# A PROJECT OF THE PEORIA PARK DISTRICT

# PEORIA ZOO TAKIN ENCLOSURE GLEN OAK PARK 2218 N. PROSPECT RD. PEORIA, ILLINOIS 61603

PEORIA PARK DISTRICT PEORIA, ILLINOIS



PROJECT # 15-011 DATE: OCTOBER 27, 2015 PROJECT MANUAL PACKAGE #\_\_\_\_

# PEORIA ZOO TAKIN ENCLOSURE GLEN OAK PARK 2218 N. PROSPECT RD. PEORIA, ILLINOIS 61603

ARCHITECT:	APACE DESIGN ARCHITECTS & ENGINEERS 2112 E. WAR MEMORIAL DR. PEORIA, IL 61614 ATTN: BEN KAUFFMAN TELEPHONE: 309-685-4722
OWNER:	PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, PEORIA, ILLINOIS
TRUSTEES:	TIMOTHY J. CASSIDY, PRESIDENT ROBERT L. JOHNSON, SR. JACQUELINE J. PETTY WARREN E. RAYFORD KELLY A. CUMMINGS MATTHEW P. RYAN NANCY L. SNOWDEN
PROJECT MANAGER:	BECKY FREDRICKSON PLANNING, DESIGN & CONSTRUCTION DIVISION BRADLEY PARK EQUIPMENT SERVICE 1314 N. PARK ROAD PEORIA, ILLINOIS 61604 TELEPHONE: (309) 686-3386
ADMINISTRATIVE STAFF:	BONNIE W. NOBLE, EXECUTIVE DIRECTOR BRENT WHEELER, DEPUTY DIRECTOR MATT FREEMAN, SUPERINTENDENT OF PARKS JANET BUDZYNSKI, SUPERINTENDENT OF FINANCE AND ADMINISTRATIVE SERVICES BECKY FREDRICKSON, SUPERINTENDENT OF PLANNING, DESIGN AND CONSTRUCTION CYNDY MCKONE, SUPERINTENDENT OF MARKETING/ PUBLIC RELATIONS DENNIS MANTICK, SUPERINTENDENT OF RECREATION AND LEISURE SERVICE SHALESSE PIE, SUPERINTENDENT OF HUMAN RESOURCES NICK CONRAD, ACTING SUPERINTENDENT OF RIVERFRONT DIVISION MEREDITH DEVERMAN, SUPERINTENDENT OF GOLF

Address all communications regarding this work to the Project Manager listed above.

### **ADVERTISEMENT FOR BIDS**

Sealed bids will be received by the Peoria Park District, Peoria, Illinois, hereinafter known as the Owner, for the following project:

Peoria Zoo Takin Enclosure Glen Oak Park 2218 N. Prospect Rd. Peoria, IL 61603

It is the intent of the Owner to receive Base Bids & Alternates for the project listed above.

Sealed bids will be received until Tuesday, November 24, 2015, 1:30 p.m. prevailing time, by the Owner, at the Peoria Park District Administrative Office, 1125 W. Lake Ave., Peoria, Illinois 61614. (The Board Room clock shall be the official time keeping device in respect to the bid submission deadline.)

An electronic file including Bid Documents is available at <u>www.peoriaparks-planning.org</u> at no charge. Bid Documents, including Plans, Specifications and Interpretations for this project may be obtained at the Planning, Design & Construction Department, Bradley Park Equipment Service, 1314 N. Park Road, Peoria, IL 61604. Telephone (309) 686-3386. A non-refundable plan deposit of \$75.00 will be charged for each printed set of Bid Documents.

A list of planholders can be obtained upon request. This information will be available up to twenty-four (24) hours prior to the scheduled bid opening time. After that deadline, no information pertaining to the project will be given.

A 10% Bid Bond is required, and is to be included with the Bid Proposal. The successful Bidder will be required to furnish a 100% Performance Bond and a 100% Labor and Materials Payment Bond within ten (10) days of formal Award of Contract.

The general prevailing rate of wage for the Peoria area shall be paid for each craft or type of worker needed to execute this contract or perform this work as required by the State of Illinois Department of Labor. Additionally, it is required that provisions of the Illinois Preference Act, the Illinois Drug Free Workplace Act, and the Substance Abuse Prevention on Public Works Act must be adhered to. Bidders are also advised that contract documents for this project include the non-discrimination, equal opportunity and affirmative action provisions in the Human Rights Act and rules and regulations of the Department of Human Rights. The Peoria Park District is an AA/EEO organization and encourages participation by minority and female-owned firms.

The Peoria Park District reserves the right to reject any or all bids, waive technical deficiencies, informalities or irregularities or rebid any project.

PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, ILLINOIS

BY: TIMOTHY J. CASSIDY, President

BY: V. JOYCE MCLEMORE, Secretary

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# SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

#### 1. INSTRUCTIONS TO BIDDERS

- A. "Instructions to Bidders", AIA Document A701, 1997 Editions, published by the American Institute of Architects, including revisions adopted before date of this Project Manual, is hereby made part of these specifications with same force and effect as though set forth in full.
- **B.** The following modifies, changes, deletes from or adds to the **Instructions to Bidders** (AIA Document A701, 1997 Edition). Where any Article of the Instructions to Bidders is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.
- C. Parenthesis () indicates the appropriate section and Subparagraph of the Instructions to Bidders which each paragraph of the Supplementary Instructions to Bidders modifies or refers to.

#### 2. PROJECT DESCRIPTION

- A. The Project description generally is as follows:
  - 1. BASE BID:

Work includes, but is not limited to, sitework, utilities, masonry, carpentry, caging, HVAC, electrical, plumbing, and finishes associated with the construction of the Takin Enclosure.

#### 2. ALTERNATES:

Add Alternate #1: Three tube skylights and installation

Add Alternate #2: Trench drain grates (information bid only). This cost shall be incurred in the base bid but listed under this alternate as an information item only.

### B. PRE-BID MEETING :

1. A pre-bid meeting will be held at the site at 10 :00 a.m. on Tuesday, November 3, 2015.

#### 3. CODES AND PERMITS

- A. COSTS ASSOCIATED WITH REGULATORY COMPLIANCE. All Work performed in connection with this Project shall be in compliance with the requirements of all applicable local, state, and federal laws, regulations, and rules, as well as the requirements of the Construction Documents. The Bid Price shall reflect all costs of compliance to those requirements, whether or not specifically stated in the Construction Documents or specific sections of the Project Manual.
- **B. PERMITS/FEES.** Work shall not commence until all required building (and/or other) permits have been secured by the Contractor and copies of these permits submitted to the Owner's Representative. Cost of permits is to be included in the Bid Price.

### 4. BID GUARANTY

The bid must be accompanied by a Bid Guaranty which shall not be less than 10% of the amount of the Bid. At the option of the Bidder, the 10% Guaranty may be a Certified Check, Cashier's Check, or a Bid Bond. The Bid Bond shall be secured by a Guaranty or a Surety Company acceptable to the Owner. No bid will be considered unless it is accompanied by the required Guaranty. Funds must be made payable to the order of the Owner. Cash deposits will not be accepted. The Bid Guaranty shall ensure the execution of the Agreement and the furnishing of the Surety Bond or Bonds by the successful Bidder, all as required by the Contract Documents.

#### 5. AWARD OF CONTRACT/REJECTION OF BIDS:

The Contracts will be awarded on the basis of Paragraph 5.3 of the Instructions to Bidders. The Bidders to whom the awards are made will be notified at the earliest possible date. The Owner, however, reserves the right to reject any and all Bids, to accept any combination of base bids and alternates and to waive any technical deficiencies, informalities, or irregularities in Bids received whenever such rejection or waiver is in its interest.

No bid shall be withdrawn for a period of sixty (60) days after the opening of bids without the consent of the Owner. The failure of the Bidder to submit a Bid Bond, Certified Check or Cashier's Check in the full amount to cover all proposals bid upon shall be sufficient cause for rejection of his bid. The award will be made contingent upon submittal and evaluation of Contractor's Qualification Statement, Bonds, Certificate of Insurance, Contractor Certification(s), including Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors, etc.

#### 6. EXECUTION OF AGREEMENT:

Subsequent to the award and within ten (10) days after the prescribed forms are prepared and presented for signature by the Owner's Representative, the successful Bidder shall execute and return to the Owner's Representative an Agreement in the form included in the Contract Documents in such number of copies as the Owner may require. The President of the Board of Trustees will complete execution of Agreement after all bonds and any other required documents have been received by the Park District. One fully executed copy of Agreement will then be returned to Contractor.

#### 7. PERFORMANCE BOND/LABOR AND MATERIAL PAYMENT BOND & INSURANCE

- A. BONDS REQUIRED. Having satisfied all conditions of award as set forth elsewhere in these Documents, the successful Bidder shall, within ten (10) calendar days after award of contract, furnish Surety Bonds in penal sums, each not less than the amount of the Contract as awarded as security for the faithful performance of the Contract (Performance Bond), and for the payment (Labor and Materials Payment Bond) of all persons, firms or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment or services employed or used by him in performing the work.
- B. FORM OF BONDS. Such bonds shall be in the same form as the samples included in the Project Manual and shall bear the same date as or a date subsequent to that of the Agreement. The current Power of Attorney for the person who signs for any Surety Company shall be attached to such Bonds. Bonds shall be signed by a Guaranty or Surety Company acceptable to the Owner.
- C. COST OF PERFORMANCE BOND/LABOR AND MATERIAL PAYMENT BOND. All costs for the Performance Bond/Labor and Material Payment Bond shall be included in the submitted Bid Price.
- **D. INSURANCE.** Insurance requirements for this project are addressed both in the Supplementary General Conditions and in "Attachment A.6", in the "Exhibits" section of this Project Manual.
  - a) In respect to the property ("builders risk") insurance coverages referenced in the Supplementary General Conditions: the successful Bidder will be required to provide such coverages as the work of the Project will be accomplished by one general contractor.
- E. TIME FRAMES. The successful Bidder shall, within ten (10) days after award of contract by the Board of Trustees, submit Proof of Insurance coverages/Bonds in the form and amounts required to the Owner's Representative. Should the Bidder be unable to provide the required Proof of Insurance(s)/Bonds within the specified ten day period the Owner reserves the right, at its sole discretion, to withdraw its award of contract from that Bidder.

### 8. DEFAULT

A. The failure of the successful Bidders to execute the Agreement, supply the required Bonds or proof of required insurance coverage(s) within (ten) 10 days after award of contract, or within such extended period as the Owner may grant based upon reasons determined sufficient by the Owner, may constitute a default. In such case, award of contract will be transferred to the second lowest bidder.

#### 9. CONTRACTOR'S QUALIFICATION STATEMENT

A. Contractor's Qualification Statement (AIA Document 305) shall be submitted by low bidder for evaluation prior to award of contract <u>if</u> so requested by the Owner or his representatives.

### **10. LIST OF SUBCONTRACTORS/PRODUCT & EQUIPMENT SUBSTITUTIONS**

- A. Each Bidder shall submit a "MAJOR SUBCONTRACTORS LIST" proposed to be used in the execution of the Work. If there will be no subcontractors, the Bidder shall state "No Subcontractors" on this form. The completed form is due with the Bid Proposal.
  1) Identify the trade name, address, telephone number, and category of work of each subcontractor.
  - 2) Failure to submit the "Major Subcontractors List" with the Bid Proposal may result in the rejection of the Bid.
  - **3**) Delete Subparagraphs (6.3.1.1) and (6.3.1.2) from AIA A701.
- **B.** The Bidder, by submission of a signed bid form, agrees to install all products and equipment by brand name or names specified in the Technical Specifications sections of this Project Manual. "Or equal" substitutions will be allowed <u>only if approved in writing prior to the bid opening and listed in the "Substitutions" section of the Bid Form.</u>

### 11. CONTRACT ADMINISTRATION FORMS/COSTS OF FORMS

- A. **REQUIRED FORMS.** The following AIA forms will be used (AIA forms will be supplied by the Owner if requested, and charged to the Contractor at cost) in the administration of the project:
  - 1) AIA Document A310: "Bid Bond", February 1970 edition
  - 2) AIA Document A305: "Contractor's Qualification Statement", 1986 edition
  - 3) AIA Document G702: "Application and Certificate of Payment", May 1992 edition
  - 4) AIA Document G703: "Continuation Sheet", May 1992 edition
- B. OTHER FORMS. Other contract administration forms (to be provided by the Owner unless otherwise noted) required for use in the Project are:
  - 1) Major Subcontractors List
  - 2) Contractor's Affidavit
  - 3) Individual Contractor Form
  - 4) Corporate or Partnership Form

- 5) Performance Bond
- 6) Labor and Material Payment Bond
- 7) Lien Waiver Forms
- 8) Weekly Workforce Report
- 9) Certified Payroll Form (Contractor may use own form)
- 10) Insurance Forms: As required in Attachment A (at end of Project Manual) (will not be provided by Owner)

#### 11) Agreement Between Owner and Contractor

Examples of these forms are included in the Project Manual.

### 12. CONSTRUCTION TIME AND LIQUIDATED DAMAGES CLAUSE:

- 2.5.1 **PROJECT COMPLETION**. The Agreement will include the following paragraph(s) or language substantially the same, regarding construction time and liquidated damages:
  - LIQUIDATED DAMAGES: Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not Substantially Complete within the time specified below, plus any extensions thereof allowed in accordance with Article 8 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time.
  - 2) Accordingly, instead of requiring any such proof, Owner and Contractor agree that as Liquidated Damages for delay (but not as a penalty) Contractor shall pay Owner TWO HUNDRED AND FIFTY DOLLARS (\$250.00) for each calendar day that expires after two hundred sixty one (261) calendar days from Notice of Award until Substantial Completion is attained. The work is tentatively scheduled to begin on December 10, 2015 and be at Substantial Completion by August 26, 2016.
  - 3) After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work necessary to achieve Final Completion within fourteen (14) calendar days or any proper extension thereof granted by Owner, Contractor shall pay Owner TWO HUNDRED AND FIFTY (\$250.00) dollars for each day that expires after the time specified.
  - 4) Owner and Contractor agree that the per day liquidated damage amounts set forth in subparagraphs "2" and "3" of this section constitute a reasonable forecast of the financial losses, actual costs and increased expenses the Owner may incur as a result of delayed Substantial or Final Completion of the Project.

#### 13. PROJECT MANUAL/PLANS & SITE VISITATION

- A. A set of Bid Documents may be examined, at no charge, at the office of the Owner's Representative.
- B. PLAN DEPOSIT. An electronic file including Bid Documents is available at <u>www.peoriaparks-planning.org</u> at no charge. A printed set of Bid Documents, including Plans, Specifications and Interpretations for this project may be obtained at the Planning, Design & Construction Department, Bradley Park Equipment Service, 1314 N. Park Road, Peoria, IL 61604. Telephone (309)686-3386. A non-refundable plan deposit of \$75.00 will be charged for each printed set of Bid Documents.
- C. FAMILIARITY WITH BID DOCUMENTS & SITE VISITATION. Bidders, by submission of their Bids, represent that they have visited the site to acquaint themselves with the local conditions in which the Work is to occur, and that they are familiar with all the requirements of the Project, as defined in the Project Manual and the Plan(s).

### 14. OTHER MODIFICATIONS TO AIA-701/OTHER CONDITIONS

- A. Add the following sentence to (4.1.7): "Bidder shall submit two (2) completed copies of Bid Form and retain one (1) copy for his files."
- B. Delete Section (6.2) "Owner's Financial Capability"; and last sentence of Paragraph (4.2.1.)
- C. In reference to (7.2.1), the Peoria Park District reserves the right of final approval of bonding companies.
- **D.** Delete paragraph (7.1.3).

#### 15. EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION/SEXUAL HARASSMENT

A. The "Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors Form" and "Workforce Profile" and "Sexual Harassment Policy" shall be filled out and returned with the Bid. Failure to submit a completed "Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors Form" and "Workforce Profile" and "Sexual Harassment Policy" may result in rejection of the bid.

- **B.** Effective July 1, 1993, every party to a public contract and every party bidding on public contracts is required to have a written "Sexual Harassment Policy" that contains:
  - 1) A definition of sexual harassment under state law;
  - 2) A description of sexual harassment utilizing examples;
  - 3) A formalized complaint procedure;
  - 4) A statement of victim's rights;
  - 5) Directions on how to contact the Illinois Department of Human Rights Illinois companies. Out-of-State companies must include directions on how to contact the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency.
  - 6) A recitation that there cannot be any retaliation against employees who elect to file charges.

Recommendation: Your "Sexual Harassment Policy" should be drafted in language easy to understand and any revisions should be reviewed by legal counsel. A copy of your policy should be posted in a prominent and accessible location to assure all employees will be notified of the company's position.

In order to conduct business with the Peoria Park District, you must have a written "Sexual Harassment Policy" that conforms to the new Act.

FAILURE TO DO SO WILL DISQUALIFY YOU AS AN ELIGIBLE VENDOR.

C. Lowest responsible bidder not meeting the Park District's goal of 12% for minority/women participation, must provide proof of efforts made in contacting an adequate number of minority and women owned firms and/or labor.

#### 16. BID SUBMISSION

- A. DATE, TIME & PLACE OF RECEIVING BIDS. Bids will be received until the date and time listed in the "Advertisement for Bids", at which time they will be publicly opened, read aloud and recorded. The Bid Opening will be held at the place listed in the "Advertisement for Bids".
- B. REQUIRED ITEMS. The following items <u>must be included</u> as part of the "BID":
  - 1) Two (2) signed copies of the **BID FORM**. (Retain the third copy for your files.)
  - 2) The PEORIA PARK DISTRICT CERTIFICATE OF EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE FOR CONTRACTORS AND VENDORS FORM and SEXUAL HARASSMENT POLICY.
  - 3) The WORKFORCE PROFILE.
  - 4) The ILLINOIS DRUG FREE WORKPLACE CERTIFICATION.
  - 5) The CONTRACTOR CERTIFICATION (individual or corporate/partnership).
  - 6) The LIST OF SUBCONTRACTORS. (Submit form and state "No Subcontractors" on the form, if none will be used.)
  - 7) The **BID** GUARANTY.
  - 8) The CERTIFICATION OF SAFETY COMPLIANCE.

#### 9) SUBSTANCE ABUSE PREVENTION PROGRAM CERTIFICATION

- C. **BID SUBMISSION**. The "BID" shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled with the following information, in order to prevent premature opening of the bid:
  - "PROPOSAL"
  - NAME OF PROJECT
  - NAME OF BIDDER
  - DATE/TIME OF BID OPENING

END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

# **BID FORM**

BID TO: PEORIA PARK DISTRICT

### UNDERSIGNED:

- 1. Acknowledges receipt of:
  - A. Project Manual and Drawings for:
  - B. Addenda: No. \_\_\_\_\_ through No. \_\_\_\_\_
- 2. Has examined facility and the bid documents and shall be responsible for performing work specifically required of him by all parts of bidding documents including specifications for entire project, even though such work may be included as related requirements specified in other divisions or sections.
- 3. And agrees to enter into and execute Contract with Owner, if awarded on basis of this bid, and to:
  - A. Furnish Bonds and Insurance required by the Bidding & Contract Documents.
  - B. Accomplish work in accord with Contract.
  - C. Complete work within specified Contract time.
- 4. <u>CONTRACT TIME</u>: Contractor agrees to Substantially Complete ALL WORK as required by the Contract Documents per the Supplementary General Conditions and Supplementary Instructions to Bidders.

### 5. **<u>BASE BIDS</u>**:

A. Base Bid:

Bidder agrees to perform all building and site work, as set forth in the Project Manual and Drawings for the sum of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_)

### 6. <u>ALTERNATES</u>:

Bidder agrees to perform all building and/or site work items as set forth below. The prices submitted may be accepted either at the time of Base Bid approval or up to no later than ninety (90) days after award of the Bid; however, if not approved at the time of the award of the Base Bid, the contract times as set forth in the Project Manual and Drawings will be adjusted to compensate for the additional time taken in award of the Alternate:

d From: _		PROJECT NO. 15-011 BID FOR: PEORIA ZO LOCATION: GLEN OA	O TAKIN ENCLOSURE AK PARK
А.	Add Alternate #1:		
	Three tube skylights and installation		
		Dollars (\$	)
B.	Add Alternate #2:		
	Trench drain grates (information bid only)		
		Dollars (\$	)
<u>UNI</u> A.	T PRICES: Bidders submitting prices for the Base Bid, shall sul Prices shall include all costs, including but not limit necessary for a complete installation.	omit Unit Prices for adding o ed to preparation, labor, equi	or deleting work. Unit apment, and materials
	ITEM	<u>UNIT</u>	UNIT PRICE
	1 1/2 " water line (installed)	LF	\$
PRC Base spec cons from	<b>DPOSED SUBSTITUTION LIST:</b> e Bid(s) and Alternates are understood to include only ified in the Bid Documents. The following is a list of truction which the Bidder proposes to furnish on this p a Base Bid(s).	those product brands, items, substitute products, equipme project, with difference in pri	and elements which are ont or methods of ice being added or deducte
Bidd prod subs	ler understands that acceptance of any proposed substi uct brand, item, or element specified prior to bid open titutions listed below will be indicated before executin	tution which has not been ap ing is at Owner's option. Ap g Contract.	proved as an "equal" to the proval or rejection of any
	ITEM	ADD	DEDUCT
		\$	\$
		\$	\$
		\$	\$
BID	DERS CHECKLIST:		
Did	you visit the site?	Yes	No
Is Bi	id Security enclosed? (If applicable)	Yes	No
Is Pe	eoria Park District Certificate of Equal Employment	Yes	No

Opportunity Compliance for Contractors and Vendors and Sexual Harassment Policy enclosed?

Is Workforce Profile enclosed?	Yes	No
Is List of Subcontractors enclosed?	Yes	No
Is Contractor Certification enclosed?	Yes	No
Is Ill. Drug Free Workplace Certification enclosed?	Yes	No
Is Certificate of Safety Compliance enclosed?	Yes	No
Is Substance Abuse Prevention Program Certification enclosed?	Yes	No

# 10. **<u>BIDDER INFORMATION</u>**:

NAME OF BIDDER:	
ADDRESS:	
CITY, STATE, ZIP:	
TELEPHONE NO.:	
BY:	
(Signature of Authorized Official)	
TITLE:	
BIDDER'S SEAL	
WITNESS:	

END OF BID FORM



# Peoria Park District

Certificate of Equal Employment Opportunity Compliance

for

### **Contractors and Vendors**

Disclosure of the information requested in this form is required by the Peoria Park District. Failure to properly complete and sign this form will result in it being returned unprocessed thereby resulting in a delay or denial of eligibility to bid.

As part of the Company's commitment to equal employment opportunity practices, this company does the following:

- Recruits, trains, upgrades, promotes and disciplines persons without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- Notifies all recruitment sources that all qualified applicants will be considered for employment without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- When advertising is used, specifies that all qualified applicants will be considered for employment without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- Notifies all labor organizations which furnish this company with any skilled or non-skilled labor of the Company's responsibility to comply with the equal employment opportunity requirements required in all contracts by the Peoria Park District.
- Notifies all of its sub-contractors of their obligation to comply with the equal employment opportunity requirements required in all contracts by the Peoria Park District.
- Has an affirmative action program that assures the company's fair employment practices are understood and carried out by all of its managerial, administrative and supervisory personnel.

Is the Company a minority/woman owned business (MBE/WBE)? \_\_\_\_YES \_\_\_\_NO

The Company does not discriminate against any employees or applicants for employment because of race, color, religion, sex, national origin, veteran status, age, mental or physical ability.

The Company does not maintain segregated facilities for any of its employees on the basis of race, religion, color, national origin, because of habit, local custom, or otherwise.

By signing this form, the Company attests that it complies with all statements listed above as part of the Company's commitment to equal employment opportunity practices. The Company further agrees that it has completed the attached Workforce Profile Sheet truthfully, to the best of its knowledge.

Company Name

Signature of Company Official

Company Address

Name / Title

Telephone Number & Fax Number

Rev. 6/2012

Email Address

PEORIA ZOO TAKIN ENCLOSURE - Project Manual

Office Use Only: Approved: \_\_\_\_\_ Date: \_\_\_\_\_

# WORKFORCE PROFILE - FULL TIME ONLY

Job Classifications	Tota Emplo	l oyees	Blac	ck	Hispa	anic	Nativ Americ	ve can	Asia	an	Vete	eran	Disat	oled
	М	F	М	F	М	F	М	F	М	F	М	F	М	F
1. Officials, Managers, Supervisors														
2. Professionals														
3. Technicians														
4. Sales														
5. Office/Clerical														
6. White Collar Trainees:														
7. Skilled Crafts:														
8. Apprentices:														
9. On-the-job Trainees:														
10. Semi-skilled														
11. Service Workers														
12. Unskilled														
TOTALS														

# WORKFORCE PROFILE INSTRUCTIONS

## **RACE/ETHNIC IDENTIFICATION**

<u>WHITE (not of Hispanic origin)</u>: All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.

BLACK (not of Hispanic origin): All persons having origins in any of the Black racial groups of Africa.

HISPANIC: All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

<u>ASIAN or PACIFIC ISLANDER</u>: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.

<u>NATIVE AMERICAN or ALASKAN NATIVE</u>: All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

## DESCRIPTION OF JOB CLASSIFICATIONS

<u>OFFICIALS, MANAGERS, AND SUPERVISORS</u> - Occupations requiring administrative personnel who set broad policies, and exercise over-all responsibility for the execution of these policies, and direct individual departments or special phases of a firm's operations. Includes: officials, executives, middle management, plant managers, department managers/superintendents, salaried foremen who are members of management, purchasing agents and buyers, and kindred workers.

<u>PROFESSIONALS</u> - Occupations requiring either college graduation or experience of such kind and amount as to provide a comparable background. Includes: accountants/auditors, airplane pilots and navigators, architects, artists, chemists, designers, dietitians, editors, engineers, lawyers, librarians, mathematicians, natural scientists, personnel and labor relations workers, physical scientists, physicians, social scientists, teachers, and kindred workers.

<u>TECHNICIANS</u> - Occupations requiring combination of basic scientific knowledge and manual skill which can be obtained through about 2 years of post high school education, such as is offered in many technical institutes and junior colleges, or through equivalent on-the-job training. Includes: drafters, engineering aids, junior engineers, scientific assistants, surveyors, technical illustrators, technicians (medical, dental, electronic physical sciences), and kindred workers.

<u>SALES WORKERS</u> - Occupations engaging wholly or primarily in direct selling. Includes: advertising agents/salespersons, insurance agents/brokers, real estate agents/brokers, stock and bond salespersons, demonstrators, salespersons and sales clerks, and kindred workers.

