile-Iron, Compact Fittings: AWWA C153, for push-on joints.
  4. Gaskets for Ductile-Iron Fittings: AWWA C111, rubber.
- J. Cellular-Core PVC Pipe: ASTM F 891, Sewer and Drain Series, PS 50 minimum stiffness, for solvent-cemented joints.
1. Fittings: ASTM D 2729 or ASTM D 3034, PVC sewer pipe fittings.
- K. PVC Sewer Pipe and Fittings: According to the following:
1. PVC Sewer Pipe and Fittings, **NPS 15 (DN375)** and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.
  2. PVC Sewer Pipe and Fittings, **NPS 18 (DN450)** and Larger: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
    - a. Gaskets: ASTM F 477, elastomeric seals.

## SECTION 33 01 01

### SEWERAGE

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- L. PVC Profile Gravity Sewer Pipe and Fittings: ASTM F 794, open and closed profile, bell and spigot for gasketed joints.
    - 1. Gaskets: ASTM F 477, elastomeric seals.
  - M. Nonreinforced-Concrete Sewer Pipe and Fittings: **ASTM C 14 (ASTM C 14M)**, Class 2, for gasketed joints.
    - 1. Gaskets: **ASTM C 443 (ASTM C 443M)**, rubber.
  - N. Reinforced-Concrete Sewer Pipe and Fittings: **ASTM C 76 (ASTM C 76M)**, Class III, Wall B, for gasketed joints.
    - 1. Gaskets: **ASTM C 443 (ASTM C 443M)**, rubber.

#### 2.4 SPECIAL PIPE COUPLINGS AND FITTINGS

- A. Sleeve-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes to be joined, for nonpressure joints.
  - 1. Sleeve Material for Concrete Pipe: **ASTM C 443 (ASTM C 443M)**, rubber.
  - 2. Sleeve Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
  - 3. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
  - 4. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.
  - 5. Bands: Stainless steel, at least one at each pipe insert.
- B. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joints.
  - 1. Material for Concrete Pipe: **ASTM C 443 (ASTM C 443M)**, rubber.
  - 2. Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
  - 3. Material for Plastic Pipe: ASTM F 477, elastomeric seal.
  - 4. Material for Dissimilar Pipe: Compatible with pipe materials being joined.
- C. Pressure-Type Pipe Couplings: AWWA C219, iron-body sleeve assembly matching OD of pipes to be joined, with AWWA C111 rubber gaskets, bolts, and nuts. Include PE film, pipe encasement.
- D. Ductile-Iron, Flexible Expansion Joints: Compound fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections, rated for **250-psig (1725-kPa)** minimum working pressure and for offset and expansion indicated. Include PE film, pipe encasement.

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### SEWERAGE

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- E. Ductile-Iron Deflection Fittings: Compound coupling fitting with ball joint, flexing section, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include rating for **250-psig (1725-kPa)** minimum working pressure and for up to 15 degrees deflection. Include PE film, pipe encasement.
  - F. Ductile-Iron Expansion Joints: Three-piece assembly of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Include rating for **250-psig (1725-kPa)** minimum working pressure and for expansion indicated. Include PE film, pipe encasement.

#### 2.5 PE FILM, PIPE ENCASEMENT

- A. ASTM A 674 or AWWA C105; PE film, tube, or sheet; **8-mil (0.2-mm)** thickness.

#### 2.6 MANHOLES

- A. Normal-Traffic Precast Concrete Manholes: **ASTM C 478 (ASTM C 478M)**, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
  - 1. Diameter: **48 inches (1200 mm)** minimum, unless otherwise indicated.
  - 2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
  - 3. Base Section: **6-inch (150-mm)** minimum thickness for floor slab and **4-inch (100-mm)** minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
  - 4. Riser Sections: **4-inch (100-mm)** minimum thickness, and lengths to provide depth indicated.
  - 5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  - 6. Gaskets: **ASTM C 443 (ASTM C 443M)**, rubber.
  - 7. Grade Rings: Include two or three reinforced-concrete rings, of **6- to 9-inch (150- to 229-mm)** total thickness, that match **24-inch- (610-mm-)** diameter frame and cover.
  - 8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at **12- to 16-inch (300- to 400-mm)** intervals. Omit steps for manholes less than **60 inches (1500 mm)** deep.
  - 9. Steps: **ASTM C 478 (ASTM C 478M)**, individual steps or ladder. Omit steps for manholes less than **60 inches (1500 mm)** deep.
  - 10. Pipe Connectors: **ASTM C 923 (ASTM C 923M)**, resilient, of size required, for each pipe connecting to base section.