<u>OFFICE AND CLERICAL WORKERS</u> - Includes all clerical type work regardless of level of difficulty, where the activities are predominantly non-manual though some manual work not directly involved with altering or transporting the products is included. Includes: bookkeepers, cashiers, collectors (bills and accounts), messengers and office couriers, office machine operators, shipping and receiving clerks, stenographers, typist and secretaries, telegraph and telephone operators, and kindred workers.

<u>WHITE COLLAR TRAINEES</u> - Persons engaged in formal training for official, managerial, professional, technical, sales, office and clerical occupations.

<u>SKILLED CRAFTS</u> - Manual worker of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work. Exercise considerable independent judgment and usually receive an extensive period of training. Includes: the building trades hourly paid foremen and leadmen who are not members of management, mechanics and repairmen, skilled machining occupations, compositors and typesetters, electricians, engravers, job setters (metal), motion picture projectionists, pattern and model makers, stationary engineers, tailors and tailoresses, and kindred workers.

<u>APPRENTICES</u> - Persons employed in a program including work training and related instruction to learn a trade or craft which is traditionally considered an apprenticeship, regardless of whether the program is registered with a Federal or State agency.

<u>ON-THE-JOB TRAINEES</u> - Persons engaged in formal training for craftsmen when not trained under apprentice programs; semiskilled, unskilled and service occupations.

<u>SEMI-SKILLED WORKERS</u> - Workers who operate machine or processing equipment or perform other factory-type duties of intermediate skill level which can be mastered in a few weeks and require only limited training.

<u>SERVICE WORKERS</u> - Workers in both protective and non-protective service occupations. Includes: attendants (hospital and other institution, professional and personal service), barbers, charwomen and cleaners, cooks (except household), counter and fountain workers, elevator operators, fire fighters, guards, watchmen and doorkeepers, stewards, janitors, police officers and detectives, porters, waiters and waitresses, and kindred workers.

<u>UNSKILLED WORKERS</u> - Workers in manual occupations which generally require no special training. Perform elementary duties that may be learned in a few days and require the application of little or no independent judgement. Includes: garage laborers, car washers and greasers, gardeners (except farm) and groundskeepers, longshoremen and stevedores, lumbermen, craftsmen and wood choppers, laborers performing lifting, digging, mixing loading and pulling operations, and kindred workers.

# PLEASE BE ADVISED!

Every party to a public contract and every party bidding on public contracts are required to have a written sexual harassment policy that contains:

- (1) a definition of sexual harassment under state law:
- (2) a description of sexual harassment utilizing examples;
- (3) a formalized complaint procedure;
- (4) a statement of victims rights;
- (5) directions on how to contact the Illinois Department of Human Rights Illinois companies. Out-of-State companies must include directions on how to contact the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency.
- (6) a recitation that there cannot be any retaliation against employees who elect to file charges.

**Recommendation:** Your sexual harassment policy should be drafted in language easy to understand and any revisions should be reviewed by legal counsel. A copy of your policy should be posted in a prominent and accessible location to assure all employees will be notified of the company's position.

# <u>In order to conduct business with the PEORIA PARK DISTRICT, you must have a written sexual harassment policy that conforms to the new ACT.</u>

# FAILURE TO DO SO WILL DISQUALIFY YOU AS AN ELIGIBLE VENDOR!!!

Please be advised, effective July 1, 1993, Governor Jim Edgar established under Executive Order Number 7 (Public Act 87-1257) that every party to a public contract and every party bidding on a public contract within the State of Illinois must have a written policy statement prohibiting sexual harassment. The following model policy statement is a draft copy provided for use in formulating your company's policy statement

## SEXUAL HARASSMENT POLICY STATEMENT

It is the responsibility of each individual employee to refrain from sexual harassment and it is the right of each individual employee to work in an environment free from sexual harassment.

### DEFINITION OF SEXUAL HARASSMENT

According to the Illinois Human Rights Act, sexual harassment is defined as:

Any unwelcome sexual advances or requests for sexual favors or any conduct of a sexual nature when

- 1. submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment;
- 2. submission to or rejection of such conduct by an individual is used as the basis for employment decision(s) affecting such individual; or
- 3. such conduct has the purpose or effect of substantially interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.

The courts have determined that sexual harassment is a form of discrimination under Title VII of the U.S. Civil Rights act of 1964, as amended in 1991. One such example is a case where a qualified individual is denied employment opportunities and benefits ividual 😽 that are, instead, awarded to uits (volunta/\y or under pnces or sexual favors. ) to \$ ngue in trde Another example is where ind lual m su t to unw<sub>A</sub> me sexual b Aceive an employment opportunity.

Other conduct commonly considered to be sexual marassment includes.

- $\Rightarrow$  Verbal: Sexual innuendoes, suggestive comments, insults, humor and jokes about sex, anatomy or gender-specific traits, sexual propositions, threats, repeated requests for dates, or statement about other employees, even outside of their presence, of a sexual nature.
- $\Rightarrow$  Non-Verbal: Suggestive or insulting sounds (whistling), leering, obscene gestures, sexually suggestive bodily gestures, "catcalls", "smacking" or "kissing" noises.
- $\Rightarrow$  Visual: Posters, signs, pin-ups, slogans of a sexual nature.
- $\Rightarrow$  Physical: Touching, unwelcome hugging or kissing, pinching, brushing the body, coerced sexual intercourse or actual assault.

Sexual harassment most frequently involves a man harassing a woman. However, it can also involve a woman harassing a man or harassment between members of the same gender.

The most severe and overt forms of sexual harassment are easier to determine; however, some sexual harassment is more subtle and depends to some extent on individual perception and interpretation. The trend in the courts is to assess sexual harassment by a standard of what would offend a "reasonable woman" or a "reasonable man", depending upon the gender of the alleged victim.

An example of the most subtle form of sexual harassment is the use of endearments. The use of terms such as "honey", "darling", and "sweetheart" is objectionable to many women who believe that these terms undermine their authority and their ability to deal with men on an equal and professional level.

Another example is the use of a compliment that could potentially be interpreted as sexual in nature. Below are three statements that might be made about the appearance of a woman in the workplace:

Sexual Harassment Model Policy Statement

- Page 2
  - $\Rightarrow$  "That's an attractive dress you have on."
  - $\Rightarrow$  "That's an attractive dress. It really looks good on you."
  - $\Rightarrow$  "That's an attractive dress. You really fill it out well."

The first statement appears to be simply a compliment. The last is most likely to be perceived as sexual harassment depending on individual perceptions and values. To avoid the possibility of offending an employee, it is best to follow a course of conduct above reproach, or to err on the side of caution.

### **RESPONSIBILITY OF INDIVIDUAL EMPLOYEES**

Each individual employee has the responsibility to refrain from sexual harassment in the workplace. An individual employee who harasses a fellow worker is, of course, liable for his or her individual conduct. The harassing employee will be subject to disciplinary action up to and including discharge in accordance with company/organization policy or a collective bargaining agreement, as appropriate.

### **RESPONSIBILITY OF SUPERVISORY PERSONNEL**

Each supervisor is responsible for maintaining a workplace free of sexual harassment. This is accomplished by promoting a professional environment and by dealing with sexual harassment as with all other forms of employee misconduct.

The courts have found companies/organizations as well as supervisors can be held liable for damages related to sexual harassment by a manager, supervisor, employee, or third party (an individual who is not an employee but does business with a company/organization, such as a contractor, customer, sales representative, or repair person).

Liability is based either on a com	ny rganizati	ponsibility /	maintain a	tann vel o	d discipline, or on the
supervisor acting as an agent of	e com ny/org	zat I. As suct	ervisors 1	st_art quickly	d responsibly, not only to
minimize their own liability, but a	o that / the co	va vorganizati/			
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# RESOLUTION OUTSIDE THE COMPANY/ORGANIZATION

It is hoped that most sexual harassment complaints and incidents can be resolved within a company/organization. However, an employee has the right to contact the Illinois Department of Human Rights (IDHR) or the U.S. Equal Employment Opportunity Commission (EEOC) about filing a formal complaint. An IDHR complaint must be filed within 180 days of the alleged incident(s) unless it is a continuing offense. A complaint with EEOC must be filed within 300 days.

*Illinois Department of Human Rights* (217) 785-5100 – Springfield (217) 785-5125 – TDD Springfield (312) 814-6200 – Chicago (312) 263-1579 – TDD Chicago Illinois Human Rights Commission

(217) 785-4350 – Springfield (217) 785-5125 – TDD Springfield (312) 814-6269 – Chicago (312) 814-4760 – TDD Chicago

### U.S. Equal Employment Opportunity Commission

(312) 353-2613 – Chicago District Office (800) 669-4000 – Toll Free Within State of Illinois (800) 669-6820 – TDD Chicago

An employee who is suddenly transferred to a lower paying job or passed for promotion, after filing a complaint with IDHR or EEOC, may file a retaliation charge, also due 180 days (IDHR) or 300 days (EEOC) from the alleged retaliation.

An employee who has been physically harassed or threatened while on the job may also have grounds for criminal charges of assault and battery.

### FALSE AND FRIVOLOUS COMPLAINTS

False and frivolous charges refer to cases where the accuser is using a sexual complaint to accomplish some end other than stopping sexual harassment. It does not refer to charges made in good faith which cannot be proven. Given the seriousness of the consequences for the accused, a false and frivolous charge is a severe offense that can itself result in disciplinary action.



# ILLINOIS DRUG FREE WORKPLACE CERTIFICATION

The undersigned Contractor/Vendor hereby certifies that it will comply with all provisions of the Illinois Drug Free Workplace Act of 1991.

Dated this \_\_\_\_\_, 20 \_\_\_\_\_,

Contractor/Vendor

By: \_\_\_\_\_

\_\_\_\_\_



# SUBSTANCE ABUSE PREVENTION PROGRAM CERTIFICATION

Project Name:

Location:

The Substance Abuse Prevention on Public Works Act Public Act 95-0635, prohibits the use of drugs and alcohol, as defined in the Act, by employees of the Contractor and by employees of all approved Subcontractors while performing work on a public works project. The Contractor/Subcontractor herewith certifies that it has a superseding collective bargaining agreement or makes the public filing of its written substance abuse prevention program for the prevention of substance abuse among its employees who are not covered by a collective bargaining agreement dealing with the subject as mandated by the Act.

A. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has signed collective bargaining agreements that are in effect for all of its employees, and that deal with the subject matter of Public Act 95-0635.

Contractor/Subcontractor

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

Signature of Authorized Representative Date

B. The undersigned representative of the Contractor/Subcontractor certifies that the contracting entity has in place, for all of its employees not covered by a collective bargaining agreement that deals with the subject of the Act, the attached substance abuse prevention program that meets or exceeds the requirements of Public Act 95-0635.

Contractor/Subcontractor

Name of Authorized Representative (type or print)

Title of Authorized Representative (type or print)

Signature of Authorized Representative Date



# **CERTIFICATION OF SAFETY COMPLIANCE**

The undersigned Contractor/Vendor hereby certify that they and their sub-contractors will comply with any and all prevailing occupational safety and health standards including, but not limited to the following: hazard communication, hearing conservation, respirator use, permit required confined space entry, scaffolding, personal protective equipment, ladder usage, ventilation, flammable and combustible liquids handling and storage and lockout/tagout. Such compliance may include a training component or require a written program of compliance.

Dated this day of \_\_\_\_\_, 20 \_\_\_\_.

CONTRACTOR/VENDOR: \_\_\_\_\_

By: \_\_\_\_\_

# PLEASURE DRIVEWAY AND PARK DISTRICT

# **OF PEORIA, ILLINOIS**

# Individual Contractor Form

# CONTRACTOR CERTIFICATION

I, \_\_\_\_\_\_, do hereby certify that I am a contractor who has not been barred from bidding on a public contract as a result of a violation of either Section 33E-3 (bid-rigging) or Section 33E-4(bid rotating) of the Illinois Criminal Code, Illinois Compiled Statutes 720 ILCS 5/33E-3 and 5/33E-4.

Contractor

By: \_\_\_\_\_

Subscribed and Sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Notary Public

My Commission Expires \_\_\_\_\_, 20\_\_\_\_\_

# PLEASURE DRIVEWAY AND PARK DISTRICT

# **OF PEORIA, ILLINOIS**

# Corporate or Partnership Contractor Form

# CONTRACTOR CERTIFICATION

I,	, a duly authorized agent of
(Agent)	
(Contractor)	, do hereby certify that neither
(Contractor)	, nor any individual presently
affiliated with(Contractor)	, has been barred from
bidding on a public contract as a result of a violation of either Section 33E-3 Illinois Criminal Code, Illinois Compiled Statutes, 720 ILCS 5/33E-3 and 5/	8 (bid-rigging) or Section 33E-4 (bid rotating) of the 33E-4.
Contractor	-
Subscribed and Sworn before me this day of	, 20
Notary Public	-
My Commission Expires, 20	_

# MAJOR SUBCONTRACTORS LIST

The following tabulation of Major Subcontractors shall be attached and made a condition of the Bid. The Bidder expressly understands and agrees to the following provisions:

- A. If awarded a Contract as a result of this Bid, the major subcontractors used in the prosecution of the work will be those listed below.
- B. The following list includes all subcontractors who will perform work representing 5% (five percent) or more of the total Base Bid.
- C. The subcontractors listed below are financially responsible and are qualified to perform the work required.
- D. The subcontractors listed below comply with the requirements of the Contract Documents.
- E. Any substitutions in the subcontractors listed below shall be requested in writing by the Contractor and must be approved in writing by the Owner. No subsubcontractors will be allowed unless specifically stated on the form. All pertinent financial, performance, insurance and other applicable information shall be submitted with the request for substitution(s). Owner shall respond to such requests within 14 calendar days following the submission of all necessary information to the full satisfaction of the Owner.
- F. Failure to submit the list of Major Subcontractors as stated herein shall constitute a material variation from the Invitation to Bid; and any such Bid may be rejected by the Owner.

Subcontractor Name	Address	Telephone	Area of Work	Minority/Women Owned Business (Yes/No)

(Attach additional sheets if required)

### END OF MAJOR SUBCONTRACTORS FORM

# Directory of Minority & Women Owned Business Enterprises Compiled with Information from City of Peoria Equal Opportunity Office Peoria Housing Authority Peoria Park District

### Revised 11/13

Absolute Risk Management Strategies Kelly Peterson	MBE Construction Safety, Job Site Safety Plan Development, Job Site Risk Assessment, Construction OSHA Training 416 Main St., Suite 533, Peoria, IL 61602	309-256-8471 309-222-4050 Cell
Adams Septic & Sewer Services, Inc. Michelle Adams	WBE Septic and Sewer Contractor 1641 N. Tiber Ridge Ct., East Peoria, IL 61611	309-691-6113
Aerial Work Services Company	MBE Landscaping and Seeding 13805 Wadsworth Road, Wadsworth, IL	847-662-5321 847-662-5321 Fax
AFE Construction, Inc. Tommy and Monica Arbuckle	WBE General Contractor WBE P.O. Box 199, Mackinaw, IL 61755	309-303-7065 866- 491-2209 Fax
A & L Salvage, Inc. Archie Brown	MBE Clean Up, Tree Cutting & Removal, Truck Salvaging 824 W. Brons Peoria, IL 61604	309-682-4412
Alexander Brothers Construction Co. Allester Alexander	MBE Concrete, Demolition, Excavation, Landscaping P.O. Box 1508, Peoria, IL 61605	309-673-6768
<b>A. Lucas &amp; Sons Steel</b> Margaret Hanley	WBE Structural Steel Fabrication 1328 SW Washington, Peoria, IL 61602	309-673-8547 309-673-7213 Fax
<b>Ambri Inc.</b> Robert J. Hunt. Jr.	MBE Drywall, Flooring, Painting, Cabinetry 9101 S. Nashville Ave., Oak Lawn, IL 60453	708-233-0217 Ph and Fax
Atherton, P.A. Patricia Atherton	WBE Asphalt, Concrete, Demolition, Excavation 57 Eichorn Road, Spring Bay, IL 61611	309-822-8575 309-822-8782 Fax
A Unique Maintenance Service Andrea McKnight	MBE Commercial and Industrial Construction Cleanup 2101 N. North St., Peoria, IL 61604	309-685-7197 309-685-4472 Fax
Braun Excavating, Inc. Teresa Braun	WBE Demolition, Digging of Footings, Excavation, Pipe Laying 24 Gulf Stream Bartonville, IL 61607	309-697-5454 309-697-6567 Fax
Brown, Leo Trucking, Inc. Leo Brown	MBE Trucking/Hauling P. O. Box 9057, Peoria, IL 61612	309-685-6710 309-685-0759 Fax
Buddy's Landscaping Dexter Davis	MBE Landscaping P. O. Box 1836, Bloomington, IL 61702	309-824-9211 309-454-3342 Fax
Capitol Trucking Eddie Washington	MBE Janitorial Service, Snow Removal, Trucking 2803 Creston Ln., Peoria, IL 61604	309-679-9388 309-339-5313 Cell
Central IL Construction Inc. Jessica Youngman	WBE Land Surveying 416 Germantown Rd., Germantown, IL 61548	309-383-3156
Central IL Rebar Insulators Roger Fleming	MBE Structural Steel and Rebar Replacement 4719 Ridgelawn, Peoria, IL 61615	309-258-1379 888-387-5716 Fax
Central Landscaping Donna Brandenburg	WBE Landscaping 12512 Mendell Rd., Princeville, IL 61559	309-385-4832 309-385-2644 Fax
<b>CJL Landscaping, Inc.</b> Rebecca J. Kelch	WBE Landscaping 10902 W. U. S. Highway 150, Brimfield, IL 61517	309-691-9200 309-691-5131 Fax

C & L Construction & Roofing Co. Jeanette Burns	WBE Roofing, Electrical, Plumbing P.O. Box 416, Peoria, IL 61651	309-672-2641
<b>Clean Sweep Lead Abatement</b> Ricky Walker	MBE Lead-Based Paint Removal 4014 Brighton Peoria, IL 61615	309-689-1146
<b>Clevenger Contractors Inc.</b> Verlee Clevenger	WBE Guardrail, Bridge Rail, Seeding, Fencing 355 Naples Rd., P.O. Box 19, Bluffs, IL 62621	217-754-3411 217-754-3537 Fax
CNS Forestry & Landscaping LLC Christine Schilling	WBE Landscaping, Seeding, Sodding, Tree Removal 1813 1000 <sup>th</sup> St., Lincoln, IL 62656	217-792-3808 217-792-3808 Fax
Cordova Construction Tina Christopher	WBE Concrete Removal, Curb & Gutter Removal, Sidewalk Removal 2424 N. Ellory Road, Peoria, IL 61615	309-674-8810
Cornerstone Builders & Developers Ron Touilly	WBE 6129 W. Southport Rd., Peoria, IL 61615	309-674-9000 309-673-7783 Fax
CSS (Construction Specialties & Services) Dave Suzuki	MBE Building Specialties, Design, Engineering, Estimating P. O. Box 120703 Peoria, IL 61614	309-685-8453
Davis Brothers Construction Company Russell Davis	MBE Trucking/Hauling 1522 W. Kettelle St. Peoria, IL 61605	309-683-6931
<b>DECA Realty</b> Eddie J. Washington	MBE Real Estate Broker, Appraiser 417 W. Main, Peoria, IL 61606	309-637-3322 309-682-3922 Fax
<b>Design Air Inc.</b> Courtney Eston	MBE Commercial Air Duct Cleaning 3806 W. Hearthwood Dr., Dunlap, IL 61525	309-693-8632 309-243-2102 Fax
Dunbar Transfer	WBE Trucking P.O. Box 315, Chillicothe, IL 61523-0315	309-303-5122
E & D Trucking and Hauling, Inc. Eddie Proctor	MBE Trucking/Hauling 1913 N. Idaho, Peoria, IL 61604	309-682-4336 309-251-6736 Cell
Earth Care Unlimited, Inc. Monica Thomley	WBE Seeding, Sodding, Landscaping 3108 Panther Grove Rd., Ashland, IL 62612	217-452-7320 217-452-7178 Fax
Economy Painting & Decorating Linda Coffman	MBE Painting 9315 W. Goetz, Hanna City, IL 61536	309-565-7300
Elegant Installations James Barrett	MBE Installation/sales custom drapery, blinds, shade, shutters 125 E. Elaine, Peoria, IL 61614	309-648-8118 309-93-0007 Fax
Fashion Floors, Inc. Yvonne Hand	WBE Floorcoverings 930 S. 2 <sup>nd</sup> Street, Suite B, Pekin, IL 61554	309-353-8272 309-347-1109 Fax
Fire & Ice Heating and Air J.T. Toombs	MBE HVAC Maintenance, Installment 922 W. Smith St., Peoria, IL 61605	309-219-3708
Fuhrmann Engineering Inc. Kathy Shelter	WBE Civil Engineers / Land Surveyors 456 Fulton St., Suite 146	309-713-3498 Ext. 5
Flessner Electric	WBE Electrical 3600 S. Cameron Ln., Mapleton, IL 61547	309-697-2484
G&L Trucking & Construction	WBE 1113 W. Groveland Ave., Peoria, IL 61604	309-686-9334
Garza Heating & Cooling	MBE 1304 S. Western Ave., Peoria, IL 61605	309-645-6294
Ronald A. Givens & Associates Ronald A. Givens	MBE Insurance & Investments 2616 N. Lehman, Peoria, IL 61602	309-685-4588 309-676-3152 Fax
Gutters & More	WBE 157 Thunderbird Ln., East Peoria, IL 61611	309-694-4000 309-694-3356 Fax

Hancock Trucking, Inc. Nancy Hancock

Hanley Steel, Inc. Jill Hanley

Heart Technologies Jim Bainter, Brad Armstrong

Hermann & Associates Alisha Hermann

Hopgood Painting Bruce Hopgood

Horan Construction, Inc. Susan Arnholt

**Infrastructure Engineering** Thu Truitt

Intech Innovations John McCrary

J Construction Frank Coates

JAKS Construction Inc. John Spencer

**J. D. Masonry Services** Hurdestine Dabbs

J&J Manufacturing

J & J Construction Herman Johnson

J & K Construction James Tilman

JM Industrial Supply Ron Given

Joseph & Associates Construction Inc. Elva Jones

Kahbeah Contracting & Trucking Larry Kahbeah

Kreiling Roofing Co.

LNR Construction & Trucking Demonte Davis

**LV Enterprise** John L. Palmer

M & A Plumbing Michael Abner

McGinnis Transportation Beth McGinnis

M&K Heating & Cooling Reggie Williams WBE Trucking/Hauling 30570 Hancock Road Mackinaw, IL 61755

WBE Fabricated Structural and Miscellaneous Steel 8811 N. Industrial Rd., Peoria, IL 61615

WBE Data and Telephone, Communication and Construction 3105 N. Main Street, Peoria, IL 61611

WBE Consultant Engineering 5835 N. Galena Rd., Peoria, IL 61614

WBE Carpentry, Concrete, Demolition, General, Wrecking 1720 W. Chanute Road Peoria, IL 61615

MBE Civil Enineering 456 Fulton St., Suite 104, Peoria, IL 61602

WBE Audio/Video Design and Integration Washington, IL 61571

MBE General 1810 Stever, Peoria, IL 61605

Disabled Vet Concrete Cutting, Drilling, Sealing 19319 Great Crane Rd., Bloomington, IL 61705

M/WBE Concrete 907 E. Arcadia, Peoria, IL 61603

110 W. Walnut, Chillicothe, IL 61523

MBE Demolition, Excavation 1710 W. Garden Street, Peoria, IL 61605

MBE General 4003 N. Rochelle, Peoria, IL 61615

MBE Maintenance Items, Tools, Soaps 2323 Lakeshore, Pekin, IL 61554

M/WBE Rough and Finish Carpentry 325 Sanford St., East Peoria, IL 61611

MBE Trucking/Hauling 510 N. Yates, P. O. Box 56, Tallula, IL 62688

WBE Slate, Wood Shakes, Tile, Thatch, Custom Fabricated Copper and Steel, Residential and Commercial 2335 W. Altorfer Dr., Peoria, IL 61615

MBE Concrete, Trucking 2200 Linsley St., Peoria, IL 61604

MBE Trucking/Hauling 303 E. Archer Avenue, Peoria, IL 61603

MBE Plumbing 6216 N. Devonshire Avenue, Peoria, IL 61615

WBE Trucking, Tandem, 24 » Box Truck 336 Riverview Dr., Creve Cœur, IL 61610

MBE HVAC 2406 W. Newman Parkway, Peoria, IL 61604 309-447-6733

309-692-5250 309-692-5251 Fax

309-427-7000 309-427-7007 Fax

309-687-5566 309-687-0571 Fax

309-826-4981

309-691-3133 309-691-1841 Fax

309-637-9200 309-637-9210

309-370-6676 309-745-9691 Fax

309-303-3919 Cell

800-455-9662 309-455-9662 Fax

309-453-6533 Cell

209-274-3141

309-673-8616 309-676-8292 Fax

309-685-8554 309-685-8554 Fax

309-346-5796 309-347-5100 Fax

309-550-5639 309-282-6013Fax

217-634-4157 217-634-4157 Fax

309-673-3649

309-682-6331

309-657-2420 309-682-8872 Fax

309-689-0133 309-689-0133 Fax

309-369-4465 309-694-1604 Fax

309-256-6129

<b>M &amp; L Plumbing</b> Manzell Lawson	MBE Plumbing 1309 W. Lincoln, Peoria, IL 61605	309-674-8466
Mid-Illinois Companies, Corp.	WBE Metal Framing, Insulation, Drywall, Plaster and Exterior Insulation, Acoustical Ceilings and Wall Panels, Painting and Wall Covering, Access Flooring 905 NE Adams St., Peoria, IL 61603	309-674-0717 309-674-5802 Fas
Midwest Construction Services Sheila Shover	M/WBE Traffic Control Products, Trucking/Hauling P. O. Box 4185, Bartonville, IL 61607	309-697-1000 309-697-1004 Fax
Millennia Professional Services of IL Paul Moreno	MBE Civil Engineering, Erosion Control, Landscaping, Sewer Construction, Surveying, Retaining Walls 850 N. Main St., Morton, IL 61550	309-321-8141 309-321-8142
Molleck Electric	WBE Electrical 14926 W. Winchester Dr., Brimfield, IL 61517	309-446-3483
Ordaz Construction Co. Inc. Elizabeth Ordaz Mercer	WBE Concrete 8010 N. Sommer St., Peoria, IL 61615	309-693-3338 309-693-5505 Fax
Pendleton Excavating Darold Pendleton	MBE Excavation, Sand & Gravel 1207 W. MacQueen Peoria, IL 61605	309-685-9133 309-685-9133 Fax
<b>Porter, V. L.</b> Vincent Porter	MBE Concrete, General 500 W. North, Suite 10, Springfield, IL 62704	217-744-8050
RNS Electric Inc. Regina Slonneger	WBE Electrical 28558 Irish Lane, Washington, IL 61571	309-444-5200 309-444-5201 Fax
<b>RTM Concrete Construction</b> Morris Stokes	MBE Concrete 2207 W. Wiswall, Peoria, IL 61605	309-637-4237
<b>N. E. Rudd Trucking</b> Nanette Jenkins-Rudd	WBE Trucking/Hauling P.O. Box 14, 107 Washington St., Kingston Mines, IL 61539	309-389-4150 309-389-2849 Fax
Nelton Construction Damon Nelton	MBE Concrete, Residential and Commercial Construction 1180 Upper Spring Bay Rd., East Peoria, IL 61611	309-694-9837 309-694-9852 Fax
<b>Professional Contracting Services Inc.</b> Don Mackey	MBE Concrete, Masonry, Carpentry, Site Work 2669 N. County Hwy. 19, Canton, IL 61520	309-647-9744 309-208-7089 Cell
Ridge Painting Vickie Ridge	MBE Painting 4216 N. Patricia Ct., Peoria, IL 61615	309-688-5610
<b>Rufus Construction Company</b> Rufus Nelson	MBE Painting, Roofing, Remodeling 1819 S. Idaho Street, Peoria, IL 61605	309-673-6776 309-497-9453 Cell
<b>Searle Trucking, Inc.</b> Debbie Searle	WBE Trucking/Hauling P. O. Box 1084, Peoria, IL 61653	309-686-0708 309-688-5365 Fax
Sherwin Baker & Associates, Inc. Sherwin Baker	MBE Construction Management, Consulting, Engineering, Technical Services 103 E. Archer, Peoria, IL 61603	309-688-4203 309-688-4203 Fax
Smeltz, V.	MBE Excavation P. O. Box 64, Washington, IL 61571	
<b>Tabitha Ventures, Inc.</b> Edward O. Taiwo	MBE Asphalt, Concrete, Demolition, Earthwork, Electrical, Excavation, General, HVAC, Landscaping, Painting, Plumbing, Resurfacing, Roofing, Trucking/Hauling 2000 W. Pioneer Parkway, Suite 7B, Peoria, IL 61615	309-692-1473 309-692-1564 Fax
<b>The Communication Connection</b> Jennifer Stone	WBE Communication, Wire and Cable, Electrical and Telephone Produ 604 Filmore Street Harrisburg, PA 17104	cts 717-561-7267
Three Cross Development	MBE Concrete, General, Sidewalk	309-637-1238