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- B. Heavy-Traffic Precast Concrete Manholes: ASTM C 913; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.
1. Ballast: Increase thickness of one or more precast concrete sections or add concrete to structure, as required to prevent flotation.
  2. Gaskets: Rubber.
  3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch (150- to 229-mm) total thickness, that match 24-inch- (610-mm-) diameter frame and cover.
  4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.
  5. Steps: Manufactured from deformed, 1/2-inch (13-mm) steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.
  6. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.
- C. Cast-in-Place Concrete Manholes: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Ballast: Increase thickness of concrete, as required to prevent flotation.
  2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch (150- to 229-mm) total thickness, that match 24-inch- (610-mm-) diameter frame and cover.
  3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.
  4. Steps: Manufactured from deformed, 1/2-inch (13-mm) steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.
- D. Fiberglass Manholes: ASTM D 3753, fabricated, glass-fiber-reinforced polyester.
1. Diameter: 48 inches (1200 mm) minimum, unless otherwise indicated.
  2. Ballast: Increase thickness of concrete base, as required to prevent flotation.
  3. Base Section: Concrete, 6-inch (150-mm) minimum thickness.
  4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor

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into base, riser, and top section sidewalls with steps at 12- to 16-inch (300- to 400-mm) intervals. Omit steps for manholes less than 60 inches (1500 mm) deep.

5. Pipe Connectors: ASTM C 923 (ASTM C 923M), resilient, of size required, for each pipe connecting to base section.
- E. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24-inch (610-mm) ID by 7- to 9-inch (178- to 229-mm) riser with 4-inch (100-mm) minimum width flange, and 26-inch- (660-mm-) diameter cover. Include indented top design with lettering "SANITARY SEWER" cast into cover.
- F. Manhole Cover Inserts: Manufactured, plastic form, of size to fit between manhole frame and cover and designed to prevent stormwater inflow. Include handle for removal and gasket for gastight sealing.
  1. Type: Solid.
  2. Type: With drainage and vent holes.
  3. Type: With valve.

## 2.7 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
  1. Cement: ASTM C 150, Type II.
  2. Fine Aggregate: ASTM C 33, sand.
  3. Coarse Aggregate: ASTM C 33, crushed gravel.
  4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cementitious materials ratio.
  1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
  2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 400), deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.
  1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: 1 percent through manhole.
    - b. Invert Slope: 2 percent through manhole.
  2. Benches: Concrete, sloped to drain into channel.

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- a. Slope: 8 percent.
- b. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, **3000 psi (20.7 MPa)** minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, **Grade 60 (Grade 400)**, deformed steel.

#### 2.8 PROTECTIVE COATINGS

A. Description: One- or two-coat, coal-tar epoxy; **15-mil (0.38-mm)** minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:

1. Concrete Manholes: On interior surface.
2. Concrete Manholes: On exterior surface.
3. Concrete Manholes: On exterior and interior surfaces.
4. Manhole Frames and Covers: On entire surfaces.
5. Manhole Frames and Covers: On surfaces that will be exposed to sewer gases.

#### 2.9 BACKWATER VALVES

A. Gray-Iron Backwater Valves: ASME A112.14.1, gray-iron body and bolted cover, with bronze seat.

1. Horizontal Type: With swing check valve and hub-and-spigot ends.
2. Combination Horizontal and Manual Gate-Valve Type: With swing check valve, integral gate valve, and hub-and-spigot ends.
3. Terminal Type: With bronze seat, swing check valve, and hub inlet.

B. PVC Backwater Valves: Similar to ASME A112.14.1, horizontal type; with PVC body, PVC removable cover, and PVC swing check valve.

#### 2.10 CLEANOUTS

A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:

1. Light Duty: In earth or grass foot-traffic areas.
2. Medium Duty: In paved foot-traffic areas.
3. Heavy Duty: In vehicle-traffic service areas.