1519 W. Millman Peoria, IL 61605

J. T. Donelson

Third Hand Landscaping Tommy Harris	MBE Landscaping 2313 W. Lincoln, Peoria, IL 61605	309-673-6702		
<b>Thompson Brothers Inc.</b> Todd Thompson	MBE General Carpentry and Construction, Interior Finish Work, Millwork 221 Court St., Pekin, IL 61554	309-613-0254		
<b>Thornton Rave</b> dba Illini Concrete Co. of Illinois	MBE Precast and Prestressed Concrete, Demolition, Excavating and Grading, Drainage, Aggregate Bases and Surfaces, Pavement Patching 929 E. Grove St., Suite A, Bloomington, IL 61701	309-585-2376 309-585-2472 Fax		
<b>Tilman Electric</b>	MBE Electrical	309-685-8554		
James Tilman	4003 N. Rochelle, Peoria, IL 61615	309-264-3903 Cell		
TOS Trucking John McCullum	MBE Trucking 11501 Farmington Rd., Hanna City, IL 61536	309-208-1927		
Wards Custom Landscaping	MBE Landscaping	309-671-1890		
Wardine Smith	3804 W. Pagewood Dr., Peoria, IL 61615	309-671-1893 Fax		
Whitaker Construction	MBE Concrete, General, Curb & Gutter, Sidewalk	309-682-9305		
Lionel Whitaker	4010 N. Marbleway Dr., Peoria, IL 61615	309-208-0476 Cell		
Wiegand & Storrer Inc.	WBE Horizontal Boring, Sewer, Watermain	309-699-6457		
Leslie Savant	3210 E. Washington Road, East Peoria, IL 61611	309-699-9660 Fax		
Willie Veneble Construction	MBE Construction, Concrete Removal, Demolition	309-686-1429		
Willie Venable	1000 E. Wilcox, Peoria, IL 61605	309-360-0757 Cell		
Willis Electric Phyllis Willis	WBE Electrical P.O. Box 545, Chillicothe, IL 61523	309-579-2926		

# Peoria County Prevailing Wage for July 2015

### (See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	С	Base	FRMAN 1	M-E>8	OSA	OSH	H/W	Pensn	Vac	Trng		
	==	===	=	======	======	=====	. ===	===	=====	=====				
ASBESTOS ABT-GEN		BLD		26.700	28.200	1.5	1.5	2.0	7.700	16.21	0.000	0.800		
ASBESTOS ABT-GEN		HWY		29.910	31.410	1.5	1.5	2.0	1./00	1/.4/	0.000	0.800		
ASBESTOS ABT-MEC		RTD		32.510	35.UIU	1.5	1.5	2.0	11.4/	10.96	0.000	0.720		
BUILERMARER		вгр		20.000	41.000	2.0	2.0	2.0	0.070	15.99	0.000	0.400		
CARDENTER		עתם		30 880	33 130	1.5	1.5	2.0	8 000	9.070	0.000	0.590		
CARPENTER		HWY		32 700	34 950	1 5	1 5	2.0	8 000	15 81	0.000	0.520		
CEMENT MASON		BT.D		28 050	29 800	1 5	1 5	2.0	7 500	15.65	0.000	0.520		
CEMENT MASON		HWY		29 280	30 780	1 5	1 5	2 0	7 500	16 02	0.000	0.500		
CERAMIC TILE FNSHER		BLD		29.890	0.000	1.5	1.5	2.0	8.600	10.05	0.000	0.580		
ELECTRIC PWR EQMT OP		ALL		38.300	45.290	1.5	1.5	2.0	6.150	10.73	0.000	0.380		
ELECTRIC PWR GRNDMAN		ALL		26.280	45.290	1.5	1.5	2.0	5.790	7.360	0.000	0.260		
ELECTRIC PWR LINEMAN		ALL		42.540	45.290	1.5	1.5	2.0	6.280	11.92	0.000	0.430		
ELECTRIC PWR TRK DRV		ALL		27.560	45.290	1.5	1.5	2.0	5.830	7.720	0.000	0.280		
ELECTRICIAN		ALL		34.820	37.320	1.5	1.5	2.0	6.500	11.68	0.000	0.800		
ELECTRICIAN		BLD		34.820	37.320	1.5	1.5	2.0	6.100	11.43	0.000	0.400		
ELECTRONIC SYS TECH		BLD		28.250	30.250	1.5	1.5	2.0	6.350	10.54	0.000	0.400		
ELEVATOR CONSTRUCTOR		BLD		41.690	46.900	2.0	2.0	2.0	13.57	14.21	3.340	0.600		
GLAZIER		BLD		31.870	33.870	1.5	1.5	1.5	10.25	7.700	0.000	1.250		
HT/FROST INSULATOR		BLD		43.350	45.850	1.5	1.5	2.0	11.4/	12.36	0.000	0.720		
IRON WORKER		BLD		32.190	34.090	0.0	0.0	0.0	9.490	13.91	0.000	0.000		
IRON WORKER		HWI		35.980	37.980	1 5	1 5	2.0	9.490	16 21	0.000	0.000		
LABORER		HWV		29.160	30 660	1.5	1.5	2.0	7 700	17 17	0.000	0.800		
LABORER SKILLED		BT.D		26 100	27 600	1 5	1 5	2.0	7 700	16 21	0.000	0.000		
LABORER, SKILLED		HWY		29 460	30 960	1 5	1 5	2 0	7 700	17 47	0 000	0 800		
LATHER		BLD		30.880	33.130	1.5	1.5	2.0	8.000	15.71	0.000	0.520		
MACHINERY MOVER		HWY		35.980	37.980	0.0	0.0	0.0	9.490	13.91	0.000	0.000		
MACHINIST		BLD		45.350	47.850	1.5	1.5	2.0	7.260	8.950	1.850	0.000		
MARBLE FINISHERS		BLD		29.890	0.000	1.5	1.5	2.0	8.600	10.05	0.000	0.580		
MARBLE MASON		BLD		31.650	32.900	1.5	1.5	2.0	8.600	10.05	0.000	0.580		
MILLWRIGHT		BLD		31.060	33.310	1.5	1.5	2.0	8.000	15.87	0.000	0.520		
MILLWRIGHT		HWY		33.060	35.310	1.5	1.5	2.0	8.000	15.95	0.000	0.520		
OPERATING ENGINEER		BLD	1	37.050	40.050	1.5	1.5	2.0	7.000	17.48	0.000	3.000		
OPERATING ENGINEER		BLD	2	34.450	40.050	1.5	1.5	2.0	7.000	17.48	0.000	3.000		
OPERATING ENGINEER		BLD	3	30.160	40.050	1.5	1.5	2.0	7.000	17.48	0.000	3.000		
OPERATING ENGINEER		HWY	7	38.150	41.150	1.5	1.5	2.0	7.250	10.23	0.000	3.000		
OPERATING ENGINEER		HWY	2	35.460	41.150	1.5	1.5	2.0	7.250	10.23	0.000	3.000		
DAINTED		ATT	5	33 650	35 650	1.5	1.5	1 5	10 30	8 200	0.000	1 350		
PAINTER SIGNS		RT.D		33 920	38 090	1 5	1 5	1 5	2 600	2 710	0.000	0 000		
PILEDRIVER		BLD		31.880	34.130	1.5	1.5	2.0	8.000	15.71	0.000	0.520		
PILEDRIVER		HWY		33.700	35.950	1.5	1.5	2.0	8.000	15.81	0.000	0.520		
PIPEFITTER		BLD		37.400	41.510	1.5	1.5	2.0	7.000	11.63	0.000	1.060		
PLASTERER		BLD		28.140	29.770	1.5	1.5	2.0	7.500	15.00	0.000	0.870		
PLUMBER		BLD		34.520	37.630	1.5	1.5	2.0	7.000	13.86	0.000	0.950		
ROOFER		BLD		30.580	32.110	1.5	1.5	2.0	8.450	7.220	0.000	0.250		
SHEETMETAL WORKER		BLD		32.430	34.050	1.5	1.5	2.0	9.120	15.55	0.000	0.780		
SIGN HANGER		HWY		35.980	37.980	0.0	0.0	0.0	9.490	13.91	0.000	0.000		
SPRINKLER FITTER		BLD		37.120	39.870	1.5	1.5	2.0	8.420	8.500	0.000	0.350		
STEEL ERECTOR		HWY		35.980	37.980	0.0	0.0	0.0	9.490	13.91	0.000	0.000		
STONE MASON		BLD		32.380	33.880	1.5	1.5	2.0	8.600	9.870	0.000	0.590	c 0 000	0 000
SURVEY WORKER -	·> r	. 'I'ON	LN	EFFECT	ALL 0 000	28.	900 :	30.40	JU 1.5	10 05	2.0 /.	.700 14.8	0.000	0.800
TERRAZZO FINISHER		вгр		29.090	32 000	1.5	1.5	2.0	8.600	10.05	0.000	0.580		
TILE MASON		BID		31 650	32.900	1.5	1.5	2.0	8 600	10.05	0.000	0.580		
TRUCK DRIVER		AT.T.	1	33,000	36.550	1.5	1 5	2.0	11 10	5.230	0.000	0.250		
TRUCK DRIVER		AT.T.	2	33.480	36.550	1.5	1.5	2.0	11.10	5.230	0.000	0.250		
TRUCK DRIVER		ALL	3	33.700	36.550	1.5	1.5	2.0	11.10	5.230	0.000	0.250		
TRUCK DRIVER		ALL	4	34.010	36.550	1.5	1.5	2.0	11.10	5.230	0.000	0.250		
TRUCK DRIVER		ALL	5	34.900	36.550	1.5	1.5	2.0	11.10	5.230	0.000	0.250		
TRUCK DRIVER		O&C	1	27.280	30.220	1.5	1.5	2.0	11.40	5.440	0.000	0.250		
TRUCK DRIVER		O&C	2	27.680	30.220	1.5	1.5	2.0	11.40	5.440	0.000	0.250		
TRUCK DRIVER		O&C	3	27.860	30.220	1.5	1.5	2.0	11.40	5.440	0.000	0.250		

TRUCK DRIVER	0&C 4	28.110	30.220	1.5	1.5	2.0	11.40	5.440	0.000	0.250
TRUCK DRIVER	0&C 5	28.850	30.220	1.5	1.5	2.0	11.40	5.440	0.000	0.250
TUCKPOINTER	BLD	32.380	33.880	1.5	1.5	2.0	8.600	9.870	0.000	0.590

LEGENIC: RG (Region) TYP (Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers) C (Class) Base (Base Wage Rate) FFNAN (Foreman Rate) M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri. OSA (Overtime (OT) is required for every hour worked on Saturday) OSH (Overtime is required for every hour worked on Sunday and Holidays) H/W (Health & Welfare Insurance) Pensn (Pension) Vac (Vacation) Trng (Training)

#### Explanations

PEORIA COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

Oil and chip resealing (O&C) means the application of road oils and liquid asphalt to coat an existing road surface, followed by application of aggregate chips or gravel to coated surface, and subsequent rolling of material to seal the surface.

#### EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER, MARBLE FINISHER, TERRAZZO FINISHER

Assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments required to complete the proper installation of the work covered by said crafts. The term "Ceramic" is used for naming the classification only and is in no way a limitation of the product handled. Ceramic takes into consideration most hard tiles.

#### ELECTRONIC SYSTEMS TECHNICIAN

Installation, service and maintenance of low-voltage systems which utilizes the transmission and/or transference of voice, sound, vision, or digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background/foreground music, intercom and telephone interconnect, field programming, inventory control systems, microwave transmission, multi-media, multiplex, radio page, school, intercom and sound burglar alarms and low voltage master clock systems.

Excluded from this classification are energy management systems, life safety systems, supervisory controls and data acquisition systems not intrinsic with the above listed systems, fire alarm systems, nurse call systems and raceways exceeding fifteen feet in length.

LABORER, SKILLED - BUILDING

The skilled laborer building (BLD) classification shall encompass the following types of work, irrespective of the site of the work: cutting & acetylene torch, gunnite nozzlemen, gunnite pump men & pots, kettlemen & carriers of men handling hot stuff, sandblaster nozzle men, sandblasting pump men & pots, setting up and using concrete burning bars, wood block setters, underpinning & shoring of existing buildings, and the unload-ing and handling of all material coated with creosote.

The skilled laborer heavy & highway (HWY) classification shall encompass the following types of work,irrespective of the site of the work: jackhammer & drill operator, gunite pump & pot man, puddlers, vibrator men, wire fabric placer, sandblast pump & pot man, strike off concrete, unloading, handling & carrying of all creosoted piles, ties or timber, concrete burning bars, power wheelbarrows or buggies, asphalt raker, brickset-ters, cutting torchman (electric & acetylene), men setting lines to level forms, form setters, gunite nozzle man & sandblasting nozzle man, power man, and rip-rapping by hand.

SURVEY WORKER - Operated survey equipment including data collectors, G.P.S. and robotic instruments, as well as conventional levels and transits.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION Class 1. Drivers on 2 axle trucks hauling less than 9 ton. Air compressor and welding machines and brooms, including those pulled by separate units, truck driver helpers, warehouse employees, mechanic helpers, greasers and tiremen, pickup trucks when hauling materials, tools, or workers to and from and on-the-job site, and fork lifts up to 6,000 lb. capacity.

Class 2. Two or three axle trucks hauling more than 9 ton but hauling less than 16 ton. A-frame winch trucks, hydrolift trucks, vactor trucks or similar equipment when used for transportation purposes. Fork lifts over 6,000 lb. capacity, winch trucks, four axle combination units, and ticket writers.

Class 3. Two, three or four axle trucks hauling 16 ton or more. Drivers on water pulls, articulated dump trucks, mechanics and working forepersons, and dispatchers. Five axle or more combination units.

Class 4. Low Boy and Oil Distributors.

Class 5. Drivers who require special protective clothing while employed on hazardous waste work.

TRUCK DRIVER - OIL AND CHIP RESEALING ONLY.

This shall encompass laborers, workers and mechanics who drive contractor or subcontractor owned, leased, or hired pickup, dump, service, or oil distributor trucks. The work includes transporting materials and equipment (including but not limited to, oils, aggregate supplies, parts, machinery and tools) to or from the job site; distributing oil or liquid asphalt and aggregate; stock piling material when in connection with the actual oil and chip contract. The Truck Driver (Oil & Chip Resealing) wage classification does not include supplier delivered materials.

#### OPERATING ENGINEERS - BUILDING

Class 1. Cranes; Overhead Cranes; Gradall; All Cherry Pickers; Mechanics; Central Concrete Mixing Plant Operator; Road Pavers (27E -Dual Drum - Tri Batchers); Blacktop Plant Operators and Plant Engineers; 3 Drum Hoist; Derricks; Hydro Cranes; Shovels; Skimmer Scoops; Koehring Scooper; Drag Lines; Backhoe; Derrick Boats; Pile Drivers and Skid Rigs; Clamshells; Locomotive Cranes; Dredge (all types) Motor Patrol; Power Blades - Dumore - Elevating and similar types; Tower Cranes (Crawler-Mobile) and Stationary; Crane-type Backfiller; Drott Yumbo and similar types considered as Cranes; Caisson Rigs; Dozer; Tournadozer; Work Boats; Ross Carrier; Helicopter; Tournapulls - all and similar types; Scoops (all sizes); Pushcats; Endloaders (all types); Asphalt Surfacing Machine; Slip Form Paver; Rock Crusher; Heavy Equipment Greaser; CMI, CMI Belt Placer, Auto Grade & 3 Track and similar types; Side Booms; Multiple Unit Earth Movers; Creter Crane; Trench Machine; Pump-crete-Belt Crete-Squeeze Cretes-Screw-type Pumps and Gypsum; Bulker & Pump Operator will clean; Formless Finishing Machine; Flaherty Spreader or similar types; Screed Man on Laydown Machine; Wheel Tractors (industrial or Farm-type w/Dozer-Hoe-Endloader or other attachments); F.W.D. & Similar Types; Vermeer Concrete Saw.

Class 2. Dinkeys; Power Launches; PH One-pass Soil Cement Machine (and similar types); Pugmill with Pump; Backfillers; Euclid Loader; Forklifts; Jeeps w/Ditching Machine or other attachments; Tuneluger; Automatic Cement and Gravel Batching Plants; Mobile Drills (Soil Testing) and similar types; Gurries and Similar Types; (1) and (2) Drum Hoists (Buck Hoist and Similar Types); Chicago Boom; Boring Machine & Pipe Jacking Machine; Hydro Boom; Dewatering System; Straw Blower; Hydro Seeder; Assistant Heavy Equipment Greaser on Spread; Tractors (Track type) without Power Unit pulling Rollers; Rollers on Asphalt -- Brick Macadem; Concrete Breakers; Concrete Spreaders; Mule Pulling Rollers; Center Stripper; Cement Finishing Machine; Barber Green or similar loaders; Vibro Tamper (All similar types) Self-propelled; Winch or Boom Truck; Mechanical Bull Floats; Mixers over 3 Bag to 27E; Tractor pulling Power Blade or Elevating Grader; Porter Rex Rail; Clary Screed; Truck Type Hoptoe Oilers; Fireman; Spray Machine on Paving; Curb Machines; Truck Crane Oilers; Oil Distributor; Truck-Mounted Saws.

Class 3. Air Compressor; Power Subgrader; Straight Tractor; Trac Air without attachments; Herman Nelson Heater, Dravo, Warner, Silent Glo, and similar types; Roller: Five (5) Ton and under on Earth or Gravel; Form Grader; Crawler Crane & Skid Rig Oilers; Freight Elevators - permanently installed; Pump; Light Plant; Generator; Conveyor (1) or (2) - Operator will clean; Welding Machine; Mixer (3) Bag and Under (Standard Capacity with skip); Bulk Cement Plant; Oiler on Central Concrete Mixing Plant.

#### OPERATING ENGINEERS - HEAVY AND HIGHWAY CONSTRUCTION

CLASS 1. Cranes; Hydro Cranes; Shovels; Crane Type Backfiller; Tower, Mobile, Crawler, & Stationary Cranes; Derricks; Hoists (3 Drum); Draglines; Drott Yumbo & Similar Types considered as Cranes; 360 Degree Swing Excavator (Shears, Grapples, Movacs, etc.); Back Hoe; Derrick Boats; Pile Driver and Skid Rigs; Clam Shell; Locomotive Cranes; Road Pavers - Single Drum - Dual Drum - Tri Batcher; Motor Patrols & Power Blades - Dumore - Elevating & Similar Types; Mechanics; Central Concrete Mixing Plant Operator; Asphalt Batch Plant Operators and Plant Engineers; Gradall; Caisson Rigs; Skimmer Scoop -Koering Scooper; Dredges (all types); Hoptoe; All Cherry Pickers; Work Boat; Ross Carrier; Helicopter; Dozer; Tournadozer; Tournapulls all and similar types; Operation of Concrete and all Recycle Machines; Multiple Unit Earth Movers; Scoops (all sizes); Pushcats; Endloaders (all types); Asphalt Surfacing Machine; Slip Form Paver; Rock Crusher; Operation of Material Crusher, Screening Plants, and Tunnel Boring Machine; Heavy Equipment Greaser (top greaser on spread); CMI, Auto Grade, CMI Belt Placer & 3 Track and Similar Types; Side Booms; Asphalt Heater & Planer Combination (used to plane streets); Wheel Tractors (with Dozer, Hoe or Endloader Attachments); CAT Earthwork Compactors and Similar Types; Blaw Knox Spreader and Similar Types; Trench Machines; Pump Crete - Belt Crete - Squeeze Crete - Screw Type Pumps and Gypsum (operator will clean); Creter Crane; Operation of Concrete Pump Truck; Formless Finishing Machines; Flaherty Spreader or Similar Types; Screed Man on Laydown Machine; Vermeer Concrete Saw; Operation of Laser Screed; Span Saw; Dredge Leverman; Dredge Engineer; Lull or Similar Type; Hydro-Boom Truck; Operation of Guard Rail Machine; and Starting Engineer on Pipeline or Construction (11 or more pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted - Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc, and Ground Heater (Trailer Mounted).

CLASS 2. Bulker & Pump; Power Launches; Boring Machine & Pipe Jacking Machine; Dinkeys; Operation of Carts, Powered Haul Unit for a Boring Machine; P & H One Pass Soil Cement Machines and Similar Types; Wheel Tractors (Industry or Farm Type - Other); Back Fillers; Euclid Loader; Fork Lifts; Jeep w/Ditching Machine or Other Attachments; Tunneluger; Automatic Cement & Gravel Batching Plants; Mobile Drills - Soil Testing and Similar Types; Pugmill with Pump; All (1) and (2) Drum Hoists; Dewatering System; Straw Blower; Hydro-Seeder; Bump Grinders (self-propelled); Assistant Heavy Equipment Greaser; Apsco Spreader; Tractors (Track-Type) without Power Units Pulling Rollers; Rollers on Asphalt - Brick or Macadam; Concrete Breakers; Concrete Spreaders; Cement Strippers; Cement Finishing Machines & CMI Texture & Reel Curing Machines; Vibro-Tampers (All Similar Types Self-Propelled); Mechanical Bull Floats; Self-Propelled Concrete Saws; Truck Mounted Power Saws; Operation of Curb Cutters; Mixers - Over Three (3) Bags; Winch and Boom Trucks; Tractor Pulling Power Blade or Elevating Grader; Porter Rex Rail; Clary Screed; Mule Pulling Rollers; Pugmill without Pump; Barber Greene or Similar Loaders; Track Type Tractor w/Power Unit attached (minimum); Fireman; Spray Machine on Paving; Curb Machines; Paved Ditch Machine; Power Broom; Self-Propelled Sweepers; Self-Propelled Conveyors; Power Subgrader; Oil Distributor; Straight Tractor; Truck Crane Oiler; Truck Type Oilers; Directional Boring Machine; Horizontal Directional Drill; Articulating End Dump Vehicles; Starting Engineer on Pipeline or Construction (6 -10 pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted - Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc., and Ground Heater (Trailer Mounted).

CLASS 3. Straight Framed Truck Mounted Vac Unit (separately powered); Trac Air Machine (without attachments); Rollers - Five Ton and Under on Earth and Gravel; Form Graders; Bulk Cement Plant; Oilers; and Starting Engineer on Pipeline or Construction (3 - 5 pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted -Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc., and Ground Heater (Trailer Mounted).

#### Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

#### LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.
# SAMPLE ADDENDUM

Peoria Park District Planning, Design and Construction Department 1314 N. Park Road Peoria, IL 61604 Telephone: (309) 686-3386 ADDENDUM NO.

PROJECT TITLE:

**ISSUANCE DATE:** 

LOCATION:

The proposed Contract Documents for this Work are modified as follows:

- I. **<u>DRAWINGS</u>**: (Delete/Change/Modify/Etc.)
- II. <u>**PROJECT MANUAL/SPECIFICATIONS/GENERAL CONDITIONS/ETC**</u>.: (Delete/Change/Modify/Etc.)
- III. **<u>INVITATION TO BID</u>**: (Delete/Change/Modify/Etc.)

END OF ADDENDUM NO.

(Addendum may be bound into Project Manual, attached to front cover, faxed, mailed or delivered to bidders.)

Addendum No. \_\_\_\_\_ Page 1 of 1

PEORIA ZOO TAKIN ENCLOSURE - Project Manual



# Pleasure Driveway and Park District of Peoria, Illinois Sample Agreement Between Owner and Contractor

This <b>AGREEMENT</b> for	PEORIA ZOO TAKIN ENCLOSURE		
is made as of the day of	of in the year of Two Thousand Fifteen (2015)		
Between the Owner:	PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, ILLINOIS 1125 W. LAKE AVENUE PEORIA, IL 61614		
And the Contractor:			
The Owner's Representativ	PLANNING, DESIGN AND CONSTRUCTION DEPARTMENT 1314 N. PARK ROAD PEORIA, IL 61604		
APACE DESIGN ARCHITECTS & ENGINEERS2112 E. WAR MEMORIAL DR.PEORIA, IL 61614			

The Owner and Contractor agree as follows:

**I. THE CONTRACT DOCUMENTS.** The Contract Documents consist of this AGREEMENT, the Plans/Drawings for the Project dated September 29, 2015, all sections of the Project Manual dated October 27, 2015, including but not limited to the Instructions and Supplementary Instructions to Bidders, the Bid Form, the General Conditions (1997 AIA Document A201) and Supplementary General Conditions, the General Requirements, the Specifications, and other documents as enumerated in Section 10 and Attachment #1 of this AGREEMENT, and including addenda issued prior to the execution of this AGREEMENT. The Contract Documents form the CONTRACT between the Owner and the Contractor. The CONTRACT represents the entire and integrated contract for the construction of the Work of the Project between the parties hereto and supersedes prior proposals, contracts, negotiations, or representations, either written or oral.