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4. Extra-Heavy Duty: In roads.
  5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.
- B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

### PART 3 - EXECUTION

#### 3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

#### 3.2 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
1. Use warning tape or detectable warning tape over ferrous piping.
  2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

#### 3.3 PIPING APPLICATIONS

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:
1. **NPS 3 (DN80)**: Hub-and-spigot, Extra-Heavy class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  2. **NPS 3 (DN80)**: Hub-and-spigot, Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  3. **NPS 3 (DN80)**: Hubless cast-iron soil pipe and fittings, couplings, and coupled joints.
  4. **NPS 3 (DN80)**: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
  5. **NPS 3 (DN80)**: Stainless-steel drainage pipe and fittings, gaskets, and gasketed joints. Use EPDM-compound gaskets, unless otherwise indicated. Use nitrile-rubber-compound gaskets for wastes containing gasoline or oil.

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6. **NPS 3 (DN80):** ABS, SDR 35, sewer pipe and fittings; solvent-cemented joints; or gaskets and gasketed joints.
  7. **NPS 4 to NPS 6 (DN100 to DN150):** Hub-and-spigot, Extra-Heavy class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  8. **NPS 4 to NPS 6 (DN100 to DN150):** Hub-and-spigot, Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  9. **NPS 4 to NPS 6 (DN100 to DN150):** Hubless cast-iron soil pipe and fittings, couplings, and coupled joints.
  10. **NPS 4 and NPS 6 (DN100 and DN150):** Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
  11. **NPS 4 and NPS 6 (DN100 and DN150):** Stainless-steel drainage pipe and fittings, gaskets, and gasketed joints. Use EPDM-compound gaskets, unless otherwise indicated. Use nitrile-rubber-compound gaskets for wastes containing gasoline or oil.
  12. **NPS 4 and NPS 6 (DN100 and DN150):** ABS, SDR 35, sewer pipe and fittings; solvent-cemented joints; or gaskets and gasketed joints.
  13. **NPS 4 and NPS 6 (DN100 and DN150):** Corrugated PE drainage tubing, PVC socket-end fittings, gaskets, and gasketed joints.
  14. **NPS 4 and NPS 6 (DN100 and DN150):** Cellular-core PVC pipe, PVC sewer pipe fittings, and solvent-cemented joints.
  15. **NPS 4 and NPS 6 (DN100 and DN150):** PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
  16. **NPS 4 and NPS 6 (DN100 and DN150):** Nonreinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
  17. **NPS 8 and NPS 10 (DN200 and DN250):** Hub-and-spigot, Extra-Heavy class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  18. **NPS 8 and NPS 10 (DN200 and DN250):** Hub-and-spigot, Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  19. **NPS 8 and NPS 10 (DN200 and DN250):** Hubless cast-iron soil pipe and fittings, couplings, and coupled joints.
  20. **NPS 8 and NPS 10 (DN200 and DN250):** Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
  21. **NPS 8 and NPS 10 (DN200 and DN250):** Stainless-steel drainage pipe and fittings, mechanical couplings, and coupled joints. Use EPDM-compound seal, unless otherwise indicated. Use nitrile-rubber-compound seal for wastes containing gasoline or oil.
  22. **NPS 8 and NPS 10 (DN200 and DN250):** ABS, SDR 42, sewer pipe and fittings; solvent-cemented joints; or gaskets and gasketed joints.
  23. **NPS 8 and NPS 10 (DN200 and DN250):** Corrugated PE drainage tubing, PVC socket-end fittings, gaskets, and gasketed joints.
  24. **NPS 8 and NPS 10 (DN200 and DN250):** PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
  25. **NPS 8 and NPS 10 (DN200 and DN250):** Nonreinforced- concrete sewer pipe and fittings, gaskets, and gasketed joints.
  26. **NPS 12 and NPS 15 (DN300 and DN375):** Hub-and-spigot, Extra-Heavy class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.