**II. THE WORK OF THE CONTRACT.** The Contractor shall execute the entire Work described in the Contract Documents, unless modified in Section XI of this AGREEMENT.

**III. BASIS OF PAYMENT.** The Work of the CONTRACT shall be performed on a lump sum basis.

(and incorporates the acceptance of bid alternates as defined in sub-paragraph "A", below) for the Contractor's performance of the Work required by the Contract Documents, subject to modifications made by Owner approved Change Orders. If this CONTRACT calls for a unit price basis of payment, the contract sum stated above shall be adjusted by Change Order based upon multiplying the unit prices submitted by the Contractor on the Bid Form (and included herein as an Attachment to this CONTRACT) times (x) the actual quantities installed.

following	alternates, which are described	in the Project Manual:	-
	ITEM	ADD	DEDUCT

**V. DATES OF COMMENCEMENT AND COMPLETION OF THE WORK.** The Owner's Representative will issue a written Notice to Proceed with the Work of the Project after receiving the required Performance Bond, Labor and Material Payment Bond, and Certificate of Insurance (in proper form and providing the required coverages and amounts from a company [or companies] acceptable to the Owner, and naming the Owner as an Additional Insured), and any other pre-construction submittals required by the Contract Documents. The Contractor hereby acknowledges and agrees that failure to provide such submittals in a timely manner shall not be cause to adjust the date(s) for completion of the Work.

- A. LIQUIDATED DAMAGES. Owner and Contractor recognize that time is of the essence of this CONTRACT and that Owner will suffer financial loss if the Contractor has not achieved Substantial Completion and Final Completion of the Work within the time specified below, plus any extensions thereof allowed in accordance with Article 8 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time.
- B. SUBSTANTIAL COMPLETION. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as Liquidated Damages for delay (but not as a penalty), Contractor shall pay Owner TWO HUNDRED AND FIFTY dollars (\$250.00) for each calendar day that expires after two hundred sixty one (261) calendar days from Notice of Award until Substantial Completion is attained. The work is tentatively scheduled to begin on December 10, 2015 and be at Substantial Completion by August 26, 2016.
- C. FINAL COMPLETION. After Substantial Completion if Contractor shall neglect, refuse, or fail to complete the remaining Work necessary to achieve Final Completion within fourteen (14) calendar days or any proper extension thereof granted by Owner, Contractor shall pay Owner TWO HUNDRED AND FIFTY dollars (\$250.00) for each day that expires after the time specified.

# VI. PROGRESS PAYMENTS, REDUCTION OF RETAINAGE AND FINAL PAYMENT.

A. Unless otherwise specified elsewhere in the Contract Documents, the Contractor may submit monthly applications for progress payments ("Application for Payment") to the Owner's Representative. Each Application for Payment must be certified by the Architect or Engineer (if applicable), or the Owner's Representative if an Architect or Engineer has not been engaged for construction phase services. An Application for Payment shall be for a period of no less than one calendar month ending on the last day of the month, unless otherwise approved in writing by the Owner's Representative. Application for Payment shall be subject to Owner's approval. Each Application for Payment shall be based upon the Schedule of Values submitted by the Contractor, in accordance with the Contract Documents. The Schedule of Values shall be approved by the Owner's Representative and the Architect or Engineer (if applicable) in advance of the Contractor's first Application for Payment and the approved schedule shall be used by the Contractor as the basis for submitting payment requests. The Owner's Representative and/or

Architect/Engineer's (if applicable) approval of the Schedule of Values shall not constitute a complete check for accuracy, and shall not relieve the Contractor from responsibility for errors of any sort.

- **B.** An Application for Payment (certified by the Architect or Engineer, if applicable) shall be submitted to the Owner's Representative no later than the fifth (5th) day of the month following the period for which the application is being submitted. In such case, the Owner shall make the progress payment to the Contractor not later than the twentieth day of the next month. A progress payment request on an Application for Payment (certified by the Architect or Engineer, if applicable) received by the Owner's Representative after the fifth (5th) day of a month shall be made by the Owner not later than forty-five days after receipt by the Owner's Representative.
- C. Based upon its review of the certified (by the Architect or Engineer, if applicable) Application for Payment, the Owner shall make a progress payment to the Contractor in such amount as the Owner reasonably determines is properly due, subject to a retainage of ten percent (10%) of the value of the Work completed and covered by the Application for Payment, less the aggregate of previous payments in each case. In determining the amount properly due, the Owner shall consider the value of labor, materials and equipment incorporated in the Work, or properly allocable to materials and equipment suitably stored at the site or at some other location previously agreed upon in writing by the parties. The Owner's Representative shall have the sole right to determine that materials or equipment stored off-site have been properly delivered, protected, and/or secured. The Owner's Representative (or the Architect or Engineer, if applicable) may nullify or withhold a Certificate of Payment, in whole or in part, for the reasons set forth in Section 9.5 of the General Conditions. Upon Substantial Completion of the Work, the Owner shall pay the Contractor a sum sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Owner's Representative shall determine for incomplete work and unsettled claims.

**VII.** Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner when **1**) the Contract has been fully performed by the Contractor except for the Contractor's responsibility to correct nonconforming Work as provided in Subparagraph 12.2.2 of the General Conditions and to satisfy other requirements, if any, which necessarily survive final payment; and **2**) a final Certificate of Payment has been issued by the Architect/Engineer or Owner's Representative; such final payment shall be made by the Owner not more than forty-five (45) days after the receipt of the final Certificate of Payment by the Owner.

VIII. CHANGE ORDERS. The Owner and Contractor agree that changes in the Work are sometimes required and necessary, and that timely: **a**) submission of proposed changes in the Work or the scope of Work by the Owner, **b**) pricing by the Contractor, **c**) review by the Owner's Representative and/or Architect/Engineer, and **d**) final approval by the Owner are necessary in order to assure that the Work of the Project is completed on schedule. <u>The Contractor hereby acknowledges and agrees that an increase in the scope of the Work does not grant or imply an increase in the Contract Time, unless specifically so stated on the final approved Change Order. The Contractor also agrees that any and all Work which deviates from the plans and specifications and/or results in additional Work performed by Contractor's forces, including those of his sub-contractor's, will not result in additional expense to the Owner, unless **finally approved both by the Owner and the Architect/Engineer (if applicable) prior to the additional Work being performed. No claim for an addition to the Contract Sum shall be valid unless approved by a written Change Order signed by the Owner and the architect/engineer (if applicable) prior to the additional Work being performed.</u>** 

**IX. TERMINATION OR SUSPENSION.** The CONTRACT may be terminated by the Owner or the Contractor as provided by Article 14 of the General Conditions. The Work may be suspended by the Owner as provided in Article 14 of the General Conditions.

# **X. ENUMERATION OF CONTRACT DOCUMENTS.** The Contract Documents, except for modifications issued after the execution of this Agreement, consist of:

- A. this Standard Form of Agreement Between Owner and Contractor, of the Pleasure Driveway and Park District of Peoria, Illinois.
- **B.** the Plans or Drawings titled Peoria Zoo Takin Enclosure, dated September 29, 2015, and enumerated in ATTACHMENT #1 "LIST OF DRAWINGS".
- **C.** Supplementary and other Conditions of the CONTRACT, and the Specifications, are those found in the Project Manual titled "Peoria Zoo Takin Enclosure", and dated October 27, 2015, enumerated as follows:
  - 1) Supplementary Instructions to Bidders
  - 2) Contractor's Proposal, as accepted by the Owner
  - 3) General Conditions of the Contract for Construction, AIA Document A201, 1997 Edition
  - 4) Supplementary General Conditions
  - 5) Major Subcontractor List
  - 6) Directory of Minority & Women Owned Business Enterprises
  - 7) Illinois Drug Free Workplace Certification
  - 8) Contractor Certification (Individual or Corporate/Partnership)
  - 9) Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors
  - **10)** Workforce Profile
  - 11) Performance Bond
  - 12) Labor and Material Payment Bond
  - 13) Proof of Insurance
  - 14) Specifications: Division 010000, "General Requirements"; Divisions 020000-350000 as applicable
  - 15) Attachment A.6 Insurance Requirements
  - 16) Certificate of Safety Compliance
  - 17) Peoria Park District Weekly Workforce Report
  - **18**) Certified Payroll Form
  - 19) Substance Abuse Prevention Program Certification

## XI. MISCELLANEOUS PROVISIONS. Other Provisions of this Agreement are as follows:

This AGREEMENT is entered into as of the day and year first written above and is executed in at least three original copies of which one is to be delivered to the Contractor, one to the Architect/Engineer (if any) for use in the administration of the CONTRACT, and one to the Owner.

 OWNER:
 CONTRACTOR :

 (Signature)
 (Signature)

 TIMOTHY J. CASSIDY, Park Board President
 (Printed Name and Title)

ATTEST:

ATTEST:

# ATTACHMENT #1 - LIST OF DRAWINGS

<u>Number</u>	<u>Title</u>	Date
G000	TITLE SHEET	9/29/15
C100	ROUGH GRADING PLAN	9/29/15
C101	SITE DETAILS	9/29/15
S001	STRUCTURAL GENERAL NOTES	9/29/15
S101	FOUNDATION PLAN	9/29/15
S201	ROOF FRAMING PLAN	9/29/15
S202	GUARD FRAMING PLAN	9/29/15
S301	FOUNDATION DETAILS	9/29/15
S302	FOUNDATION DETAILS	9/29/15
S401	FRAMING DETAILS	9/29/15
A001	SCHEDULES AND DETAILS	9/29/15
A100	FLOOR PLAN	9/29/15
A101	ROOF PLAN	9/29/15
A200	ELEVATIONS	9/29/15
A300	BUILDING SECTIONS	9/29/15
A301	BUILDING SECTIONS	9/29/15
A400	REFLECTED CEILING PLAN	9/29/15
A500	WALL SECTIONS	9/29/15
A501	SECTIONS AND DETAILS	9/29/15
P100	PLUMBING PLAN AND DETAILS	9/29/15
H100	HVAC PLAN	9/29/15
H200	HVAC SECTIONS	9/29/15
E001	ELECTRICAL SITE PLAN	9/29/15
E100	<b>REVISED ELECTRICAL PLANS</b>	9/29/15
E200	SCHEDULES AND DETAILS	9/29/15
E300	LIGHTING MATERIAL SCHEDULES	
	AND GENERAL NOTES	9/29/15

# **PERFORMANCE BOND**

## TO: PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA PEORIA, ILLINOIS

#### KNOW ALL MEN BY THEIR PRESENTS;

That	
as Principal, and	
	as
corporation of the State of	, as Surety, are held and firmly bound unto the
PLEASURE DRIVEWAY	AND PARK DISTRICT OF PEORIA, PEORIA, ILLINOIS, as Obligee, in the amount of
(\$	
successors and assigns, jo	ntly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated \_\_\_\_\_\_, 20 \_\_\_\_\_ entered into a contract with Obligee for \_\_\_\_\_\_

in accordance with contract documents prepared by the Architect-Engineer, which Contract is by reference made a part hereof and is hereinafter referred to as "the Contract".

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Principal shall promptly and faithfully perform the Contract and all changes thereof, and during the life of any guaranty or warranty required under the Contract, and, if Principal shall fully secure and protect the Obligee from all liability and from all loss or expense of any kind, including all court costs, engineering fees and attorneys' fees made necessary or arising from the failure, refusal or neglect of Principal to comply with all obligations assumed by Principal in connection with the performance of the Contract and all changes thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Surety hereby waives notice of any changes in the Contract, including extensions of time for the performance thereof. Whenever Principal shall be and is declared to be in default under the Contract, Obligee having performed Obligee's obligations thereunder, Surety shall, after notice of such default, reserve all rights against all parties, take over and complete the Contract and become entitled to payment of the balance of any monies due or to become due to such defined Principal in accordance with the progress of the work.

A condition of this Bond is that the Principal shall faithfully perform in accordance with the prevailing wage clause provided in the bid specification or Contract pursuant to Illinois Compiled Statutes 820 ILCS 130/1 *et. seq.* 

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Obligee named herein.

Signed and Sealed this \_\_\_\_\_\_, 20 \_\_\_\_\_\_,

PEORIA ZOO TAKIN ENCLOSURE - Project Manual

# **CONTRACTOR**

# **SURETY**

Contractor Firm Name

By: \_\_\_\_\_

Signature

Title

Surety Name

By:\_\_\_\_\_ Attorney-in-Fact

Resident Agent

ATTEST:

Corporate Secretary (Corporations only)

# LABOR & MATERIAL PAYMENT BOND

#### TO: PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA PEORIA, ILLINOIS

#### KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, Principal has by written agreement dated _	, 20	, entered into a Contract
with Obligee for		

in accordance with contract documents prepared by the Architect-Engineer which Contract is by reference made a part hereof, and is hereinafter referred to as "the Contract".

**NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION** is such that if Principal shall promptly pay for all laborers, workers and mechanics engaged in the work under the Contract, and not less than the general prevailing rate of hourly wages of a similar character in the locality in which the work is performed, as determined by the State of Illinois Department of Labor pursuant to the Illinois Compiled Statutes 820 ILCS 130/1 et. seq. and for all material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect.

1. A claimant is defined as any person, firm, or corporation having contracts with the Principal or with any of Principal's subcontractors for labor or materials furnished in the performance of the Contract on account of which this Bond is given.

2. Nothing in this Bond contained shall be taken to make the Obligee liable to any subcontractor, materialman or laborer, or to any other person to any greater extent than it would have been liable prior to the enactment of The Public Construction Bond Act, approved June 20, 1931, as amended; provided further, that any person having a claim for labor and materials furnished in the performance of the Contract shall have no right of action unless he shall have filed a verified notice of such claim with the Obligee within 180 days after the date of the last item of work or the furnishing of the last item of materials, which claim shall have been verified and shall contain the name and address of the claimant, the business address of the claimant within the State of Illinois, if any, or if the claimant be a foreign corporation having no place of business within the State the principal place of business of the corporation, and in all cases of partnership the names and residences of each of the partners, the name of the Contractor for the Obligee, the name of the person, firm or corporation by whom the claimant was employed or to whom such claimant furnished materials, the amount of the claim and a brief description of the public improvement for the construction or installation of which the Contract is to be performed. No defect in the notice herein provided for shall deprive the claimant of its right of action under the terms and provisions of this Bond unless it shall affirmatively appear that such defect has prejudiced the rights of an interested party asserting the same.

3. No action shall be brought on this Bond until the expiration of 120 days after the date of the last item of work or of the furnishing of the last item of material except in cases where the final settlement between the Obligee and the Contractor shall have been made prior to the expiration of the 120 day period, in which case action may be taken immediately following such final settlement; nor shall any action of any kind be brought later than 6 months after the acceptance by the Obligee of the work. Such suit shall be brought only in the circuit court of this State in the judicial district in which the Contract is to be performed.

4. Surety hereby waives notice of any changes in the Contract, including extensions of time for the performance thereof.

5. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

6. The Principal and Surety shall be liable for any attorneys fees, engineering costs, or court costs incurred by the Obligee relative to claims made against this Bond.

Signed and Sealed this	day of	, 20
<u>CONTRACTOR</u>		<u>SURETY</u>
Contractor Firm Name:		
By:Signature		By: Attorney-in-Fact
Title		Resident Agent
ATTEST:		

Corporate Secretary (Corporations only)

# **CONTRACTOR'S AFFIDAVIT**

# STATE OF ILLINOIS ) ) SS COUNTY OF PEORIA )

## TO WHOM IT MAY CONCERN:

THE undersigned, being duly sworn, deposes and says that he is \_\_\_\_\_\_

who is the contractor for the	
building located at	
owned by	

That the total amount of the contract including extras is \$\_\_\_\_\_\_\_ on which he has received payment of \$\_\_\_\_\_\_ prior to this payment. That all waivers are true, correct and genuine and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names of all parties who have furnished material or labor, or both, for said work and all parties having contracts or sub-contracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES	WHAT FOR	CONTRACT PRICE	AMOUNT PAID	THIS PMT.	BALANCE DUE

# TOTAL ALL LABOR AND MATERIAL TO COMPLETE

There are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this	day of	. 20
Digned uno	uu y 01	. 20 .
0	/	//

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

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

Notary Public

# FINAL WAIVER OF LIEN

## STATE OF ILLINOIS ) ) SS COUNTY OF PEORIA )

## TO WHOM IT MAY CONCERN:

[Affix corporate seal here.]

(Name of sole owner, corporation or partnership)

ATTEST:

(Signature of secretary of corporation)

(Signature of sole owner or authorized representative of corporation or partnership)

(SEAL)

# WAIVER OF LIEN

# GENERAL CONTRACTOR'S PARTIAL TO COVER ONLY CERTAIN PAYMENTS

STATE OF ILLINOIS	)	
	)	SS

COUNTY OF PEORIA )

# TO ALL WHOM IT MAY CONCERN:

WHEREAS, the undersigned \_\_\_\_\_\_ has been employed

by THE PEORIA PARK DISTRICT to furnish material and labor for the \_\_\_\_\_\_at

the premises commonly known as \_\_\_\_\_

located in the City of Peoria, County of Peoria, and State of Illinois.

NOW, THEREFORE, the undersigned, for and in consideration of the sum of \_\_\_\_\_

\_\_\_\_\_\_Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged by the undersigned, does hereby waive and release to the extent only of the aforesaid amount of \_\_\_\_\_\_\_Dollars, paid simultaneously herewith, any and all lien or right or claim of lien under the statutes of the State of Illinois relating to mechanics' liens, with respect to and on said above-described premises, and the improvements thereon and on the money, funds, or other consideration due or to become due from the owner on account of labor, services, material, fixtures, apparatus or machinery, furnished by the undersigned, to or on account of the said owner, for the above-described premises, but only to the extent of the payment aforesaid.

Dated this \_\_\_\_\_, 20 \_\_\_\_\_,

[Affix corporate seal here]

(Name of sole owner, corporation or partnership)

ATTEST:

(SEAL)

(Signature of secretary of corporation)

(Signature of sole owner or authorized representative of corporation or partnership)

# SUB-CONTRACTOR'S FINAL WAIVER OF LIEN

# STATE OF ILLINOIS ) ) SS COUNTY OF PEORIA )

# TO WHOM IT MAY CONCERN:

WHEREAS, the undersigned	
	(sub-contractor)
ha been employed by	
to furnish material and labor for the	at the
premises commonly known as	, in the City of,
County of Peoria, State of Illinois.	
The undersigned, for and in consider	ation of
the receipt whereof is hereby acknowledged, the statutes of the State of Illinois relating to I the money, funds or other considerations due apparatus or machinery heretofore furnished of described premises.	do hereby waive and release any and all lien or claim or right of lien under Mechanics Liens, on the above described premises and improvements thereon and on or become due from the owner on account of labor or services, material, fixtures, or which may be furnished at any time hereafter by the undersigned for the above
Dated this day of	
[Affix corporate seal here.]	
ATTEST:	
(Name of sole owner, corporation or partners)	hip)
(Signature of sole owner or authorized representative of corporation of partnership)	(SEAL) (Signature of secretary of corporation)

# WAIVER OF LIEN

# SUB-CONTRACTOR'S PARTIAL TO COVER ONLY CERTAIN PAYMENTS

STATE OF ILLINOIS	)	
COUNTY OF PEORIA	) 55	
TO WHOM IT MAY CON	ICERN:	
THE undersigned,	,	
has been employed by	(sub-contrac	ctor)
to furnish material and labo	(general contra	actor)
at the premises commonly	known as	
located in the City of Peori	a, County of Peoria, and State of	f Illinois.
NOW, THEREFC	ORE, the undersigned, for and in	consideration of the sum of Dollars, and other good and valuable considerations, the receipt
of the aforesaid amount of simultaneously herewith, a liens, with respect to and o consideration due or to bec furnished by the undersigne	ny and all lien or right or claim of n said above-described premises ome due from the owner on accord ed, but only to the extent of the p	Dollars, paid of lien under the statutes of the State of Illinois relating to mechanics' , and the improvements thereon and on the money, funds, or other ount of labor, services, material, fixtures, apparatus or machinery, payment aforesaid.
Dated this	day of	, 20
[Affix corporate seal here.]		
		(Name of sole owner, corporation or partnership)
ATTEST:		
		(SEAL)
(Signature of secretary of c	orporation)	(Signature of sole owner or authorized representative of corporation or partnership)

# PEORIA PARK DISTRICT Weekly Workforce Report Instructions

This weekly workforce report must be completed and returned to the Peoria Park District project manager for each week that you are working on Peoria Park District property. You are to report only those employees that are actually working on the Peoria Park District project identified on this report. Do <u>not</u> report employees that are <u>not</u> working on the project identified on this report.

If you have further questions regarding this report, please contact the Owner's Project Manager.

- I. Trade and Hour Breakdown Table
  - List the different trades (carpenter, laborer, plumber, etc.) and report the number of hours by race/gender for each trade;
  - Total the hours for each trade on the right.
- II. New Hires by Race and Gender
  - If additional employees are hired for the job, please record the number of employees hired by race/gender.
- III. Total Project Employee Breakdown
  - Please track total hours by race/gender for the project if project lasts longer than a week.

# Weekly Workforce Report (Peoria Park District Form) Date:\_\_\_\_\_ Week Ending: \_\_\_\_\_

Contractor/Subcontractor:\_\_\_\_\_\_ Project: \_\_\_\_\_\_

Trade & Hour Breakdown:

TRADE	FEMALE HOURS	CAUCASIAN HOURS	AFRICAN- AMERICAN HOURS	HISPANIC HOURS	NATIVE AMERICAN HOURS	ASIAN, PAC. ISLANDER HOURS	TOTAL HOURS

# New Hires by Race & Gender

TRADE	CAUCASIAN	AFRICAN- AMERICAN	HISPANIC	NATIVE AMERICAN	ASIAN, PACIFIC ISLANDER	MALE	FEMALE

Total Project Employee Breakdown

CAUCASIAN	AFRICAN- AMERICAN	HISPANIC	NATIVE AMERICAN	ASIAN, PACIFIC ISLANDER	MALE	FEMALE

PEORIA ZOO TAKIN ENCLOSURE - Project Manual

Mode of conduction       Condu			•• •	CERTIFIED PAY	ROLL F se Own	Form)						
Note:         Consist:         Consist: <t< th=""><th>NAME OF CONTRACTOR</th><th>OR SUBCONTRACTOR</th><th>Õ</th><th>ADDRE</th><th>SS</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	NAME OF CONTRACTOR	OR SUBCONTRACTOR	Õ	ADDRE	SS							
New         No	PAYROLL NO.	FOR WEEK ENDING		PROJE	CT AND LC	CATION					PROJECT OR CO	ONTRACT NO.
Note:         Oute:         Oute: <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>CDOSS</td><td></td><td>DEDICTIONS</td><td></td><td></td><td></td></th<>							CDOSS		DEDICTIONS			
04 BADOLOGE     11     1	NAME, ADDRESS, TELEPHONE NUMBER	CLASSIFICATION			TOTAL	RATE	AMOUNT			) 	TOTAL	NET WAGES
	OF EMPLOYEE				HOURS	OF PAY	EARNED	FICA	TAX	OTHER	DEDUCTIONS	PAID FER WEEN
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(Name of Signatory Party) (Title)]		
do hereby state: /1) That I hav or supervise the payment of the persons employed by		
(1) THAT I bay or substance dis positions of the boundary emission of	REMARKS:	
(Contrador of Subcontrador)		
that during the payroll period commercing on the		
day of day of and ending the day of		
all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will		
be made either directly or indirectly to or on behalf of seid		
from the full		
(Contractor or Subcontractor)		
weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages		
earned by any person, other than permissible deductions authorized by law.	NAME AND TITLE	SIGNATURE
	THE WILLFUL FALSIFICATION OF ANY OF THE ABI	OVE STATEMENTS MAY SUBJECT THE ? CRIMINAL PROSECUTION. SEE SECTION 5
(2) That any payrolis otherwise under this contract required to be submitted for the above period are correct and complete;	(820 ILCS 130/5) OF THE PREVAILING WAGE ACT (	OF THE STATE OF ILLINOIS.
that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates mendated by the Illinois Prevailing Wage Act and that the classifications set forth therein for each laborer or mechanic conform with the work performed.		
(3) does remit/does not remit (circle correct str	atement) contributions to frii	nge benefit funds that are jointly
(Contractor or Subcontractor)		
maintained and jointly governed by one or more employers and one or more Management Relations Act (LMRA).	labor organizations in accor	rdance with the Federal Labor
(4) If does not remit contributions to a fringe be	enefit fund that is jointly ma	intained and jointly governed
(Contractor or Subcontractor)		
by one or more employers and one or more labor organizations in accordanc fund, the following information is required:	e with the LMRA, but does	remit contributions to a fringe benefit
(b) The name and address of each fringe benefit fund:		
(c) The plan sponsor of each fringe benefit fund, if applicable:		
(d) The plan administrator of each fringe benefit fund, if applicable:		

ge 2.	2 Business name/disregarded entity name, if different from above			
pe ons on pa	Check appropriate box for federal tax classification; check only one of the following seven boxes:     Individual/sole proprietor or     C Corporation S Corporation Partnership     single-member LLC	Trust/estate	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any)	
Print or ty Instruction	<ul> <li>Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnersh</li> <li>Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in t</li> <li>the tax classification of the single-member owner.</li> <li>Other (see instructions) </li> </ul>	ip) ► he line above for	Exemption from FATCA reporting code (if any) (Applies to accounts maintained outside the U.S.)	
F pecific	5 Address (number, street, and apt. or suite no.)	Requester's name a	and address (optional)	
See S	6 City, state, and ZIP code			
	7 List account number(s) here (optional)			
Par	t I Taxpayer Identification Number (TIN)			
Enter	your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoi	d Social sec	curity number	
backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other				
TIN or	n page 3.	or		
Note.	If the account is in more than one name, see the instructions for line 1 and the chart on page 4	for Employer	identification number	
guidel	ines on whose number to enter.		-	

#### Part II Certification

Under penalties of perjury, I certify that:

- 1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
- 3. I am a U.S. citizen or other U.S. person (defined below); and

4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign	Signature of
Here	U.S. person ►

# **General Instructions**

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw*9.

#### Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)

#### Date 🕨

- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- · Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

**Note.** If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

**Definition of a U.S. person.** For federal tax purposes, you are considered a U.S. person if you are:

• An individual who is a U.S. citizen or U.S. resident alien;

• A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;

• An estate (other than a foreign estate); or

• A domestic trust (as defined in Regulations section 301.7701-7).