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27. **NPS 12 and NPS 15 (DN300 and DN375)**: Hub-and-spigot, Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
  28. **NPS 12 to NPS 16 (DN300 to DN400)**: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
  29. **NPS 12 (DN300)**: Stainless-steel drainage pipe and fittings, mechanical couplings, and coupled joints. Use EPDM-compound seal, unless otherwise indicated. Use nitrile-rubber-compound seal for wastes containing gasoline or oil.
  30. **NPS 12 (DN300)**: ABS, SDR 42, sewer pipe and fittings; solvent-cemented joints; or gaskets and gasketed joints.
  31. **NPS 12 and NPS 15 (DN300 and DN375)**: Corrugated PE pipe, PVC socket-end fittings, gaskets, and gasketed joints.
  32. **NPS 12 and NPS 15 (DN300 and DN375)**: Corrugated PE pipe and fittings, couplings, and coupled joints.
  33. **NPS 12 and NPS 15 (DN300 and DN375)**: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
  34. **NPS 12 and NPS 15 (DN300 and DN375)**: Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
  35. **NPS 12 and NPS 15 (DN300 and DN375)**: Nonreinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
  36. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: Ductile-iron sewer pipe; standard-pattern, ductile-iron fittings; gaskets; and gasketed joints.
  37. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: Corrugated PE pipe, PVC socket-end fittings, gaskets, and gasketed joints.
  38. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: Corrugated PE pipe and fittings, couplings, and coupled joints.
  39. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: PVC sewer pipe and fittings, gaskets, and gasketed joints.
  40. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: PVC profile gravity sewer pipe and fittings, gaskets, and gasketed joints.
  41. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.
  42. Pipe Sizes **NPS 18 to NPS 24 (DN450 to DN600)**: Nonreinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints.

D. Force-Main Piping: Use the following:

1. **NPS 3 (DN80)**: Ductile-iron sewer pipe; standard- or compact-pattern, ductile-iron fittings; gaskets; and gasketed joints.
2. **NPS 4 to NPS 8 (DN100 to DN200)**: Ductile-iron sewer pipe; standard- or compact-pattern, ductile-iron fittings; gaskets; and gasketed joints.
3. **NPS 4 to NPS 8 (DN100 to DN200)**: PVC pressure pipe, PVC pressure fittings, gaskets, and gasketed joints.
4. **NPS 10 and NPS 12 (DN250 and DN300)**: Ductile-iron pipe; standard- or compact-pattern, ductile-iron fittings; gaskets; and gasketed joints.

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5. **NPS 10 and NPS 12 (DN250 and DN300):** PVC pressure pipe; compact-pattern, ductile-iron fittings; gaskets; and gasketed joints.

#### 3.4 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
  1. Use the following pipe couplings for nonpressure applications:
    - a. Sleeve type to join piping, of same size, or with small difference in OD.
    - b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
    - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
  2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.
- B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

#### 3.5 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
  1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
  2. Install piping with **36-inch (1000-mm)** minimum cover.



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- F. Install force-main piping between and connect to building's sanitary-drainage force main and termination point indicated.
    - 1. Install piping with restrained joints at horizontal and vertical changes in direction. Use cast-in-place concrete supports and anchors or corrosion-resistant rods and clamps.
    - 2. Install piping with **36-inch (1000-mm)** minimum cover.
  - G. Extend sanitary sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
  - H. Install ductile-iron, force-main piping according to AWWA C600.
  - I. Install PVC force-main piping according to AWWA M23.
  - J. Install force-main piping between and connect to building's force main and termination point indicated.
  - K. Install force-main piping between and connect to packaged sewage pump station outlet and termination point indicated.
  - L. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

#### 3.6 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to installations indicated.
- B. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: With rubber gaskets according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook." Use gaskets that match class of pipe and fittings.
  - 1. Install PE film, pipe encasement over hub-and-spigot, cast-iron soil pipe and fittings according to ASTM A 674 or AWWA C105.
- C. Hubless Cast-Iron Soil Pipe and Fittings: With CISPI-type couplings according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
  - 1. Install PE film, pipe encasement over hubless cast-iron soil pipe and fittings according to ASTM A 674 or AWWA C105.
- D. Hubless Cast-Iron Soil Pipe and Fittings: With heavy-duty-type couplings according to CISPI 310, CISPI's "Cast Iron Soil Pipe and Fittings Handbook," and coupling manufacturer's written instructions.



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1. Install PE film, pipe encasement over hubless cast-iron soil pipe and fittings according to ASTM A 674 or AWWA 105.
- E. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.
  1. Install PE film, pipe encasement over ductile-iron sewer pipe and ductile-iron fittings according to ASTM A 674 or AWWA C105.
- F. Stainless-Steel Drainage Piping: According to ASME A112.3.1 and manufacturer's written instructions.
- G. ABS Pipe and Fittings: As follows:
  1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
  2. Install according to ASTM D 2321.
- H. PE Pipe and Fittings: As follows:
  1. Join pipe, tubing, and gasketed fittings with gaskets for watertight joints according to ASTM D 2321 and manufacturer's written instructions.
  2. Install according to ASTM D 2321 and manufacturer's written instructions.
  3. Install corrugated piping according to the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
- I. PVC Pressure Pipe and Fittings: Join and install according to AWWA M23.
- J. PVC Sewer Pipe and Fittings: As follows:
  1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
  2. Join profile sewer pipe fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
  3. Install according to ASTM D 2321.
- K. Concrete Pipe and Fittings: Install according to ACPA's "Concrete Pipe Installation Manual." Use the following seals:
  1. Round Pipe and Fittings: **ASTM C 443** (**ASTM C 443M**), rubber gaskets.
- L. System Piping Joints: Make joints using system manufacturer's couplings, unless otherwise indicated.
- M. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- N. Install with top surfaces of components, except piping, flush with finished surface.