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership to enducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

• In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;

• In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and

• In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

**Foreign person.** If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

**Example.** Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

#### **Backup Withholding**

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

#### Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt* payee code on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see Special rules for partnerships above.

#### What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

#### Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

#### Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

**Civil penalty for false information with respect to withholding.** If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

**Misuse of TINs.** If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

# **Specific Instructions**

#### Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

**Note. ITIN applicant:** Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation. Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(ii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

#### Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

#### Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

#### Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

#### Exempt payee code.

Generally, individuals (including sole proprietors) are not exempt from backup withholding.

• Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.

• Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.

 Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1 - An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2-The United States or any of its agencies or instrumentalities

3-A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

 $4-\!\mathrm{A}$  foreign government or any of its political subdivisions, agencies, or instrumentalities

5-A corporation

6-A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

 $7{-}\mathrm{A}$  futures commission merchant registered with the Commodity Futures Trading Commission

8-A real estate investment trust

 $9-\mathrm{An}$  entity registered at all times during the tax year under the Investment Company Act of 1940

10-A common trust fund operated by a bank under section 584(a)

11-A financial institution

 $12\mbox{--}A$  middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947 The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for	THEN the payment is exempt for
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over \$600 required to be reported and direct sales over \$5,000 <sup>1</sup>	Generally, exempt payees 1 through 5 <sup>2</sup>
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

<sup>1</sup> See Form 1099-MISC, Miscellaneous Income, and its instructions.

<sup>2</sup> However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

**Exemption from FATCA reporting code.** The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B-The United States or any of its agencies or instrumentalities

C-A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D-A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E-A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F-A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G-A real estate investment trust

 $\rm H-A$  regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I-A common trust fund as defined in section 584(a)

J-A bank as defined in section 581

K-A broker

L-A trust exempt from tax under section 664 or described in section 4947(a)(1)

M-A tax exempt trust under a section 403(b) plan or section 457(g) plan

**Note.** You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

#### Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

#### Line 6

Enter your city, state, and ZIP code.

#### Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

**Note.** See the chart on page 4 for further clarification of name and TIN combinations.

**How to get a TIN.** If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an TIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

**Caution:** A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

#### Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see Exempt payee code earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

#### What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
<ol> <li>Individual</li> <li>Two or more individuals (joint account)</li> </ol>	The individual The actual owner of the account or, if combined funds, the first individual on the account'
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor <sup>2</sup>
<ul> <li>4. a. The usual revocable savings trust (grantor is also trustee)</li> <li>b. So-called trust account that is not a legal or valid trust under state law</li> </ul>	The grantor-trustee' The actual owner'
5. Sole proprietorship or disregarded entity owned by an individual	The owner <sup>3</sup>
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i) (A))	The grantor*
For this type of account:	Give name and EIN of:
<ol> <li>Disregarded entity not owned by an individual</li> </ol>	The owner
8. A valid trust, estate, or pension trust	Legal entity <sup>4</sup>
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax- exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
<ol> <li>Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i) (B))</li> </ol>	The trust

List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

Circle the minor's name and furnish the minor's SSN.

<sup>3</sup> You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

<sup>4</sup> List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see Special rules for partnerships on page 2. \*Note. Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

#### Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- · Protect your SSN,
- Ensure your employer is protecting your SSN, and
- · Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

#### **Privacy Act Notice**

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

A complete copy of AIA Document A201, 1997 Edition, with Supplementary General Conditions incorporated, is available for review in the Peoria Park District's Planning, Design and Construction Office.

# SUPPLEMENTARY GENERAL CONDITIONS

- 1. A. "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION", AIA Document A201, 1997 Edition, published by the American Institute of Architects, including revisions adopted before the date of the Project Manual, is hereby made part of these Specifications with same force and effect as though set forth in full.
  - **B.** The following modifies, changes, deletes from or adds to the General Conditions of the Contract for Construction (AIA Document A201, Fourteenth Edition, 1997). Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.
  - C. Parenthesis () indicates the appropriate section and Subparagraph of the General Conditions which each paragraph of the Supplementary General Conditions modifies or refers to.
- 2. INSERT THE FOLLOWING PHRASE TO PARAGRAPH (1.1.1) AFTER THE WORDS "The Contract Documents consist of the Agreement Between Owner and Contractor (hereinafter the Agreement)":

"the Contractor's Bid, the Advertisement for Bids, the Instructions to Bidders, sample forms and addenda relating to these,"

# DELETE THE LAST SENTENCE OF PARAGRAPH (1.1.1).

# 3. ADD THE FOLLOWING SENTENCES TO END OF PARAGRAPH (<u>1.2.1</u>):

The Contractor shall notify the Owner's Representative immediately if discrepancies are discovered. Fullsize or large-scale details or drawings shall govern small-scale drawings that the former are intended to amplify. Dimensions from drawings shall not be determined by scale or rule. Where the Drawings and Specifications conflict with each other or with themselves, the Owner's Representative (in consultation with the Architect, if any) will decide which conflicting requirement governs. Should discrepancies or doubt occur, Contractor shall not proceed with the Work without clarification from the Owner. Contractor shall request clarification in a reasonable time to avoid delays and increases in the Contract Sum.

# ADD THE FOLLOWING PARAGRAPHS TO SECTION (1.2):

- **1.2.4** If any item or material shown on the Drawings is omitted from the Specifications, or vice-versa (except when the Drawings and Specifications clearly exclude such omitted item), and when such item or material is clearly required to complete the detail shown or specified, the Contractor shall furnish and install such item or material of the type and quality established by the balance of the detail shown and specified at no increase to the Contract Sum.
- **1.2.5** Where a typical or representative detail is shown on the Drawings, this detail shall constitute the standard for workmanship and materials throughout those parts of the Work.

- **1.2.6** Any Summary of Work as outlined in the Specifications shall not be deemed to limit the work required by the Contract Documents. The Contractor and each Subcontractor shall be responsible for carefully examining all Drawings, including all details, plans, elevations, sections, schedules and diagrams for each particular type of work, and for coordinating the Work described in the Drawings, with the related Specifications. The Contractor shall also be responsible for determining the exact scope of work for each type of work per the Contract Documents and Contractor shall endeavor to check cross-references of work excluded from any division. The Contract Sum is deemed to be based on a complete installation. When additional details or instructions are clearly required to complete the work, the Contractor is deemed to have made an allowance in the Contract Sum for completion of such Work consistent with the local standard of care.
- **1.2.7** The Drawings are intended to show the arrangement, design and extent of the Work and are schematic in nature. They are not to be scaled for roughing-in measurements or used as shop drawings.

# 4. ADD THE FOLLOWING PARAGRAPH TO SECTION (<u>1.5</u>):

**1.5.3** Neither any oral representation by or oral agreement with any officer, agent, or employee of Owner or Architect before execution of this Contract shall affect or modify any of the Contractor's rights or obligations hereunder. Contractor is not aware of any facts that make misleading or inaccurate in any material respect any information Owner or Architect has furnished to Contractor which would have a material adverse affect on the Contract Time or Contract Sum which Contractor has not advised Owner or Architect of, and if, during the course of the performance of the Work, Contractor learns of any such facts it will so advise Owner. Contractor shall not be entitled to any adjustments in the Contract Time or the Contract Sum as a consequence of Contractor's breach of the terms of this Subparagraph.

# 5. IN PARAGRAPH (<u>1.6.1</u>) DELETE THE WORD "Architect" IN THE FOURTH SENTENCE AND REPLACE IT WITH THE WORD "Owner".

**DELETE SENTENCES #7, #8, #9 STARTING WITH** "The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are ...."

# 6. DELETE PARAGRAPH (2.2.3) IN ITS ENTIRETY.

# 7. ADD THE FOLLOWING SENTENCE AT THE END OF PARAGRAPH (2.3.1):

"The Owner shall not be liable for any extra cost incurred by the Contractor by such an order."

# 8. IN PARAGRAPH (<u>2.4.1</u>) DELETE THE SECOND TO LAST SENTENCE.

# 9. IN PARAGRAPH (3.2.1, 3.2.2 AND 3.2.3) AFTER THE WORD "Architect" ADD THE WORDS "and Owner".

# 10. ADD THE FOLLOWING PARAGRAPHS TO SECTION (<u>3.2</u>):

**3.2.4** Before starting any work, the Contractor shall examine work performed by others to which his work adjoins or is applied to and report to the Owner's Representative any conditions that will prevent the satisfactory accomplishment of his work. Failure to notify the Owner's Representative of deficiencies or faults in preceding work prior to commencing work shall constitute acceptance thereof and waiver of any claim of its unsuitability.

# 11. ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.4):

- **3.4.4** Before ordering any material or doing any Work, the Contractor shall verify all measurements at the Project site and he shall be responsible for the correctness of same. No extra charge or compensation will be allowed to the Contractor on account of any difference between actual dimensions and the measurements shown on the Project Drawings.
- **3.4.5** The Contractor shall carefully inspect all materials delivered on and to the Project site and reject defective materials without waiting for the Owner's Representative or other representative of Owner to observe the materials.

# 12. ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.5):

- **3.5.2** The Contractor agrees to assign to the Owner any and all manufacturer's warranties relating to materials and equipment furnished as part of the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties subject to installation directives and other terms of the Contract Documents. The Contractor agrees to deliver to the Owner, upon final payment, such assignments along with or as part of a reference manual, in form and detail reasonably acceptable to Owner, showing all such warranties and guarantees provided by the Contractor and Subcontractors. Such warranties and guarantees shall commence no sooner than the date of purchase from the supplier.
- **3.5.3** The warranty of Contractor provided in Paragraph 3.5 shall in no way limit or abridge the warranties of the suppliers of equipment and systems which are to comprise a portion of the Work, if they are broader, and all of such warranties shall be in form and substance as required by the Contract Documents. Contractor shall take no action or fail to act in any way which results in the termination or expiration of such third party warranties or which otherwise results in prejudice to the rights of the Owner under such warranties subject to installation directives and other terms of the Contract Documents. Contractor agrees to provide all notices required for the effectiveness of such warranties and shall include provisions in the contracts with the providers and manufacturers of such systems and equipment whereby Owner shall have a direct right of enforcement of such warranty obligations.

# 13. IN PARAGRAPH (<u>3.6.1</u>), DELETE THE WORD "Sales".

# ADD THE FOLLOWING AT THE END OF PARAGRAPH (<u>3.6.1</u>):

The Peoria Park District is exempt from Federal, State and Local taxes. A certificate of exemption will be furnished upon request.

# 14. IN PARAGRAPH (3.10.2) BEFORE THE WORD "Architect's" ADD THE WORDS "Owner's and".

**IN PARAGRAPH** (<u>3.10.2</u>) **AFTER THE WORD** "Architect" **ADD THE WORDS** "and Owner's Representative".

# ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.10):

**3.10.4** The construction schedule shall provide for the most expeditious and practicable execution of the Work. The Contractor shall also work closely with the Owner to confirm that the construction schedule accurately reflects the status of the Project. The Contractor's construction schedule shall be updated every month by the Contractor and submitted to the Owner.

- .1 Whenever it becomes apparent from the updated construction schedule that any substantial completion previously established by the construction schedule cannot be met, the Contractor shall, at the Owner's request, take any or all of the following actions with no increase to the Contract Sum or Contract Time (unless the delay is caused by an event set forth in paragraph 8.3 of these General Conditions thereby permitting adjustment of the Contract Sum and/or Contract Time under Paragraph 4.3.5 of these General Conditions):
  - .1.1 Increase construction manpower to substantially return the Project to schedule;
  - **.1.2** Increase the number of working hours per shift, shifts per day or the amount of construction equipment or any combination of the foregoing which will substantially return the Project to schedule;
  - **.1.3** Reschedule activities to concurrently accomplish activities, to the maximum degree practicable, in the time required by the Contract Documents.

If the Contractor fails to take any of these actions Owner shall have the notice and other rights set forth in Paragraph 2.4.

# 15. IN PARAGRAPH (<u>4.1.1)</u> DELETE THE FIRST SENTENCE AND SUBSTITUTE THE FOLLOWING:

"The Architect, Owner's Representative, and Owner's Project Manager are defined in Paragraph C of "Section 01000 - General" of "Division 01000 - General Requirements".

- 16. IN PARAGRAPH (4.2.1) DELETE THE WORDS "and will be an Owner's Representative".
- 17. IN PARAGRAPH (4.2.2) DELETE THE WORDS "as a representative of the Owner".
- 18. IN PARAGRAPH (<u>4.2.4</u>) IN THE FIRST SENTENCE SUBSTITUTE THE WORD "Architect" FOR THE WORD "Owner" AND SUBSTITUTE THE WORD "Owner" FOR THE WORD "Architect".
- 19. IN PARAGRAPH (<u>4.2.5</u>) DELETE THE WORD "Architect's" AND "Architect"AND SUBSTITUTE THE WORDS "Owner Representative's" AND "Owner Representative".
- 20. IN PARAGRAPH (<u>4.2.6</u>) IN THE SECOND SENTENCE AFTER THE WORDS "will have authority" INSERT THE WORDS "upon written authorization from the Owner".
- 21. IN PARAGRAPH (<u>4.2.8</u>) DELETE THE WORD "prepare" AND SUBSTITUTE THE WORDS "assist the Owner's Representative in preparing".
- 22. IN PARAGRAPH (<u>4.2.9</u>) DELETE THE WORD "Architect" AND SUBSTITUTE WORDS "Owner's Representative, assisted by the Architect".
- 23. IN PARAGRAPH (4.2.11) IN THE FIRST SENTENCE DELETE THE WORDS "and decide".
- 24. IN PARAGRAPH (4.2.12) IN THE FIRST SENTENCE DELETE THE WORD "and decisions".

IN PARAGRAPH (<u>4.2.12</u>) IN THE SECOND SENTENCE DELETE THE WORDS "and initial decisions" AND "or decisions".

25. ADD PARAGRAPH TO SECTION (4.2):

- 4.2.14 Notwithstanding any other provision of this Agreement to the contrary, the Architect shall have no authority to order or approve any material deviation from the Contract Documents, whether or not such deviation affects the Contract Sum or other Substantial Completion Date (as defined herein). In the event any such deviation is sought, prior written approval from the Owner's Representative and the Owner must be obtained. The Architect may decide quality issues and may approve non-material deviations from the Contract Documents.
- 26. IN PARAGRAPH (<u>4.3.4</u>) IN THE FOURTH SENTENCE DELETE THE WORD "decision" AND SUBSTITUTE THE WORD "recommendation".

IN PARAGRAPH (<u>4.3.4</u>) IN THE LAST SENTENCE DELETE THE WORD "determination" AND SUBSTITUTE THE WORD "recommendation".

# 27. DELETE PARAGRAPH (<u>4.3.10</u>) IN ITS ENTIRETY.

# 28. DELETE PARAGRAPH (4.4.1) AND SUBSTITUTE THE FOLLOWING:

"Claims, disputes and other matters in question between the Contractor and the Owner relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be initially referred in writing to the Architect for a recommendation."

29. IN PARAGRAPH (<u>4.4.2</u>) AFTER "(2)" ADD THE WORD "recommend" AND CHANGE THE WORD "reject" TO "rejecting".

IN PARAGRAPH (<u>4.4.2</u>) AFTER "(3)" ADD THE WORD "recommend" AND CHANGE THE WORD "approve" TO "approving".

**IN PARAGRAPH** (<u>4.4.2</u>) **AT THE END OF THE SENTENCE DELETE THE WORD** "resolve" **AND ADD THE WORDS** "make recommendation on".

- **30.** IN PARAGRAPH (<u>4.4.3</u>) DELETE THE WORD "decision" AND SUBSTITUTE THE WORD "recommendation".
- **31.** IN PARAGRAPH (<u>4.4.4</u>) IN THE LAST SENTENCE DELETE THE WORDS "either reject or approve the Claim" AND SUBSTITUTE THE WORDS "provide a recommendation regarding the Claim in accordance with Paragraph 4.2.2".

**IN PARAGRAPH** (<u>4.4.4</u>) **AT THE END OF THE LAST SENTENCE DELETE THE WORDS** "in whole or in part."

- 32. DELETE PARAGRAPHS (<u>4.4.5</u>) AND (<u>4.4.6</u>) IN THEIR ENTIRETY.
- **33.** IN PARAGRAPH (<u>4.4.8</u>) DELETE THE WORD "resolution" AND SUBSTITUTE THE WORDS "final recommendation".

IN PARAGRAPH (4.4.8) AFTER THE WORD "Architect," ADD THE WORD "or".

IN PARAGRAPH (4.4.8) AT THE END OF THE SENTENCE DELETE THE WORDS "or by arbitration".

34. IN PARAGRAPH (<u>4.5.1</u>) DELETE THE WORD "decision" AND SUBSTITUTE THE WORD "recommendation".

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IN PARAGRAPH (4.5.1) DELETE THE WORDS "arbitration or".

**35.** IN PARAGRAPH (<u>4.5.2</u>) IN THE SECOND SENTENCE DELETE THE WORDS "a demand for arbitration" AND SUBSTITUTE THE WORDS "legal or equitable proceedings".

**IN PARAGRAPH** (<u>4.5.2</u>) **AFTER THE WORDS** "proceed in advance of " **DELETE THE WORDS** "arbitration or".

- 36. IN PARAGRAPH (<u>4.5.3</u>) DELETE THE FIRST SENTENCE.
- **37.** DELETE SECTION (<u>4.6</u>) IN ITS ENTIRETY.

# 38. IN PARAGRAPH (5.2.1) DELETE THE FIRST SENTENCE AND SUBSTITUTE:

"The subcontractors/suppliers listed by the Contractor on the Major Subcontractor/Supplier List (submitted with the Bid) shall not be changed without the written consent of the Owner."

**IN PARAGRAPH** (5.2.1) **IN THE SECOND SENTENCE DELETE THE WORDS** "Architect will" **AND SUBSTITUTE THE WORDS** "Owner's Representative will".

**IN PARAGRAPH** (5.2.1) **IN THE SECOND SENTENCE AFTER THE WORDS** "promptly reply to" **ADD THE WORDS** "any request made by".

**IN PARAGRAPH** (5.2.1) **IN THE SECOND SENTENCE AFTER THE WORDS** "any such proposed" **ADD THE WORDS** "change in".

IN PARAGRAPH (5.2.1) IN THE LAST SENTENCE DELETE THE WORDS "Owner or Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".

**IN PARAGRAPH** (5.2.1) **IN THE LAST SENTENCE DELETE THE WORD** "promptly" **AND ADD THE WORDS** "within 10 calendar days (of receipt of written request for such change from the Contractor)".

- 39. IN PARAGRAPH (6.2.2) BEFORE THE WORD "Architect" ADD THE WORDS "Owner and".
- 40. IN PARAGRAPH (6.3.1) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORD "Owner".
- **41.** IN PARAGRAPH (<u>7.2.1</u>) DELETE THE WORDS "the Architect" AND SUBSTITUTE THE WORDS "the Owner's Representative".

# ADD THE FOLLOWING PARAGRAPHS TO SECTION (7.2):

- 7.2.3 A Change Order shall include all of the Contractor's costs associated therewith.
- **7.2.4** The Contractor shall not accept any request for a Change Order from any person other than the Owner and may not perform any work asserted to constitute a change in the Work until the Owner has approved the Change Order in writing, unless the Owner authorizes the Contractor, in writing, to proceed with a change prior to the Owner's final approval. Notwithstanding anything to the contrary herein, the Contractor shall not charge for overtime services in the performance of any Change Order Work, unless the Owner has specifically authorized overtime in writing. Owner may competitively bid changes in the Work and Contractor, Subcontractor and suppliers shall provide Owner with all documents Owner requests to facilitate such competitive bidding of changes in the Work.

- **7.2.5** There shall be no change in the Work, whether an alteration or addition to the Contract Sum or to any amounts due under the Contract Documents or to a change in the Contract Time, unless and until such alteration or addition has been authorized by a written Change Order executed and issued in accordance and compliance with the requirements with this Article 7 or by written authorization to proceed with such change in the Work signed by the Owner or as otherwise provided pursuant to the Contract Documents. The requirements set forth in this Paragraph 7.2.5 are of the essence. No claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not any such unjust enrichment to the Work or to the Owner in fact exists, shall form the basis of any claim for an increase in any amount due under the Contract Documents or a change in the Contract Time, and the terms of a fully-executed Change Order shall be conclusive.
- 42. IN PARAGRAPH (7.3.1) DELETE THE WORDS "the Architect" AND SUBSTITUTE THE WORDS "the Owner's Representative".
- **43.** IN PARAGRAPH (<u>7.3.4</u>) DELETE THE WORDS "the Architect" AND SUBSTITUTE THE WORDS "the Owner's Representative".
- 44. IN PARAGRAPH (<u>7.3.6</u>) IN THE FIRST SENTENCE DELETE THE WORD "determined" AND SUBSTITUTE THE WORD "recommended".
- **45.** IN PARAGRAPH (<u>7.3.7</u>) IN THE FIRST SENTENCE AFTER THE WORD "Architect" ADD THE WORDS "and the Owner's Representative".
- 46. IN PARAGRAPH (7.3.8) DELETE THE WORDS "the Architect" AND SUBSTITUTE THE WORDS "the Owner's Representative".
- **47.** IN PARAGRAPH (<u>7.3.9</u>) DELETE THE WORD "determination" AND SUBSTITUTE THE WORD "recommendation".
- **48.** IN PARAGRAPH (<u>8.1.3</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".

# 49. ADD THE FOLLOWING PARAGRAPHS TO SECTION (8.2).

- **8.2.4** All work shall be "Substantially Complete" as required by the **Instructions to Bidders** and the **Agreement Between Owner and Contractor.**
- **8.2.5** It is further agreed that said completion schedule is reasonable, and the Contractor shall prosecute said work regularly, diligently and continuously at such rate of progress as will insure full completion thereof within the time specified.
- **8.2.6** Provided, however, the following exceptions:
  - .1 Any preference, priority or allocation order duly issued by the United States Government.
  - .2 Any unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including acts of God, or of a public enemy, acts of the Owner, acts of another Contractor in performance of a separate contract with the Owner, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather. The criteria on which the unusually severe weather shall be based is the average precipitation/temperatures

received in the project area, as recorded over a period of the last five (5) years at the local area United States Weather Station. Any extension of time due to unusually severe weather must be requested by the Contractor on the basis of documented records of the actual precipitation/temperatures during the contract time period, compared with the normal/average for the area. Also, the criteria shall include the number of excessive precipitation or extreme cold days (i.e., days in which the temperature would adversely affect the type of work being constructed) over the same period and whether or not the Contractor's force worked on said days or stage of construction was affected.

- .3 Any delays of subcontractors occasioned by any of the causes specified in this paragraph.
- **8.2.7** Provided further that the Contractor shall, within seven (7) days from the beginning of any such delay during the performance of the Contract, notify the Owner's Representative in writing of the alleged cause of such delay.

# 50. IN PARAGRAPH (8.3.1) DELETE THE WORDS "and arbitration".

IN PARAGRAPH (8.3.1) DELETE THE WORD "determine" AND SUBSTITUTE THE WORD "recommend".

# 51. DELETE PARAGRAPH (9.2.1) AND SUBSTITUTE THE FOLLOWING:

"Before the first Application for Payment, the Contractor shall submit to the Owner's Representative a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect and Owner's Representative may require. This schedule, unless objected to by the Architect and Owner's Representative, shall be used as a basis for reviewing the Contractor's Applications for Payment."

# 52. IN THE FIRST SENTENCE OF (9.3.1), CHANGE "ten" TO "forty five".

# IN PARAGRAPH (<u>9.3.1)</u> IN THE FIRST SENTENCE DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".

# ADD THE FOLLOWING TO THE END OF PARAGRAPH (9.3.1):

Payment requests shall consist of AIA Documents #702 "Application and Certificate for Payment"; AIA #703 "Continuation Sheet"; Contractors Affidavit of Payment to Subcontractors and Suppliers; Weekly Workforce Reports; Certified Payroll Form; and Waivers of Lien. (Waivers of Lien are required from the general contractor in the full amount of the current payment application, and from all subcontractors, suppliers, or workers who provide more than \$10,000 of project material/labor of the Work. The waiver shall be in the amount(s) listed in the Contractor's Affidavit.) For final payment, the general contractor shall also provide a Waiver of Lien in the full amount of the contract price.

The Waiver of Lien and Contractor Affidavit forms used shall be the Peoria Park District's standard form(s): 1) "Final Waiver of Lien" (for general contractors), 2) "Waiver of Lien - General Contractor's Partial To Cover Only Certain Payments", 3) "Sub-Contractor's Final Waiver of Lien", 4) "Waiver of Lien - Sub-Contractor's Partial To Cover Only Certain Payments, and 5) "Contractor's Affidavit". (These forms are included in the Project Manual, and are the required Waiver of Lien forms for the project.)

(If the Contractor is unable to provide the required sub-contractor waiver at the time the application for payment is submitted (preferred method) alternatively, it may be provided at the time that payment is delivered by the District. If the sub-contractor waiver(s) still cannot be provided at that time, the District will provide "two-party" checks in which the Contractor and the sub-contractor are named jointly as payees.)

Format of AIA #703 shall follow that of "Schedule of Values". (See Division 01000 Article IV.) All payment requests shall reflect retainage in the amount of 10% of completed work.

**53. IN PARAGRAPH** (<u>9.3.1.1</u>) **DELETE THE WORDS** "or by interim determination of the Architect, but not yet included in Change Orders".

# 54. ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (9.3.1):

- **9.3.1.3** Upon Substantial Completion, the Owner will pay 95% percent of the amount due to the Contractor on account.
- **9.3.1.4** Monthly progress payments will be made by the Owner on projects lasting more than sixty days (from award of the bid to the Substantial Completion date given in the Supplementary Instructions to Bidders).

# 55. ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (<u>9.3.2</u>):

- **9.3.2.1** Material stored on site will be considered for payment only when a Schedule of Stored Materials with appropriate values accompany the payment request as an attachment.
- **9.3.2.2** All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of material and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the contract.
- 56. IN PARAGRAPH (9.4.1) DELETE THE WORDS "Architect" AND "Architect's" AND SUBSTITUTE THE WORDS "Owner's Representative" AND "Owner's Representative's".

IN PARAGRAPH (9.4.1) DELETE THE PHRASE "with a copy to the Contractor".

57. IN THE FIRST SENTENCE OF PARAGRAPH (<u>9.4.2</u>) DELETE THE WORD "Architect".

**IN THE FIRST SENTENCE OF PARAGRAPH** (<u>9.4.2</u>) **AFTER THE WORDS** "Architect's" **ADD THE WORDS** "and Owner's Representative's".

**IN THE FOURTH SENTENCE OF PARAGRAPH** (<u>9.4.2</u>) **DELETE THE WORDS** "Architect has" **AND SUBSTITUTE THE WORDS** "Owner's Representative and Architect have".

- 58. IN PARAGRAPH (<u>9.5.1</u>) DELETE THE WORDS "Architect" AND "Architect's" AND SUBSTITUTE THE WORDS "Owner's Representative AND "Owner's Representative's".
- 59. IN PARAGRAPHS (9.6.1, 9.6.3, AND 9.6.4) DELETE THE WORDS "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".

**60.** IN PARAGRAPH (<u>9.7.1</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".

IN PARAGRAPH (9.7.1) DELETE THE WORDS "or awarded by arbitration".

- 61. IN PARAGRAPH (<u>9.8.2</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- 62. IN THE FIRST SENTENCE OF PARAGRAPH (<u>9.8.3</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative assisted by the Architect".

IN THE SECOND AND THIRD SENTENCES OF PARAGRAPH (<u>9.8.3</u>) DELETE THE WORDS "Architect's" and "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative's" and "Owner's Representative".

- 63. IN PARAGRAPH (<u>9.8.4</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- 64. IN PARAGRAPH (9.9.1) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- 65. IN PARAGRAPH (<u>9.10.1</u>) IN THE FIRST SENTENCE AFTER THE FIRST TWO APPEARANCES OF THE WORD 'Architect' ADD THE WORDS "and Owner's Representative".

IN PARAGRAPH (<u>9.10.1</u>) DELETE THE THIRD AND FOURTH APPEARANCES OF THE WORD "Architect" and "Architect's" AND SUBSTITUTE THE WORDS "Owner's Representative's".

**IN PARAGRAPH** (<u>9.10.1</u>) **AFTER THE FIFTH APPEARANCE OF THE WORD** "Architect's" **ADD THE WORDS** "and Owner's Representative's".

IN THE LAST SENTENCE OF PARAGRAPH (<u>9.10.1</u>) DELETE THE WORD "Architect's" AND SUBSTITUTE THE WORDS "Owner's Representative's".

- 66. IN PARAGRAPH (<u>9.10.2</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORD "Owner's Representative".
- 67. ADD THE FOLLOWING SUB-PARAGRAPH TO PARAGRAPH (<u>9.10.2</u>):
  - **9.10.2.1** When all items including items noted within Division 1000 General Requirements are found to be complete and in conformance with the Contract Documents, a final payment will be issued.
- 68. IN PARAGRAPH (<u>9.10.3</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- **69.** IN PARAGRAPH (<u>11.1.1</u>) IN THE FIRST SENTENCE AFTER THE PHRASE "as will protect the Contractor" ADD THE WORDS "Architect and Owner".

# **70.** IN PARAGRAPH (<u>11.1.2</u>), IN THE FIRST SENTENCE DELETE THE WORDS "limits of liability specified in the Contract Documents" AND SUBSTITUTE THE WORDS "limits required in 'Attachment A – Project Specific Insurance Requirements' (which is included as the last section of the Project Manual and the requirements therein shall be made part of the Contract Documents),".

# IN PARAGRAPH (11.1.2) AFTER THE FIRST SENTENCE ADD:

"In addition, if any of the work occurs within fifty feet of an active railroad line and the Contractor's general liability coverages provide for exclusions of coverage when working on or near a railroad, the Contractor shall provide a separate Railroad Protective Liability Insurance Policy naming the railroad as the insured party, with the coverage limits required by that railroad."

71. IN PARAGRAPH (<u>11.1.3</u>), AFTER THE WORDS "Certificates of insurance" ADD THE WORDS "and endorsements to the insurance policy(s) which are".

**IN PARAGRAPH** (<u>11.1.3</u>) **AFTER THE WORDS** "acceptable to the Owner" **ADD THE WORDS** "and naming the Owner, their agents and consultants as additional insured".

# ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (11.1)

- **11.1.4** The Contractor may, at his option, furnish Owner's Protective Liability Insurance in lieu of naming the Owner Additional Insured on the Contractor's policy, as required above. This insurance shall protect the Owner from claims as set forth in Paragraph 11.1.1 of the General Conditions, and to the limits required herein, as shown in "Attachment A".
- **11.1.5** The Contractor shall furnish two copies of each of the required Certificates or Endorsements for each copy of the Agreement which shall specifically set forth evidence of all coverage required by the Contract Documents. The form of the Certificate(s) or Endorsement(s) shall be those as required in "Attachment A". The Contractor shall also furnish to the Owner copies of any endorsements which limit coverage, or are subsequently issued amending coverage or limits of coverage.

# 72. DELETE PARAGRAPHS (<u>11.3.1, 11.3.2, AND 11.3.3)</u> IN THEIR ENTIRETY.

# 73. DELETE PARAGRAPH (<u>11.4.1)</u> AND SUBSTITUTE:

"If the work of the project is being completed by one general or prime contractor rather than multiple prime contractors, the Contractor shall purchase and maintain property insurance upon the entire Work at the site to the full replacement value thereof. Such insurance shall be in a company or companies against which the Owner has no reasonable objection. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work.

# 74. AT THE END OF PARAGRAPH (<u>11.4.1.1)</u> ADD THE FOLLOWING SENTENCE: "The form of policy for this coverage shall be "Completed Value".

# 75. DELETE PARAGRAPH (<u>11.4.1.2)</u> IN ITS ENTIRETY.

# 76. DELETE PARAGRAPH (11.4.1.3) IN ITS ENTIRETY AND SUBSTITUTE:

"If by the terms of this insurance any mandatory deductibles are required, or if the Contractor should elect, with the concurrence of the Owner, to increase the mandatory deductible amounts or purchase this insurance with voluntary deductible amounts, the Contractor shall be responsible for payment of the amount of all deductibles in the event of a paid claim. If separate contractors are added as insureds to be covered by this policy, the separate contractors shall be responsible for payment of any deductibles in the event of any the responsible for payment of appropriate part of any deductibles in the event of the responsible for payment of appropriate part of any deductibles in the event claims are paid on their part of the Project."

# 77. DELETE PARAGRAPHS (<u>11.4.3, 11.4.4, AND 11.4.5)</u> IN THEIR ENTIRETY.

# 78. DELETE PARAGRAPH (<u>11.4.6)</u> AND SUBSTITUTE:

"The Contractor shall file two certified copies of all policies with the Owner before exposure to loss can occur. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto.

# 79. DELETE PARAGRAPHS (<u>11.4.7, 11.4.8, 11.4.9, AND <u>11.4.10</u>) IN THEIR ENTIRETY.</u>

# 80. DELETE PARAGRAPH (<u>11.5.1)</u> AND SUBSTITUTE:

"The Contractor shall furnish a Performance Bond and a separate Labor and Material Payment Bond, each for one hundred percent (100%) of the Contract Sum. Form of these bonds shall be as provided by the Owner in the Project Manual and no other form will be accepted. The Surety shall be authorized to do business in the State of Illinois and be acceptable to the Owner.

- 81. IN PARAGRAPH (<u>12.1.1</u>) DELETE THE WORD "Architect's" AND SUBSTITUTE WORDS "Owner's Representative's and Architect's". DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- 82. IN PARAGRAPH (<u>12.1.2</u>) AFTER THE WORD "Architect" ADD THE WORDS "and Owner's Representative".
- **83.** IN PARAGRAPH (<u>12.2.1.1</u>) AFTER THE WORD "Architect" ADD THE WORDS "and Owner's Representative".
- 84. IN PARAGRAPH (<u>13.5.4</u>) AFTER THE WORD "Architect" ADD THE WORDS "and Owner's Representative".
- 85. IN PARAGRAPH (<u>14.1.1.3</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
- **86.** IN PARAGRAPH (<u>14.2.2</u>) DELETE THE PHRASE ", upon certification by the Architect that sufficient cause exists to justify such action,".
- 87. IN PARAGRAPH (<u>14.2.4</u>) DELETE THE WORD "Architect" AND SUBSTITUTE THE WORDS "Owner's Representative".
## 88. DELETE PARAGRAPH (<u>14.4.3)</u> IN ITS ENTIRETY AND SUBSTITUTE:

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination. In no event, however, will such amounts exceed the Contract Sum reduced by the amount of prior payments except for increases pursuant to the claims procedure in the Contract Documents. Subcontracts, subsubcontracts, and purchase orders will contain appropriate provisions for termination for convenience under this Paragraph 14.4.

# 89. ADD THE FOLLOWING ARTICLE 15: LABOR, SAFETY AND WAGE STANDARDS TO THE GENERAL CONDITIONS OF THE CONTRACT:

## ARTICLE 15 LABOR, WAGE, SAFETY, AND OTHER STANDARDS

**15.1 LABOR STANDARDS**. All employers shall comply with the Employment of Illinois Workers on Public Works Act [30 ILCS 570/1 to 570/7].

## 15.2 WAGE STANDARDS.

- **15.2.1** PREVAILING WAGE ACT: Wages and benefits to employees shall comply with all Federal and State of Illinois statutes pertaining to public works projects and specifically: Wages of Employees on Public Works [820 ILCS 130/1 12].
- **15.2.2** Not less than the prevailing rate of wages as determined by the Park District or the Department of Labor shall be paid to all laborers, workers and mechanics performing work under this contract. All contractor's bonds shall include a provision as will guarantee the faithful performance of such prevailing wage clause as provided by this bid specification or contract.
- **15.2.3** The terms "general prevailing rate of hourly wages", "general prevailing rate of wages" or "prevailing rate of wages" when used in this Act mean the hourly cash wages plus fringe benefits for training and apprenticeship programs approved by the U.S. Department of Labor, Bureau of Apprenticeship and Training, health and welfare, insurance, vacations and pensions paid generally, in the locality in which the work is being performed, to employees engaged in work of a similar character on public works.

### **15.2.4** PREVAILING WAGE ACT/FOIA

Contractors and subcontractors shall submit certified payroll on a monthly basis to the Park District in compliance with requirements of 820 ILCS 130/5. These records will be kept by the Park District for three years and may be reviewed by others through the Freedom of Information Act (FOIA). The Park District will exclude employee's address, telephone number, and social security number from public inspection.

## 15.3 SAFETY STANDARDS.

- **15.3.1** PROTECTION OF PERSONS AND PROPERTY: The Contractor and his subcontractors shall, at all times, comply with applicable provisions of Federal, State and Local laws.
  - **15.3.1.1** The Contractor and his sub-contractors shall have written programs complying with Occupational Safety and Health Administration standards and/or Illinois Department of Labor requirements including, but not limited to the following: hazardous

communications, hearing conservation, respirator use, confined space entry, scaffolding, ladders, ventilation, flammable and combustible liquids, and lockout/tagout. The Contractor shall submit documentation of their programs at the request of the Owner's Representative, or Occupational Safety and Health Administration and/or Illinois Department of Labor officials.

## 15.4 EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION/SEXUAL HARASSMENT

- **15.4.1** During the performance of the contract, the contractor agrees to the following:
  - **15.4.1.1** That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are under-utilized and will take appropriate affirmative action to rectify any such under-utilization.
  - **15.4.1.2** That, if it hires additional employees in order to perform his contract or any portion thereof, it will determine the availability (in accordance with the Rules and Regulations of the Illinois Department of Human Rights) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not under-utilized.
  - **15.4.1.3** That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability or an unfavorable discharge from military service.
  - **15.4.1.4** That it will have a written sexual harassment policy to include at the minimum, the following:
    - **15.4.1.4.1** a definition of sexual harassment under the law;
    - **15.4.1.4.2** a description of sexual harassment utilizing examples;
    - **15.4.1.4.3** a formalized complaint procedure;
    - **15.4.1.4.4** a statement of victim's rights;
    - **15.4.1.4.5** directions on how to contact the Illinois Department of Human Rights. Outof-state companies must provide directions for filing with the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency; and
    - **15.4.1.4.6** A recitation that there cannot be any retaliation against employees who elect to file charges.

- **15.4.1.4.7** In addition, it is recommended that the employer post a copy of the sexual harassment policy in a prominent and accessible location and distribute it in a manner to assure notice to all employees on an annual basis.
- **15.4.1.4.8** The Illinois Human Rights Act specifically provides that all documents may meet, but cannot exceed, the sixth grade literacy level. Therefore, the employers sexual harassment policy must be stated in plain language and in "laymen's terms".
- **15.4.1.5** That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the contractor in its efforts to comply with such Act and Rules and Regulations, the contractor will promptly so notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.
- **15.4.1.6.** That it will submit reports as required by the Department's Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.
- **15.4.1.7.** That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.
- **15.4.1.8.** That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as with other provisions of this contract, the contractor will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.
- **15.4.2** In the event of the contractor's non-compliance with the provisions of the Illinois Human Rights Act, the contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporation, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulations.

## END OF SUPPLEMENTARY GENERAL CONDITIONS

## DIVISION 010000 GENERAL REQUIREMENTS

#### SECTION 010000 - GENERAL

#### A. SUMMARY OF THE WORK

- The Work covered under this Contract consists of that work described by the Invitation to Bid, the Instructions/Supplemental Instructions to Bidders, the Bid/Proposal Form, the General/Supplemental Conditions of the Contract, these General Requirements, the Plans, and the Technical Specifications.
- The Contractor shall be responsible for all items incidental to the scope of the Work intended by the bidding documents as per A.1 above, including but not limited to, expenses incurred by the requirements of various Sections of Division 010000, unless specifically stated otherwise herein.
- 3. Changes to the Work as required by approved Change Orders shall be at the expense of the Owner, however, requests for additional payments made after the fact will not be considered.

#### B. OCCUPANCY BY OWNER.

1. The Owner reserves the right to occupy any portion of the project before it has been entirely completed, with the understanding that such occupancy shall in no way constitute acceptance of the work, in whole or in part, or of any work performed under the Contract, provided that such occupancy does not substantially interfere with completion of the work by the Contractor.

#### SECTION 012300 - ALTERNATES

Α.

Α.

- Alternates to the Bid are set forth in the Supplementary Instructions to Bidders and are listed in the Bid Form.
  - 1. Accepted Alternates have been incorporated into the Agreement.
- B. Bid Alternate pricing, as set forth in the Supplementary Instructions to Bidders and the Bid Form, shall be good for a minimum of 90 calendar days after the date of the Bid opening, and the Owner reserves the right to accept Alternates up to that time.

#### SECTION 012600 - CHANGE ORDERS

- OWNER'S REPRESENTATIVE'S FIELD ORDERS
  - 1. From time to time during progress of the Work the Owner's Representative may issue an "Owner's Representative's Field Order" which interprets the Contract Documents or orders minor changes in the Work without change in Contract Sum or Contract Time.
  - 2. Should the Contractor consider that a change in Contract Sum or Contract Time is required he shall submit an itemized proposal to the Owner's Representative <u>immediately and before proceeding with the Work</u>. If the proposal is found to be satisfactory and in proper order, the Field Order will be superseded by a Change Order.

#### B. PROPOSAL REQUESTS

From time to time during the progress of work the Owner's Representative may issue a "Proposal Request" for an itemized quotation for changes to the Work which may result in a change to the Contract Sum or Contract Time. This document **is not a Change Order** and is not a direction to proceed with the changes described therein.

#### C. CHANGE ORDERS

1.

- Change Orders are written documents describing changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof. Change Orders must be signed by both the Owner and the Architect/Owner's Representative <u>prior</u> to proceeding with the Work subject to the Change Order. **REQUESTS FOR "EXTRA'S" OR OTHER ADDITIONAL PAYMENTS OVER AND ABOVE THE CURRENT CONTRACT SUM WILL NOT BE CONSIDERED WITHOUT THE PRIOR, WRITTEN APPROVAL OF BOTH THE OWNER AND THE OWNER'S REPRESENTATIVE.** 
  - a) INITIATION. Change Orders may be initiated by a "Field Order" or "Proposal Request" per paragraphs "A" and "B" above. In addition, either the Contractor or Owner (or Owner's Representative) may initiate a Change Order through:
    - 1) Discovery of a discrepancy in the Contract Documents,
    - 2) Discovery of concealed conditions or,
    - 3) Discovery, during the course of the Work, of methods of accomplishing the Work in a better or more economical manner.
  - b) PROCESSING CHANGE ORDERS.
    - 1) Change Orders will be dated and will be numbered in sequence.
    - 2) The Change Order will describe the change or changes, or will refer to the Proposal Requests or Field Orders involved.
    - 3) The Owner's Representative will issue three copies of each Change Order to the Contractor.
    - 4) The Contractor promptly shall sign all three copies and return them to the Owner's Representative.
    - 5) The Owner and Owner's Representative will retain two signed copies in their files, and will forward one signed copy to the Contractor.
    - 6) Should the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
      - i) The Contractor promptly shall return all three of the Change Orders, unsigned by him, to the Owner's Representative with a letter signed by the Contractor stating the reason or reasons for the Contractor's disagreement.
      - The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under pertinent provisions of the Contract Documents.

#### SECTION 012900 - PAYMENT PROCEDURES

A. SCHEDULE OF VALUES

- 1. Prior to the start of construction, submit a proposed Schedule of Values to the Owner's Representative which shows a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
  - a) The Schedule of Values is required to be compatible (in the same format) with the Application for Payment "Continuation Sheet", AIA G703.
- 2. If not requested to submit additional data or to modify the submitted Schedule of Values within ten (10) days of submittal, the initially submitted Schedule shall be deemed approved.

## B. APPLICATIONS FOR PAYMENT

- 1. Progress payments will be made only if specifically called for in the Agreement. In all other cases, the Contractor may submit an Application for Payment (3 copies) upon Substantial Completion (95% of the Contract Sum), with the balance of the Contract Sum to be paid at Final Completion.
  - a) Paragraph #52 of the Supplementary General Conditions defines the documentation required for each payment request.
  - b) Applications for payment shall be delivered to the Owner's Project Manager at:

Department of Planning, Design, and Construction Peoria Park District Bradley Park Equipment Service 1314 N. Park Road Peoria, Illinois 61604

#### SECTION 013100 - PROJECT MEETINGS

A. PRECONSTRUCTION CONFERENCE

- 1. Conduct a preconstruction conference prior to the start of the Work, at the location of the Work. Provide attendance by the designated personnel of the Contractor, including Sub-contractor's and/or suppliers of major components of the Work, if requested by the Owner's Representative.
  - a) 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.
    - 16) Working hours.
    - 17) Permits and Permitting Agency Requirements

#### B. PROJECT MEETINGS

- 1. Project Meetings will be held per the schedule determined at the Preconstruction Conference, or as needed for proper coordination and administration of the project.
  - a) AGENDA
    - 1) Review and correct or approve minutes of the previous progress meeting.
    - 2) Review progress of the Work since last meeting, including status of submittals for approval.
    - 3) Identify problems which impede planned progress.
    - 4) Develop corrective measures and procedures to regain planned schedule.
    - 5) Complete other current business.

#### C. REPORTING 1. Distri

1.

Distribute copies of the minutes of each meeting to each party present, and to other parties who should have been present, no later than three business days after each meeting.

#### SECTION 013300 - SUBMITTALS

- A. Requirements for shop drawings, samples, mock-ups, product data, etc., relative to specific elements or components of the work are called out in the various sections of the Technical Specifications.
  - 1. Submit items to allow for Owner's Representative's review and approval, potential re-submission if full approval is not given, ordering, delivery, fabrication time, etc., so as to allow the Work to proceed in a timely manner and in conformance with the project schedule.

#### B. OTHER CONTRACTOR SUBMITTALS

- Unless otherwise modified the Contractor shall also submit:
  - a) A "bar chart" type proposed construction schedule, within ten days after award of the Bid.
  - b) Other submittals as required by other section of Division 010000.
- C. Submission of the required Bonds and Certificate of Insurance are to be made prior to the Owner's issuance of a Notice to Proceed.

#### SECTION 014000 - QUALITY/REGULATORY REQUIREMENTS

A. GENERAL: Contractors shall comply with all laws, rules and regulations governing the work.

- 1. When Contractor observes that contract documents are at variance with specified codes, notify Owner's Representative in writing immediately.
  - Owner's Representative will issue all changes in accord with General Conditions.
- 2. When Contractor performs any work knowing or having reason to know that the work is contrary to such laws, rules and regulations and fails to so notify the Owner's Representative, Contractor shall pay all costs arising therefrom. However, it will not be the Contractor's primary responsibility to make certain that the contract documents are in accord with such laws, rules and regulations.

#### B. SAFETY:

- 1. Comply with all federal, state, and local laws, rules and regulations governing the installation/construction of the work.
- 2. Develop and utilize safety program and training for workmen and sub-contractor employees.

#### C. TESTING 1. TH

- TESTS AND INSPECTIONS REQUIRED
  - a) Provide all tests and inspections required by governmental agencies having jurisdiction, as required by provisions of the Contract Documents and/or as specifically required by sections of the Technical Specifications.
- 2. PAYMENT FOR TESTING

a)

- Include within the Contract Sum an amount sufficient to cover all testing, re-testing, and inspections required by the Contract documents and/or the Technical Specifications. Additionally pay for all testing and inspections required by all governmental agencies having jurisdiction.
  - 1) The Owner will pay for any testing and inspecting specifically requested by the Owner's Representative which are over and above those described in Paragraph 1.a) above.
  - 2) When initial tests (over and above those defined by 1.a) above) requested by the Owner's Representative indicate non-compliance with the Contract Documents, costs of initial tests associated with that non-compliance will be deducted by the Owner from the Contract Sum, and subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.
- 3. WAIVER OF INSPECTION AND/OR TESTS
  - a) Specified inspections and/or tests may be waived only by the specific written approval of the Owner's Representative, and <u>such waivers</u> will be expected to result in credit to the Owner equal to normal cost of such inspection and/or test.

#### SECTION 014200 - REFERENCE STANDARDS AND DEFINITIONS

- A. 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.
- B. 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.
- C. Definitions: Architect, Owner's Representative, and Owner's Project Manager
  - 1. <u>ARCHITECT:</u> The Architect shall be the person or entity designated by the Owner as the Owner's Representative and shall be identified as such in the Agreement Between Owner and Contractor, and is referred to throughout the Contract Documents as if singular in number and masculine in gender.
  - 2. <u>OWNER'S REPRESENTATIVE</u>: The duties of the Owner's Representative as listed in the Project Manual, include but are not limited to, construction phase observation and technical administration services.
    - a) LIMITS OF AUTHORITY: The Owner's Representative shall be authorized to provide approvals and interpretations concerning the plans, specifications and progress of the Work as bid, but is not authorized to change the scope of the Work on behalf of the Owner.
  - 3. <u>OWNER'S PROJECT MANAGER</u>: The Owner's Project Manager will represent, act on behalf of, and provide interface between the Owner and the Contractor in respect to contract administration and/or other matters which affect the scope of the Work.
    - a) Unless defined otherwise in the Project Manual, the Owner's Project Manager shall be a designated member of the Planning, Design, and Construction Division of the Peoria Park District.
    - b) The Owner's Project Manager will also be the Owner's Representative and will provide construction phase observation and technical administration services, if a consultant Architect has not been engaged to do so, by the Owner.

#### SECTION 015000 - TEMPORARY FACILITIES & CONTROLS

#### A. MOBILIZATION

1.

- 1. Furnish all labor, tools, materials, equipment, and incidentals necessary for preparatory work.
- 2. Provide and establish personnel, equipment, supplies, materials, offices or buildings, and other facilities necessary to work on the project.
- 3. Demobilize all of the above and remove temporary facilities at the completion of the project.

#### B. BARRIERS, PROTECTION OF SITE AND PROPERTY

- GENERAL
  - a) Owner's improvements to remain, existing utilities, as well as adjacent site improvements shall be protected from damage by barriers, guards and coverings. Damaged work shall be replaced or repaired to condition prevailing at time of signing of contract, at no additional cost to Owner.

- b) <u>Provide 6' high, continuous chain link or orange plastic (used materials acceptable) construction fence to prohibit unauthorized personnel</u> or public entry from the site of the Work. (Substitutions may be considered; submit request in writing to the Owner's Representative.)
- c) Contractor shall provide, erect and maintain additional planking, fences, protective canopies, railings, shoring, lights, warning signs, etc., as needed for the protection of adjacent property and the public.
- 2. LANDSCAPE PROTECTION
  - a) All live, healthy trees, shrubs, etc. on the site or on the street fronts of the site, not specified to be removed and not interfering with installation of new work required hereunder, shall be protected against injury from construction operations.
  - b) All shade trees which are to remain and which are liable to damage during the building operations, shall be properly boxed and protected from damage during the course of construction work as directed by the Park District. No site-related work shall occur until the required tree protection (fencing, boxing, etc.) has been installed and approved by the Owner or his representative.
    - LIQUIDATED DAMAGES: The Owner reserves the right to charge the Contractor for damage to existing trees, and to deduct the charges from the amounts due the Contractor, based on the following schedule:
      - aa) Broken limbs 1" or over in diameter:
      - b) Division inner of the information definition of the division of the din divisi
      - cc) Damage to tree trunks, including "barking", nicking, gouging, etc. injury

\$100 per tree/per foot within dripline, or within 20' minimum if applicable

\$50 per caliper inch of limb

\$150 per caliper inch of tree, per each

- 3. BARRIERS/CONSTRUCTION FENCE MATERIALS
  - a) 2" open mesh chain link fence, 72" high minimum, galvanized, with appropriately sized posts; gates where indicated.
  - b) Alternate barrier fencing materials may be acceptable, however, no additional payments will be made on account of approval of alternate barrier/safety fencing materials.
  - c) Materials may be new or used, if in serviceable condition.
  - WATCHMAN SERVICE

4

5.

- a) The Owner will not be responsible for loss due to theft or other damage which is not covered under Property Insurance. The Contractor shall make such arrangements for watchman service as he considers necessary and he shall be responsible for all loss or damage of his property, equipment, material, etc., at the site, and he shall make good such damage or loss without any additional cost to the Owner.
   EXISTING IMPROVEMENTS - PROTECTION
- a) The Contractor shall be entirely responsible for all injuries to water pipes, electric conduits or cables, drains, sewers, gas mains, poles, telephones and telegraph lines, streets, pavements, sidewalks, curbs, culverts, retaining walls, building walls, foundation walls, or other structures of any kind met with during the progress of the Work, and shall be liable for damages to public or private property resulting therefrom.

#### C. CONSTRUCTION ACCESS, ROADS, AND PARKING AREAS

- 1. CONTRACTOR'S USE OF PREMISES
  - a) The Contractor shall require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.
- 2. CONSTRUCTION ACCESS
  - a) To avoid traffic conflict with vehicles of the Owner's employees and customers, and to avoid over-loading of streets and driveways elsewhere on the Owner's property, limit the access of trucks and equipment to the route shown (IF SHOWN) on the Drawings as "Access Route". If access route is not shown on the Drawings, coordinate construction access and routes with the Owner's Project Manager.
  - b) Do not permit such vehicles to park on any street or other area of the Owner's property except in the area shown on the Drawings as "Contractor's Parking Area". If not shown on the drawings, the Contractor's Parking Area shall be as designated by the Owner's Project Manager.
    - Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.
- c) Prov 3. SECURITY
  - a) Restrict the access of all persons entering upon the Owner's property in connection with the Work to the Access Route and to the actual site of the Work.