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#### 3.7 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops **3 inches (76 mm)** above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete manhole sections with gaskets according to ASTM C 891.
- E. Construct cast-in-place manholes as indicated.
- F. Install fiberglass manholes according to manufacturer's written instructions.

#### 3.8 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

#### 3.9 BACKWATER VALVE INSTALLATION

- A. Install horizontal units in piping where indicated.
- B. Install combination units in piping and in structures where indicated.
- C. Install terminal units on end of piping and in structures where indicated. Secure units to structure walls.

#### 3.10 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, **18 by 18 by 12 inches (450 by 450 by 300 mm)** deep. Set with tops **1 inch (25 mm)** above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

#### 3.11 TAP CONNECTIONS

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- A. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.
  - B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus **6-inch (150-mm)** overlap, with not less than **6 inches (150 mm)** of concrete with 28-day compressive strength of **3000 psi (20.7 MPa)**.
  - C. Make branch connections from side into existing piping, **NPS 4 to NPS 20 (DN100 to DN500)**. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye with not less than **6 inches (150 mm)** of concrete with 28-day compressive strength of **3000 psi (20.7 MPa)**.
  - D. Make branch connections from side into existing piping, **NPS 21 (DN525)** or larger, or to underground structures by cutting opening into existing unit large enough to allow **3 inches (76 mm)** of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall, unless otherwise indicated. On outside of pipe or structure wall, encase entering connection in **6 inches (150 mm)** of concrete for minimum length of **12 inches (300 mm)** to provide additional support of collar from connection to undisturbed ground.
    - 1. Use concrete that will attain minimum 28-day compressive strength of **3000 psi (20.7 MPa)**, unless otherwise indicated.
    - 2. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  - E. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

#### 3.12 CLOSING ABANDONED SANITARY SEWERAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
  - 1. Close open ends of piping with at least **8-inch- (200-mm-)** thick, brick masonry bulkheads.
  - 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Structures: Excavate around structure as required and use one procedure below:
  - 1. Remove structure and close open ends of remaining piping.

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2. Remove top of structure down to at least **36 inches (1000 mm)** below final grade. Fill to within **12 inches (300 mm)** of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.
  3. Backfill to grade according to Division 2 Section "Earthwork."

#### 3.13 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
  1. Place plug in end of incomplete piping at end of day and when work stops.
  2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately **24 inches (600 mm)** of backfill is in place, and again at completion of Project.
  1. Submit separate reports for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
  1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to authorities having jurisdiction.
  3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  4. Submit separate reports for each test.
  5. If authorities having jurisdiction do not have published procedures, perform tests as follows:

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- a. Sanitary Sewerage: Perform hydrostatic test.
  - 1) Allowable leakage is maximum of 50 gal. per inch of nominal pipe size per mile (4.6 L per millimeter of nominal pipe size per kilometer) of pipe, during 24-hour period.
  - 2) Close openings in system and fill with water.
  - 3) Purge air and refill with water.
  - 4) Disconnect water supply.
  - 5) Test and inspect joints for leaks.
  - 6) Option: Test ductile-iron piping according to AWWA C600, Section "Hydrostatic Testing." Use test pressure of at least 10 psig (69 kPa).
- b. Sanitary Sewerage: Perform air test according to UNI-B-6.
  - 1) Option: Test concrete piping according to ASTM C 924 (ASTM C 924M).
- c. Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than one and one-half times maximum system operating pressure, but not less than 150 psig (1035 kPa).
  - 1) Ductile-Iron Piping: Test according to AWWA C600, Section "Hydraulic Testing."
  - 2) PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.
6. Manholes: Perform hydraulic test according to ASTM C 969 (ASTM C 969M).
7. Leaks and loss in test pressure constitute defects that must be repaired.
8. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

**END OF SECTION 330101**

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