#### D. TEMPORARY ENVIRONMENTAL CONTROLS

- 1. GENERAL
  - a) Provide temporary environmental controls at the site of the Work to ensure that construction operations have no harmful effects on adjacent properties and on members of the public who may come in proximity to the Work, and/or the employees of the Owner who are engaged in regular daily tasks and operations and are unable to be relocated to another work site during construction operations.
  - b) Owner reserves the right to stop the Work, at the Contractor's expense, until the Contractor provides necessary control measures for the conditions listed below; additionally, the Owner reserves the right to perform or have performed necessary control measures, should the Contractor refuse to do so at the time requested and to deduct the cost of those expenses from the amount due the Contractor.
- 2. DUST CONTROL

a).

b)

a)

- a) Provide dust control materials to minimize dust from construction operations. Prevent air-borne dust from dispersing into the atmosphere.
   3. WATER CONTROL
  - Control surface water to prevent damage to the project, the site and adjoining properties.
  - Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas; direct drainage to proper runoff channels or storm drainage utilities.
  - Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
  - c) Dispose of drainage water in a manner to prevent flooding, erosion silting, or runoff of silt or sediment or other damage to all portions of the site or to adjoining properties.
- 4. RODENT CONTROL
  - Provide rodent control to prevent infestation of construction or storage areas.
    - 1) Use methods and materials which will not adversely affect conditions at the site or on adjoining properties.
- 5. DEBRIS CONTROL
  - a) Maintain all areas free of extraneous debris, waste, and rubbish.

#### 6. POLLUTION CONTROL

- Prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations. a)
- Provide equipment and personnel, perform emergency measures to contain all spillages, and to remove contaminated soils or liquids. b) 1)
  - Excavate and dispose of all contaminated earth off-site. Replace with suitable compacted fill and topsoil.
- Take special measures, as necessary, to prevent harmful substances from entering public waters, including lakes, streams, intermittent c) drainage channels, and storm or sanitary sewers.

#### EROSION CONTROL 7

- a) Plan and execute construction and earthwork in a manner to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
  - Schedule the Work to minimize the areas of bare soil exposed at one time, if possible. 1)
  - 2) Provide temporary control measures such as berms, dikes, and drains to prevent runoff of silt or sediment from the site.
  - 3) Comply with Section 015713.

#### E. PROJECT IDENTIFICATION AND SIGNAGE

- GENERAL 1.
  - Provide and install project identification sign, if located and/or called out on the Drawings. a)
- 2. SUBMITTALS
  - Provide shop drawing(s) of proposed sign/sign installation to Owner's Representative for approval, prior to installation a)
- 3. INSTALLATION
  - Provide project sign as detailed on Drawings a)
  - b) If not detailed on Drawings provide project identification sign per the following minimum requirement:
    - Content 1)
      - Name of project aa)
        - bb) Name of Owner
        - Name of Architect(s) and major consultants cc)
        - dd) Names of Contractor and major subcontractors
        - Allow additional 200 characters of text explaining the project ee)
      - 2) Construction
        - Size: 4' x 8' aa)
        - Materials: Min. 5/8" AC DFPA Exterior Plywood, with (2) 4" x 4" x 12' long pressure treated post supports bb)
        - Paint: paint front and back, seal edges, provide content as approved by Owner's Representative. Conform to recognized cc) sign painting standards in selection of paint materials. Use only professional sign painter with three years minimum experience to apply sign graphics and lettering.
      - 3) Install sign in a manner consistent with length of time of construction operations. Remove sign and fill post holes at project completion.

#### F. FIELD OFFICES

TEMPORARY FACILITIES 1.

Provide and pay for temporary (new, or used if in serviceable condition) facilities and controls needed for the Work, if called out on the Drawings, which may include, but are not necessarily limited to:

- Temporary utilities such as heat, water, electricity, and telephone; a)
- Field office for the Contractor's personnel (required if shown on the Drawings; otherwise at the Contractor's option and expense). b) Conform with requirements for Engineer's Field Office Type B, as defined in Article 646.04 of the Standard Specifications for 1) Road and Bridge Construction - Illinois Department of Transportation.
- Sanitary facilities; c)
- Enclosures such as tarpaulins, barricades, and canopies; d)
- Temporary fencing of the construction site; e)
- f) Project sign.
- Comply with Federal, State, and local codes and regulations.
  - Maintain temporary facilities and controls in proper and safe condition throughout the progress of the work. The Contractor is responsible a) for conformance with all safety codes and regulations for all Work under his jurisdiction, including that of Sub-Contractors.
- 3. Locate temporary facilities as shown on the Drawings, or as approved by the Owner's Representative if not shown on the Drawings.

#### SECTION 015713 - EROSION & SEDIMENT CONTROL

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

#### B. SUMMARY 1.

2.

- This Section includes the following:
  - Site erosion and sediment control a)
  - Silt fencing b)
  - Ditch checks c)
  - d) Erosion control blankets
  - Culvert and inlet protection e)
- Stabilized entrance f) 2 Related Sections include the following:
  - Division 31 Earthwork. a)
  - Division 32 Exterior Improvements. b)

Erosion and Sediment Control Statement: The Peoria Park District takes the issue of construction related erosion and sediment control extremely 3. seriously. The Peoria Park District is a community leader in the conservation and protection of our area's natural resources. This project will be watched closely by both staff and citizens for compliance with erosion and sediment control regulations and specifications.

#### QUALITY ASSURANCE C.

- Materials and methods of construction shall comply with the following standards:
  - a) Illinois Department of Transportation
- b) City of Peoria

#### D. PRODUCTS

1

- 1. Silt Fencing
  - Fabric for silt fencing shall consist of woven or nonwoven filaments of polypropylene, polyester, or polyethylene. Fabric shall be resistant a) to degradation by ultraviolet light and heat exposure. Fabric shall be rot, insect, and mildew proof, and have a high resistance to tearing. 1)

200 (min)

250 (min)

3.5 (min)

30 (nonwoven)

600 mm (24 in.)

45 m (150 ft)

0.34 kg/sm (0.63 lb/sq yd)

50 (woven)

12

75

4.0

- Fabric shall comply with the following physical properties:
  - Grab tensile strength (lb) ASTM D4632 aa)
  - bb) Grab elongation @ break (%) - ASTM D4632
  - Burst strength (psi) ASTM D751 cc)
  - Trapezoidal tear strength (lb) ASTM D4533 dd)
  - ee) Width (ft)
  - ff) Weight (oz/sq. yd) - ASTM D3776
  - Equivalent opening size gg)
  - (EOS) sieve no. Corps of Engrs. CS-02215 hh)
- 2. Ditch Checks

c)

- Ditch checks will consist of silt fencing with the addition of wire reinforcement. a)
- b) Wire shall be 9 gauge.
  - Alternate: Straw bales may be used in lieu of silt fencing
- 3. Posts
  - Posts shall be standard "T" or "U" steel posts or wood with a minimum cross section of 3 square inches. Posts shall be a minimum of 60" a) in length. Posts shall be driven a minimum of 24" into the ground.
- Erosion Control Blankets 4.
  - Excelsior Blanket: Excelsior blanket shall consist of a machine produced mat of wood excelsior of 80% 6" or longer fiber length. The a) wood from which the excelsior blanket is cut shall be properly cured to achieve adequately curled and barbed fibers.
    - The blanket shall be of consistent thickness, with the fiber evenly distributed over the entire area of the blanket. The excelsior 1) blanket shall be covered on the top side with a 90 day biodegradable extruded plastic mesh netting having an approximate minimum opening of 16 x 16 mm (5/8 x 5/8 in.) to an approximate maximum opening of 50 x 25 mm (2 x 1 in.). The netting shall be substantially adhered to the excelsior blanket by a knitting process using biodegradable thread or by an applied degradable adhesive. The netting shall be substantially adhered to the excelsior by a knitting process using biodegradable thread. The netting shall be entwined with the excelsior blanket for maximum strength and ease of handling.
    - The excelsior blanket shall comply with the following: 2)
      - Minimum width,  $\pm 25 \text{ mm} (1 \text{ in.})$ aa)
      - bb) Minimum mass + 10%
      - Minimum length of roll, approximately cc)
    - 3) The excelsior blanket shall be smolder resistant.
- 5. Culvert And Inlet Protection
  - Culvert protection shall consist of a ditch check immediately upstream of every culvert entrance. Ditch check shall be installed to protect a) culvert interior from sedimentation.
  - Inlet protection shall consist of purpose made devices by: b)
    - Dandy Products, Inc. P. O. Box 1980 Westerville, Ohio 43086-1980 Phone: 1-800-591-2284 Fax: 740-881-2791 www.dandyproducts.com dlc@dandyproducts.com

or

NILEX. Inc. 15171 E. Fremont Drive Centennial, CO 80112 Phone: 1-800-537-4241 Fax: 303-766-1110 www.nilex.com denver@nilex.com

- "Or Equal" substitutions may be made with prior approval of Owner's Representative. c)
- Stabilized Entrance

6.

- Stabilized entrance shall consist of coarse aggregate laid over geotextile fabric. a)
- b) Dimensions: 70' long by 14' wide.
- Geotextile Fabric: as per requirements of "silt fencing". c)
- d) Aggregate: IDOT Class CA-1, CA-2, cA-3, or CA-4.

#### E. EXECUTION 1 Site Factor

2.

4

5.

- Site Erosion And Sediment Control
  - a) Contractor is responsible for fulfilling terms of City of Peoria Erosion Control Permit and all applicable portions of the "Erosion, Sediment, and Stormwater Control Ordinance of the City of Peoria".
  - b) Install control devices as shown on erosion control plan.
  - c) Install additional measures as needed to control erosion and sedimentation on the site.
- Silt Fencing Installation
  - a) Install silt fencing according to details in plans. The silt fence shall be entrenched to a minimum depth of 8".
  - b) The silt fence shall be installed on the contour, with the ends extending up-slope.
  - c) Install silt fencing before commencing site clearing work.
- 3. Ditch Check Installation
  - a) Install ditch checks according to details in plans.
  - b) Install ditch checks at locations shown on plans.
  - c) Install additional ditch checks as needed to control erosion within drainage swales as site conditions and weather dictate.
  - d) Install ditch checks immediately after swales are graded.
  - Erosion Control Blankets Installation
    - a) Install erosion control blankets as needed to control erosion in drainage swales and at the direction of the Owner's Representative.
  - b) Anchor stakes shall be driven at a spacing of 2 feet on center.
  - Culvert And Inlet Protection Installation
    - a) Install culvert protection at upstream entrances to all culverts.
    - b) Install culvert protection to intercept waterborne silt and sediment and prevent it from entering culvert pipes.
    - c) Install immediately after culvert installation.
    - d) Install inlet protection according to manufacturer's written instructions at each inlet immediately after inlet construction.
- 6. Stabilized Construction Entrance Installation
  - a) Install stabilized construction entrance and other approved measures as necessary to limit tracking of soil on to all paved surfaces.
  - b) Comply with all City of Peoria codes limiting tracking of soil on to City streets.
- 7. Maintenance
  - a) Inspect silt fences after each rainfall. Repair fencing, failures, end runs, and erosion cuts immediately.
  - b) Remove soil from silt fencing after each rainfall.
  - c) Erosion control maintenance and repair shall be considered incidental to the contract.
  - d) Tracked soil and sediment shall be removed from all paved surfaces on a daily basis.
  - e) Replace or provide new erosion and sediment control measures as needed during construction to provide protection to site and surrounding property for the entire time of construction, or until project is complete.
- 8. Close-Out
  - a) Remove silt fencing and other erosion and sediment control devices after lawn or seeding has been established.
  - b) Soil deposits remaining in place after silt fence is no longer required shall be dressed to conform to existing grade, and seeded with appropriate seed material.

#### SECTION 016000 - PRODUCT REQUIREMENTS

- A. MATERIALS AND EQUIPMENT
  - 1. STANDARD SPECIFICATIONS
    - a) Reference herein to known standard specifications of governmental agencies or technical societies shall refer to the latest edition of such specifications, adopted and published at date of these Specifications.
  - 2. MANUFACTURED ARTICLES
    - a) All manufactured articles, materials and equipment to be incorporated in the work shall be new (unless otherwise specified) and of the quality specified and shall be used, erected, installed, connected, cleaned and conditioned as directed by and in conformity with job conditions to produce the best results obtainable.
      - 1) Field measurements for all special products and materials which requires close tolerances or fitting into other items or components of the Work shall be taken on the job by the party furnishing the materials.
  - 3. QUALITY ASSURANCE
    - Per the Supplementary Instructions to Bidders, the Bidder by submission of a signed bid form, agrees to install products and equipment by brand and model name or names specified in the Technical Specifications, Divisions 02-35. Substitutions are allowed only in conformance to the following:
      - 1) <u>Proprietary Specification Requirement</u>: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
      - Semiproprietary Specification Requirement: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted
        - aa) Where either of the two cases above prevail, and the named product is accompanied by "or approved equal" substitutions will be allowed only upon written approval of the Owner's Representative <u>prior to submission of bids</u>.
      - 3) <u>Non-Proprietary Specification Requirement</u>: When the Specifications lists products or manufacturers that are available and are accompanied by "or equal", the Contractor may propose any available product that complies with the Specifications' requirements; however, the Owner's Representative shall determine if the produced item complies with those requirements.
      - 4) <u>Descriptive Specification Requirement</u>: Where Specifications describe a product or assembly listing exact characteristics required, with or without use of a brand, trade, or model name, provide a product or assembly that provides the characteristics and otherwise complies with the Contract Documents.
      - 5) <u>Performance Specification Requirement</u>: Where Specifications require compliance with performance requirements, provide products or assembly that comply with these requirements and are recommended by the manufacturer for the application indicated.

- 6) <u>Compliance with Standards, Codes, and Regulations</u>: Where the Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standard, code, or regulation specified.
- b) VISUAL MATCHING AND SELECTION. Where the Specifications require matching an established sample or call for "as selected", the Owner's Representative's decision will be final on whether a proposed product matches satisfactorily.

## B. STORAGE AND PROTECTION

- 1. GENERAL
  - a) Contractor shall provide and maintain:
    - 1) Storage for materials and equipment to be installed in Project.
    - 2) Protection and security for stored materials and equipment, on and off site.
    - 3) Protection of existing on-site elements to remain.
    - 4) Protection of adjacent properties improvements
  - 2. METHODS
    - a) Store off grade and cover with impervious material all moisture or water vulnerable materials.
    - b) Store finished products and equipment in an enclosed building, on or off site.
    - c) Maintain integrity of shipping cartons until ready for installation.
    - d) Provide separate storage for combustible and non-combustible products.
    - e) Follow storage recommendations of product and equipment manufacturers.
    - f) Other methods shall be subject to Owner's prior written approval.
  - 3. The Contractor shall maintain an emergency phone number where a contact person can be notified at any time, Sundays and holidays included, of an emergency condition due to the work which requires immediate repair or protection.

#### C. SUBSTITUTIONS

- 1. See "SECTION 016000 A. MATERIALS AND EQUIPMENT" for requirements pertaining to substitution of specified materials, products, equipment, etc.
- 2. Contractor may propose substitute materials, products, equipment, etc., after award of the Bid; however, such proposals are expected to result in a cost savings to the Owner and/or higher quality Work at no additional cost to the Owner.

#### D. WARRANTIES AND BONDS

- 1. GENERAL
  - a) This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
  - b) Warranties for the Work and products and installations of each Contractor shall be one (1) year unless specified otherwise in the individual Sections of Divisions 02 through 35.
  - c) 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 Contractors required to countersign special warranties with the Contractor.
    - 2) The responsibility of the Contractor in respect to the required warranties shall not be relieved or limited in any way by the failure of installed components, equipment, materials, etc., due to naturally occurring and/or re-occurring conditions at the site or area of the Work including, but not limited to:
      - aa) ground and soil conditions, especially as related to frost heave;
      - bb) high wind velocities (except those exceeding velocities normally used for calculating wind loading at the site of the Work);
      - cc) rain and water damage (unless caused by winds exceeding normal design limits);
      - dd) ice/snow loading on structures
      - ee) and other naturally occurring or re-occurring site conditions
    - 3) The Contractor shall notify the Owner's Representative, prior to the award of the contract, of any part or component of the Work that is, in his opinion, not designed to accommodate the existing, naturally occurring, or re-occurring conditions of the site, and whether or not a change in the proposed methods of construction, types of equipment, etc., will affect the bid price.
      - aa) Should the proposed change in construction methods, equipment type, etc., result in additional expense, the Owner reserves the right to request proposals from the other bidders and to make award the contract based on the bid amount which includes the proposed change.

#### 2. 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 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 the Contract Documents. The Contractor 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.

aa) Rejection of Warranties: The Owner reserves the rights 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.
- f) For specific warranty requirements related to landscape materials, refer to the applicable Section.
- 3. SUBMITTALS
  - a) Submit written warranties to the Owner's Representative prior to the date certified for Substantial Completion. If the Owner's Representative's Certificate of Substantial Completion designates a commencement date for warranties other that the date of Substantial
    - Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner's Representative. 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 Owner's Representative within fifteen days of completion of that designated portion of the Work.
  - b) 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.
  - c) 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.
  - d) 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 product or installation, including the name of the product, and the name, address and telephone number of the installer.
  - e) 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.
  - f) 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.

#### SECTION 017300 - EXECUTION

A. GEOTECHNICAL DATA

- 1. If the Owner has caused borings or other subsurface investigations to be made, the data or report pursuant to these investigations will be included in the Project Manual, as an Appendix, and labeled as such.
- 2. The Owner and Owner's Representative do not guarantee the accuracy or validity of the data, nor do they assume any responsibility for the Contractor's interpretation of the data.
- 3. The Contractor's may, at his option, perform additional subsurface investigation, however, it shall be at the Contractor's sole expense.

#### B. FIELD ENGINEERING

Provide such field engineering services as are required for proper completion of the Work including, but not limited to:

- 1. Establishing and maintaining lines and levels
- 2. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.
- 3. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks and control points. Preserve permanent reference points during construction.

#### C. COORDINATION OF TRADES AND SUB-CONTRACTORS

- 1. The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operation of all trades, sub-contractors, or materials and men engaged upon the work. He shall be prepared to guarantee to each of his subcontractors the dimensions which may be required for fitting of their work to all surrounding work and shall do, or cause his agents to do, all cutting, fitting, adjusting and patching necessary to make the several parts of the work come together properly and fit the work to receive, or be received by that of other contractors.
- 2. When two or more prime contracts are being executed at one time in such manner that the work on one contract may interfere with the work of another, the Owner's Representative shall decide which contractor shall cease work and which shall continue, or whether the work on both contracts may progress at the same time and in what manner.
  - a) The Contractor shall not cause any unnecessary hindrance or delay to any other contractors on the premises, and shall be responsible for all damages done to the work of other contractors caused by him or by his employees.

### D. REFERENCE AND CONTROL POINTS PROVIDED BY OWNER

In addition to layout procedures provided by the Contractor for proper performance of the Contractor's responsibilities:

- 1. Locate and protect existing control points before starting work on the site.
- 2. Preserve permanent reference points during progress of the Work.
- 3. Do not change or relocate reference points or items of the Work without specific approval from the Owner's Representative.
- 4. Promptly advise the Owner's Representative when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.
- 5. Upon direction of the Owner's Representative, require the field engineer to replace reference stakes or markers.
- 6. Locate such replacement according to the original survey control.

#### E. REFERENCE AND CONTROL POINTS PROVIDED BY THE CONTRACTOR

- 1. If not provided by the Owner (and defined as the responsibility of the Owner in the Contract Documents) establish sufficient general reference points in the form of permanent bench marks, grade stakes or other markers as will enable the Contractor to proceed with the Work.
- 2. The Contractor may lay out his own work, or cause the Work to be laid out by a qualified party such as a Registered Land Surveyor or a Professional Engineer, as necessary.
- The Contractor shall establish and be responsible for all lines, elevations and measurements of the structure utilities, installations, and other Work
  executed by him under the contract.
  - a) Exercise proper precautions to verify the figures and dimensions shown on the drawings before laying out the work; be responsible for any error resulting from failure to exercise such precaution.

#### SECTION 017329 - CUTTING AND PATCHING

#### CHASES AND OPENINGS 1. The Contractor is response

A.

- The Contractor is responsible for the provision and/or coordination of all chases, openings and recesses required by work of his own forces, subcontractors or separate contractors.
  - a) Each subcontractor or separate contractor shall be responsible for furnishing advance information to the General Contractor as to exact
  - dimensions and locations of such chases and openings, and shall provide and set in place all necessary sleeves, inserts and forms. b) Openings shall be accurately located neatly cut, and no larger than necessary. Provide all rebuilding patching refinishing and painti
  - Openings shall be accurately located, neatly cut, and no larger than necessary. Provide all rebuilding, patching, refinishing and painting required to restore the construction to original condition.
  - Provide shoring, bracing, and support as required to maintain structural integrity of the project.
- 3. Provide protection from cutting and patching operations as required for other portions of the project; protect the Work and existing improvements in proximity to the cutting and patching operations from the elements.

#### SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT & DISPOSAL

#### A. PERIODIC CLEANING

2.

1.

- 1. Each Contractor shall clean up after his own work as needed and/or ensure that sub-contractors clean up after their work and remove accumulations of waste, debris, and rubbish caused by construction operations.
  - a) Remove all waste, rubbish and debris on a daily basis (if needed), as they accumulate, and after completion of the Work.

#### B. PROJECT COMPLETION

- On completion of the project, the entire job shall be cleaned up and left in perfect condition, including adjacent areas.
- a) Marred surfaces shall be patched or repaired and touched up to match adjoining surfaces.
- b) All rubbish shall be removed from the site before acceptance.
- c) New surfaces and/or exposed elements of the Work shall be protected from stain and marring. These surfaces shall be cleaned to the satisfaction of the Owner's Representative or replaced if said stains or mars are unable to be completely removed

#### C. GOVERNMENTAL REGULATIONS

1. Conduct cleaning and disposal operations in compliance with Federal, State and local ordinances and anti-pollution laws and regulations.

### SECTION 017700 - PROJECT CLOSEOUT

### A. GENERAL

1.

1.

- Work includes:
- 1. Substantial Completion.
- 2. Final Completion
- 3. Closeout submittals.
- 4. Instruction

#### B. SUBSTANTIAL COMPLETION

- Prepare and submit the list ("punch-list") required by the first sentence of Paragraph 9.8.2 of the General Conditions.
  - a) Within a reasonable time after receipt of the list the Owner's Representative will inspect to determine status of completion. Should the Owner's Representative determine that the Work is not Substantially Complete:
    - 1) The Owner's Representative will so notify the Contractor, in writing, giving the reasons therefore.
    - 2) Remedy the deficiencies and notify the Owner's Representative when ready for reinspection.
    - 3) The Owner's Representative will reinspect the Work.
    - When the Owner's Representative concurs that the Work is Substantially Complete:
      - 1) The Owner's Representative will prepare a "Certificate of Substantial Completion" on AIA form G704, accompanied by the Contractor's list of items to be completed or corrected, as verified and approved by the Owner's Representative.
      - 2) The Owner's Representative will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

#### C. FINAL COMPLETION

b)

- Prepare and submit the notice required by the first sentence of Paragraph 9.10.1 of the General Conditions.
  - a) Verify that the Work is complete including, but not necessarily limited to, the items mentioned in Paragraph 9.8.2 of the General Conditions. Certify that:
    - 1) the Contract Documents have been reviewed;
    - 2) the Work has been inspected for compliance with the Contract Documents;
    - 3) the Work has been completed in accordance with the Contract Documents;
    - 4) equipment and systems have been tested as required, and are operational;
    - 5) the Work is completed and ready for final inspection.
    - b) The Owner's Representative will make a final inspection to verify status of completion and if all "punch-list" items have been completed, and upon receipt of the Contractor's Final Application for Payment, issue a Certificate of Final Completion. Should the Owner's Representative determine that the Work is incomplete or defective:
      - 1) The Owner's Representative will so notify the Contractor, in writing, listing the incomplete or defective work.
      - 2) Remedy the deficiencies promptly, and notify the Owner's Representative when ready for reinspection.
    - c) FINAL APPLICATION FOR PAYMENT
      - 1) Submit a final Application for Payment to the Owner's Representative, showing all adjustments to the Contract Sum.
      - 2) If needed, the Owner's Representative will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.
      - 3) Include final waivers of lien from the Contractor, sub-contractors, and major suppliers.

4) Final payment will not be released until all close-out submittals have been made, final cleaning has been performed, and required instruction(s) to Owner's personnel have been accomplished.

#### CLOSEOUT SUBMITTALS D.

- When the Owner's Representative determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals. Closeout submittals include, but are not necessarily limited to:
  - Project record documents described in "Section 017839". a)
  - b) Operation and maintenance manuals/data as described in "Section 017823".
  - Warranties and bonds as described in "Section 016000". c)
  - d) Keys and keying schedule;
  - Spare parts and materials extra stock; e)
  - Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to: f)
    - Certificates of Inspection, as required 1)
    - Certificate(s) of Occupancy 2)
  - Certificates of Insurance for products and completed operations; g) h)
    - Evidence of payment and release of liens.
      - Consent of Surety to Final Payment 1)
      - 2) Contractor's Final Waiver of Lien
      - 3) Separate releases or Waivers of Lien for sub-contractors, suppliers and others with lien rights against the Owner, together with a list of those parties.
  - i) List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

#### SECTION 017823 - OPERATING/MAINTENANCE MANUALS & INSTRUCTION

#### GENERAL Α.

1.

- 1. Compile operating/product data and related information appropriate for Owner's maintenance and operation of products and equipment provided under the Contract.
- 2. Instruct Owner's personnel in operation and maintenance of products, equipment and systems.
- OPERATIONS AND MAINTENANCE DATA REQUIRED: 3.
  - Operating and maintenance manuals are required for each area of Work which is listed below, if that area of Work is included within the a) scope of Work of the project:
    - 1) HVAC
    - Plumbing including water supply, sewage and waste disposal 2)
    - 3) Electrical
    - 4) Materials and finishes

#### Β. OPERATIONS/MAINTENANCE MANUALS - FORM OF SUBMITTAL

- Prepare operating and maintenance manuals in the form of an instructional manual, utilizing heavy-duty, durable 3-ring vinyl covered loose-leaf 1. binders, for use by the Owner's operating personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder. Provide when drawings or diagrams are required as part of the manual.
- 2 Provide sturdy manila or kraft envelope, accordion type file folder, or cardboard file boxes, properly labeled, of sufficient size to contain all submittals.
- 3. Submit one copy of data in final form at least fifteen days before final inspection. This copy will be returned within fifteen days after final inspection, with comments. After final inspection make corrections or modifications to comply with the Owner's Representative's comments and submit three copies of each approved manual to the Owner's Representative
- WARRANTIES, BONDS AND SERVICE CONTRACTS 4.
  - Provide a copy of each warranty, bond or service contract in the appropriate manual for the information of the Owner's operating a) personnel. Provide written data outlining procedures to be followed in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond. Provide list for each product containing name, address, and phone number of:
    - Contractor. 1)
    - 2) Subcontractor.
    - 3) Maintenance contractor, as appropriate.
    - Local supply source for parts and replacement. 4)
  - Identify area of responsibility of each contractor. b)

#### C. MANUAL FOR MATERIALS AND FINISHES

- Submit two (2) copies of complete manual in final form.
- 2. Refer to individual Specification Sections for additional requirements on care and maintenance of materials and finishes.
- 3. Content for products, applied materials and finishes:
  - a) Manufacturer's data, giving full information on products.
    - Catalog number, size, composition. 1)
    - 2) Color and texture designations.
    - 3) Information for re-ordering special-manufactured products.
- 4. Instructions for care and maintenance.
  - Manufacturer's recommendations for types of cleaning agents and methods. a)
  - b) Cautions against cleaning agents and methods detrimental to product.
  - Recommended cleaning and maintenance schedule. c)
- Moisture-Protection and Weather-Exposed Products: Provide complete manufacturer's data with instructions on inspection, maintenance and 5. repair of products exposed to the weather or designed for moisture-protection purposes.

- 6. Manufacturer's Data: Provide manufacturer's data giving detailed information, including the following, as applicable:
  - a) Applicable standards.
  - b) Chemical composition.
  - c) Installation details.
  - d) Inspection procedures.
  - e) Maintenance information.
  - f) Repair procedures.

### D. INSTRUCTION

- 1. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work including, but not limited to;
  - a) Mechanical
  - b) Water supply
  - c) Electrical service/distribution and lighting
  - d) Other items or systems as required in individual sections of the Technical Specifications
- 2. Instructions for the Owner's Personnel: For instruction of the Owner's operating and maintenance personnel, use experienced instructors thoroughly trained and experienced in the operation and maintenance of the equipment or system involved.

#### SECTION 017839 - PROJECT RECORD DOCUMENTS (AS-BUILTS)

- A. DOCUMENTS REQUIRED AT SITE
  - 1. The Contractor shall maintain at the job site one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders, and other Contract modifications.
    - a) Each of these project record documents shall be clearly marked "Project Record Copy"
    - b) Shall be maintained in good condition
    - c) shall be available at all times for inspection by the Park District, and shall not be used for construction purposes.
- B. Project-record drawings shall be marked up to show significant changes made during construction progress, referenced to visible and accessible features of the structures. Project-record drawings shall be kept current and no work shall be concealed until required information has been recorded.
- C. Record-documents shall be submitted in satisfactory condition to the Park District at the completion of the project. FINAL COMPLETION OF THE PROJECT WILL NOT BE ATTAINED, AND FINAL PAYMENT WILL BE WITHHELD, UNTIL PROJECT "AS-BUILTS" ARE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.

END OF GENERAL REQUIREMENTS

## ATTACHMENT A.6 INSURANCE REQUIREMENTS ROUTINE CONSTRUCTION, MAINTENANCE AND REPAIR PROJECTS

Contractor shall obtain insurance of the types and in the amounts listed below.

### A. COMMERCIAL GENERAL AND UMBRELLA LIABILITY INSURANCE

Contractor shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a limit of not less than \$1,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location.

CGL insurance shall be written on Insurance Services Office (ISO) occurrence form CG 00 01 10 93, or a substitute form providing equivalent coverage, and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

Owner shall be included as an insured under the CGL, using ISO additional insured endorsement CG 20 10 or a substitute providing equivalent coverage, and under the commercial umbrella, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance afforded to Owner.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, or underground property damage.

### **B.** CONTINUING COMPLETED OPERATIONS LIABILITY INSURANCE

Contractor shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella liability insurance with a limit of not less than \$1,000,000 each occurrence for at least one (1) year following substantial completion of the work.

Continuing CGL insurance shall be written on ISO occurrence form CG 00 01 10 93, or substitute form providing equivalent coverage, and shall, at minimum, cover liability arising from products-completed operations and liability assumed under an insured contract.

Continuing CGL insurance shall have a products-completed operations aggregate of at least two times its each occurrence limit.

Continuing commercial umbrella coverage, if any, shall include liability coverage for damage to the insured's completed work equivalent to that provided under ISO form CG 00 01.

### C. BUSINESS AUTO AND UMBRELLA LIABILITY INSURANCE

Contractor shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than \$1,000,000 each accident. Such insurance shall cover liability arising out of any auto including owned, hired and non-owned autos.

Business auto insurance shall be written on Insurance Services Office (ISO) form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

### D. WORKERS COMPENSATION INSURANCE

Contractor shall maintain workers compensation as required by statute and employers liability insurance. The commercial umbrella and/or employers liability limits shall not be less than \$1,000,000 each accident for bodily injury by accident or \$1,000,000 each employee for bodily injury by disease.

If Owner has not been included as an insured under the CGL using ISO additional insured endorsement CG 20 10 under the Commercial General and Umbrella Liability Insurance required in this Contract, the Contractor waives all rights against Owner and its officers, officials, employees, volunteers and agents for recovery of damages arising out of or incident to the Contractor's work.

### E. GENERAL INSURANCE PROVISIONS

**1. Evidence of Insurance.** Prior to beginning work, Contractor shall furnish Owner with a certificate(s) of insurance and applicable policy endorsement(s), executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements set forth above.

All certificates shall provide for 30 days written notice to Owner prior to the cancellation or material change of any insurance referred to therein. Written notice to Owner shall be by certified mail, return receipt requested.

Failure of Owner to demand such certificate, endorsement or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

Owner shall have the right, but not the obligation, of prohibiting Contractor or any subcontractor from entering the project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by Owner.

Failure to maintain the required insurance may result in termination of this Contract at Owner's option.

With respect to insurance maintained after final payment in compliance with a requirement above, an additional certificate(s) evidencing such coverage shall be promptly provided to Owner whenever requested.

Contractor shall provide certified copies of all insurance policies required above within 10 days of Owner's written request for said copies.

- 2. Acceptability of Insurers. For insurance companies which obtain a rating from A.M. Best, that rating should be no less than A VII using the most recent edition of the A.M. Best's Key Rating Guide. If the Best's rating is less than A VII or a Best's rating is not obtained, the Owner has the right to reject insurance written by an insurer it deems unacceptable.
- **3. Cross-Liability Coverage.** If Contractor's liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.
- 4. Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to the Owner. At the option of the Owner, the Contractor may be asked to eliminate such deductibles or self insured retentions as respects the Owner, its officers, officials, employees, volunteers and agents or required to procure a bond guaranteeing payment of losses and other related costs including but not limited to investigations, claim administration and defense expenses.
- **5. Subcontractors.** Contractor shall cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified above. When requested by the Owner, Contractor shall furnish copies of certificates of insurance evidencing coverage for each subcontractor.

### F. INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner and the Architect and their officers, officials, employees, volunteers and agents from and against all claims, damages, losses and expenses including but not limited legal fees (attorney's and paralegal's fees and court costs), arising

out of or resulting from the performance of the Contractor's work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property, other than the work itself, including the loss of use resulting therefrom and (2) is caused in whole or I part by any wrongful or negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except to the extent it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph. Contractor shall similarly protect, indemnify and hold and save harmless the Owner, its officiens, officials, employees, volunteers and agents against and from any and all claims, costs, causes, actions and expenses including but not limited to legal fees, incurred by reason of Contractor's breach of any of its obligations under, or Contractor's default of, any provision of the Contract.

## SAMPLE LIABILITY INSURANCE ENDORSEMENT

The following spaces preceded by an asterisk (\*) need not be completed if this endorsement and policy have the same inception date.

## This endorsement changes the policy. Please read it carefully.

## AUTOMATIC ADDITIONAL INSUREDS

The following provision is added to (SECTION II), Who Is An Insured.

5. Any entity you are required in a written contract (hereinafter called Additional Insured) to name as an insured is an insured but only with respect to liability arising out of your premises, "your work" for the Additional Insured, or acts or omissions of the Additional Insured in connection with the general supervision of "your work" to the extent set forth below.

a. The Limits of Insurance provided on behalf of the Additional Insured are not greater than those required by such contract.

- b. The coverage provided to the Additional Insured(s) is not greater than that customarily provided by the policy forms specified in and required by the contract.
- c. All insuring agreements, exclusions and conditions of this policy apply.
- d. In no event shall the coverages or Limits of Insurance in this Coverage Form be increased by such contract.

Except when required otherwise by contract, this insurance does not apply to:

- 1) "Bodily injury" or "property damage" occurring after
  - a) All work on the project (other than service, maintenance or repairs) to be performed by or on behalf of the Additional Insured(s) at the site of the covered operations has been completed; or
  - b) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.
- "Bodily injury" or "property damage" arising out of any act or omission of the Additional Insured(s) or any of their employees, other than the general supervision of work performed for the Additional Insured(s) by you.
- 3) "Property damage" to
  - a) Property owned, used or occupied by or rented to the Additional Insured(s);
  - b) Property in the care, custody or control of the Additional Insured(s) or over which the Additional Insured(s) is for any purpose exercising physical control; or

c) "Your work" for the Additional Insured(s).

With respect to Additional Insureds who are architects, engineers or surveyors, this insurance does not apply "bodily injury", "property damage", "personal injury" or "advertising injury" arising out of the rendering of or the failure to render any professional services by or for you, including:

- a) The preparing, approving, or failing to prepare or approve maps, drawings, opinions, reports, surveys, change orders, designs or specifications; and
- b) Supervisory, inspection or engineering services.

Any coverages provided hereunder shall be excess over any other valid and collectible insurance available to the Additional Insured(s) whether primary, excess, contingent or on any other basis unless a contract specifically requires that this insurance be primary or you request that it apply on a primary basis.

No person or organization is an Additional Insured with respect to the conduct of any current or past partnership or joint venture that is not shown as a Named Insured in the Declarations.

## END OF ATTACHMENT A.6

## **Project Manual for**

## **PEORIA ZOO TAKIN ENCLOSURE**

Glen Oak Park 2218 N. Prospect Road Peoria, IL 61603

OWNER:	Peoria Park District 1314 N. Park Road Peoria, IL 61603
ARCHITECT & MECHANICAL:	apace <b>Design</b> Architects + Engineers 2112 E. War Memorial Drive Peoria, IL 61614-8002 Project No. 24929.04
ELECTRICAL ENGINEER:	Keith Engineering Design Inc. 707 N.E. Jefferson Ave. Peoria, IL 61603
STRUCTURAL ENGINEER:	Hanson Professional Services Inc.

Hanson Professional Services Inc. 7625 N. University St. Suite 200 Peoria, IL 61614

Mohr and Kerr 5901 N. Prospect, Ste. 6B Peoria, IL 61614

DATE:

**CIVIL ENGINEER:** 

29 September 2015

SET NO.



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apaceDesign Architects + Engineers TABLE OF CONTENTS Project No. 2015904.00 PROJECT MANUAL FOR: PEORIA ZOO TAKIN ENCLOSURE Glen Oak Park Zoo 2218 N. Prospect Road Peoria, IL 61603 OWNER: Peoria Park District 1314 N. Park Road Peoria, IL 61603 ARCHITECT & MECHANICAL: apace**Design** Architects + Engineers 2112 E. War Memorial Drive Peoria, IL. 61614-8002 CIVIL ENGINEER: Mohr and Kerr 5901 N. Prospect, Ste. 6B Peoria, IL 61614 ELECTRICAL ENGINEER: Keith Engineering Design Inc. 707 N.E. Jefferson Ave. Peoria, IL 61603 STRUCTURAL ENGINEER: Hanson Professional Services Inc. 2900 W. Willow Knolls Road Peoria, IL 61614 DATE: 29 September 2015

<u>NOTE</u>: THESE SPECIFICATIONS UTILIZE THE (UPDATED) 2004 CSI MASTERFORMAT. CERTAIN DIVISION NUMBERS HAVE CHANGED FROM THE PREVIOUS FORMAT.

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apaceDesign Architects + Engineers Project No. 2015904.00

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SPECIFIERS: **apace**Design Architects + Engineers Architectural: Benjamin L. Kauffman Mechanical: Mark A. Cordes Tel.: (309) 685-4722 Fax: (309) 685-4784

> Keith Engineering Design Electrical: Tracy D. Caulkins Tel.: (309) 938-4005 Fax: (309) 214-0063

> Hanson Professional Services Structural: Tom DeJarld Tel.: (309) 691-0902 Fax: (309) 691-1327

Mohr and Kerr Civil: Steve Kerr Tel: (309) 692-8500 Fax: (309) 692-8501

#### SECTION 011000 - SUMMARY

#### PART 1 - GENERAL

- 1.1 SUMMARY
  - A. Section Includes:
    - 1. Project information.
      - 2. Work covered by Contract Documents.
      - 3. Phased construction.
      - 4. Work under separate contracts.
      - 5. Access to site.
      - 6. Coordination with occupants.
      - 7. Work restrictions.
      - 8. Specification and drawing conventions.
      - 9. Miscellaneous provisions.
  - B. Related Requirements:
    - Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
- 1.2 PROJECT INFORMATION
  - A. Project Identification: Peoria Zoo Takin Enclosure, 2015904.00.
     1. Project Location: Glen Oak Park, 2218 N. Prospect Road, Peoria, IL 61603.
  - B. Owner: Peoria Park District, 1125 W. Lake Ave., Peoria, IL 61614.
    1. Owner's Representative: Becky Fredrickson, 309-686-3386.
  - C. Architect: apaceDesign Architects + Engineers, 2112 E. War Memorial Drive, Peoria, IL 61614, 309-685-4722.
- 1.3 WORK COVERED BY CONTRACT DOCUMENTS
  - A. The Work of Project is defined by the Contract Documents and consists of the following:
    - 1. Project consists of site work, utilities, masonry, carpentry, caging, HVAC, electrical, plumbing, and finishes associated with the construction of the Takin Enclosure.
  - B. Type of Contract.1. Project will be constructed under a single prime contract.
- 1.4 WORK UNDER SEPARATE CONTRACTS
  - A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.
  - B. Concurrent Work: Owner has awarded or will award separate contract(s)or perform the work in-house for the following construction

operations at Project site. Those operations will be conducted simultaneously with work under this Contract.

- 1. Exterior paddock site work, concrete/stone wall tie-ins.
- 2. Fine grading, seeding, and landscaping.
- C. Subsequent Work: Owner has awarded or will award separate contract(s) or perform the work in-house for the following additional work to be performed at site following Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.
  - 1. Exterior paddock site work, concrete/stone wall tie-ins.
  - 2. Fine grading, seeding, and landscaping.

#### 1.5 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Limits: Confine construction operations to project work limited. Connections of utilities may be required beyond project limited and shall be coordinated with Owner a minimum 72 hours in advance and require a written notice to proceed from the Owner.
  - 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials, unless Owner's approves areas in writing.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

#### 1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing, adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's dayto-day operations. Maintain existing exits unless otherwise indicated.
  - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
  - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

- Zoo will remain open during construction of the project. Take extra precautions to ensure Zoo patrons safety. Hours of operation are from 10:00 AM - 5:00 PM.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
  - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
  - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
  - 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
  - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

#### 1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
  - 2. Obtain Architect's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
  - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

#### 1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

- PART 1 GENERAL
- 1.1 SUMMARY
  - A. Section includes administrative and procedural requirements for alternates.
- 1.2 DEFINITIONS
  - A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
    - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
    - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION
- 3.1 SCHEDULE OF ALTERNATES
  - A. Add Alternate No. 1: Tube Skylights.

- 1. Alternate: All work required to provide and install (3) tube skylights and all accessories necessary to provide a complete and weather tight system.
- B. Add Alternate No 1: Trench Drain Grates (Informational Bid Item).
  - 1. Alternate: This cost shall be incurred in the Base Bid only, but listed under this Alternate as in Informational Bid item only. Provide a material cost for all segments of the trench drain grates.

END OF SECTION 012300

#### SECTION 012500 - SUBSTITUTION PROCEDURES

- PART 1 GENERAL
- 1.1 SUMMARY
  - A. Section includes administrative and procedural requirements for substitutions.
  - B. Related Requirements:
    - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
- 1.2 DEFINITIONS
  - A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- 1.3 ACTION SUBMITTALS
  - A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
    - 1. Substitution Request Form: Use CSI Form 13.1A.
    - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
      - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
      - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      - e. Samples, where applicable or requested.
      - f. Certificates and qualification data, where applicable or requested.
      - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
      - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

- i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
- j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- 1. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
  - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

#### 1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.
- PART 2 PRODUCTS

#### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - Requested substitution will not adversely affect Contractor's construction schedule.
    - c. Requested substitution has received necessary approvals of authorities having jurisdiction.

- d. Requested substitution is compatible with other portions of the Work.
- e. Requested substitution has been coordinated with other portions of the Work.
- f. Requested substitution provides specified warranty.
- g. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

- 1.1 SUMMARY
  - A.Section includes administrative and procedural requirements for handling and processing Contract modifications.
- 1.2 MINOR CHANGES IN THE WORK
  - A.Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions".
- 1.3 PROPOSAL REQUESTS
  - A.Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
    - Work Change Proposal Requests issued by Architect are not 1. instructions either to stop work in progress or to execute the proposed change.
    - Within time specified in Proposal Request or 20 days, when not 2. otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      - Include a list of quantities of products required or a. eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      - Include costs of labor and supervision directly attributable с. to the change.
      - Include an updated Contractor's construction schedule that d. indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      - Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet e. Summary, " and Form 13.6C, "Proposal Worksheet Detail".
  - B.Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
    - Include a statement outlining reasons for the change and the 1. effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
    - Include a list of quantities of products required or eliminated 2. and unit costs, with total amount of purchases and credits to be

made. If requested, furnish survey data to substantiate quantities.

- Indicate applicable taxes, delivery charges, equipment rental, 3. and amounts of trade discounts.
- 4. Include costs of labor and supervision directly attributable to the change.
- Include an updated Contractor's construction schedule that 5. indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- б. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
- 7. Work Change Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail".

#### 1.4 ADMINISTRATIVE CHANGE ORDERS

- A.Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B.Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.
- 1.5 CHANGE ORDER PROCEDURES
  - A.On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
    - Change Orders are written documents describing changes in the 1. Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof. Change Orders must be signed by both the Owner and the Architect/Owner's Representative prior to proceeding with the Work subject to the Change Order. **REQUESTS** FOR "EXTRA'S" OR OTHER ADDITIONAL PAYMENTS OVER AND ABOVE THE CURRENT CONTRACT SUM WILL NOT BE CONSIDERED WITHOUT THE PRIOR, WRITTEN APPROVAL OF BOTH THE OWNER AND THE OWNER'S REPRESENTATIVE.
      - PROCESSING CHANGE ORDERS. a.
        - 1. Orders will be dated and will be numbered in sequence.
        - 2. The Change Order will describe the change or changes, or will refer to the Proposal Requests or Field Orders involved.
        - 3. The Owner's Representative will issue three copies of each Change Order to the Contractor.
        - 4. The Contractor promptly shall sign all three copies and return them to the Owner's Representative.

- 5. The Owner and Owner's Representative will retain two signed copies in their files, and will forward one signed copy to the Contractor.
- 6. Should the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
  - i. The Contractor promptly shall return all three of the Change Orders, unsigned by him, to the Owner's Representative with a letter signed by the Contractor stating the reason or reasons for the Contractor's disagreement.
  - ii. The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under pertinent provisions of the Contract Documents.
- 1.6 CONSTRUCTION CHANGE DIRECTIVE
  - A.Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
    - Construction Change Directive contains a complete description of 1. change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  - B.Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
    - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION (Not Used)

END OF SECTION 012600
## SECTION 012900 - PAYMENT PROCEDURES

### PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
  - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
  - 3. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 4. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
- 1.2 SCHEDULE OF VALUES
  - A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
    - Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
      - a. Application for Payment forms with continuation sheets.
      - b. Submittal schedule.
      - c. Items required to be indicated as separate activities in Contractor's construction schedule.
    - 2. Submit the schedule of values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
    - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
  - B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
    - 1. Identification: Include the following Project identification on the schedule of values:
      - a. Project name and location.
      - b. Name of Architect.
      - c. Architect's project number.
      - d. Contractor's name and address.
      - e. Date of submittal.
    - 2. Arrange schedule of values consistent with format of AIA Document G703.
    - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

- a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
- 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
- 6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- 8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
- 9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- 1.3 APPLICATIONS FOR PAYMENT
  - A. Applications for Payment
    - 1. Progress payments will be made only if specifically called for in the Agreement. In all other cases, the Contractor may submit an Application for Payment (3 copies) upon Substantial Completion (95% of the Contract Sum), with the balance of the Contract Sum to be paid at Final Completion.
      - a. Paragraph #52 of the Supplementary Conditions defines the documentation required for each payment request.
      - b. Applications for payment shall be delivered to the Owner's Project Manager at: Department of Planning, Design, and Construction, Peoria Park District, Bradley Park Equipment Services, 1314 N. Park Road, Peoria, IL 61604
  - B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
  - C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
  - D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of

Contractor. Architect will return incomplete applications without action.

- 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
- 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Contractor's construction schedule (preliminary if not final).
  - 4. Schedule of unit prices.
  - 5. Submittal schedule (preliminary if not final).
  - 6. List of Contractor's staff assignments.
  - 7. List of Contractor's principal consultants.
  - 8. Copies of building permits.
  - 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  - 10. Initial progress report.
  - 11. Report of preconstruction conference.
  - 12. Certificates of insurance and insurance policies.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

- 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  - 1. Evidence of completion of Project closeout requirements.
  - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  - 3. Updated final statement, accounting for final changes to the Contract Sum.
  - 4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
  - 5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
  - 6. AIA Document G707-1994, "Consent of Surety to Final Payment."
  - 7. Evidence that claims have been settled.
  - 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  - 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

- PART 1 GENERAL
- 1.1 SUMMARY
  - Section includes administrative provisions for coordinating Α. construction operations on Project including, but not limited to, the following:
    - 1. Coordination drawings.
    - 2. Requests for Information (RFIs).
    - 3. Project Web site.
    - 4. Project meetings.
  - Related Requirements: Β.
    - 1. Section 011200 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
    - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
- 1.2 DEFINITIONS
  - RFI: Request from Owner, Architect, or Contractor seeking information Α. required by or clarifications of the Contract Documents.
- INFORMATIONAL SUBMITTALS 1.3
  - Α. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
    - Name, address, and telephone number of entity performing 1. subcontract or supplying products.
    - Number and title of related Specification Section(s) covered by 2. subcontract.
    - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- 1.4 GENERAL COORDINATION PROCEDURES
  - Coordination: Coordinate construction operations included in different Α. Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
    - Schedule construction operations in sequence required to obtain 1. the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
    - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

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- 3. Make adequate provisions to accommodate items scheduled for later installation.
- Prepare memoranda for distribution to each party involved, outlining Β. special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - Prepare similar memoranda for Owner and separate contractors if 1. coordination of their Work is required.
- Administrative Procedures: Coordinate scheduling and timing of C. required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - Preparation of Contractor's construction schedule. 1.
  - Preparation of the schedule of values. 2.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.

### COORDINATION DRAWINGS 1.5

- Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation Α. is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - Content: Project-specific information, drawn accurately to a 1. scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - Indicate functional and spatial relationships of components a. of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- Coordination Drawing Organization: Organize coordination drawings as в. follows:
  - Floor Plans and Reflected Ceiling Plans: Show architectural and 1. structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
  - Plenum Space: Indicate subframing for support of ceiling and wall 2. systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.

- 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fireprotection, fire-alarm, and electrical equipment.
- Structural Penetrations: Indicate penetrations and openings 4. required for all disciplines.
- Slab Edge and Embedded Items: Indicate slab edge locations and 5. sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
- Review: Architect will review coordination drawings to confirm 6. that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.
- REQUESTS FOR INFORMATION (RFIs) 1.6
  - General: Immediately on discovery of the need for additional Α. information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
    - Architect will return RFIs submitted to Architect by other 1. entities controlled by Contractor with no response.
    - Coordinate and submit RFIs in a prompt manner so as to avoid 2. delays in Contractor's work or work of subcontractors.
  - Content of the RFI: Include a detailed, legible description of item в. needing information or interpretation and the following:
    - Project name. 1.
    - 2. Project number.
    - 3. Date.
    - 4. Name of Contractor.
    - 5. Name of Architect.
    - 6. RFI number, numbered sequentially.
    - 7. RFI subject.
    - 8. Specification Section number and title and related paragraphs, as appropriate.
    - 9. Drawing number and detail references, as appropriate.
    - 10. Field dimensions and conditions, as appropriate.
    - 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
    - 12. Contractor's signature.
    - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
  - C. RFI Forms: AIA Document G716.
  - Architect's Action: Architect will review each RFI, determine action D. required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
    - The following RFIs will be returned without action: 1.
      - a. Requests for approval of submittals.
      - b. Requests for approval of substitutions.

- Requests for coordination information already indicated in c. the Contract Documents.
- Requests for adjustments in the Contract Time or the Contract d. Sum.
- e. Requests for interpretation of Architect's actions on submittals.
- f. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
- 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
  - If Contractor believes the RFI response warrants change in а. the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized Ε. by the RFI number. Submit log weekly. Use CSI Log Form 13.2B.
  - Project name. 1.
  - 2. Name and address of Contractor.
  - 3. Name and address of Architect.
  - 4. RFI number including RFIs that were dropped and not submitted.
  - 5. RFI description.
  - 6. Date the RFI was submitted.
  - 7. Date Architect's response was received.
- On receipt of Architect's action, update the RFI log and immediately F. distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
  - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  - Identification of related Field Order, Work Change Directive, and 2. Proposal Request, as appropriate.

#### PROJECT MEETINGS 1.7

- General: Schedule and conduct meetings and conferences at Project site Α. unless otherwise indicated.
  - Attendees: Inform participants and others 1. involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  - Agenda: Prepare the meeting agenda. Distribute the agenda to all 2. invited attendees.
  - Minutes: Entity responsible for conducting meeting will record 3. significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- Preconstruction Conference: Schedule and conduct a preconstruction в. conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

- Attendees: Authorized representatives of Owner, Architect, and 1. their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- 2. Agenda: Discuss items of significance that could affect progress, including the following:
  - Tentative construction schedule. а.
  - b. Phasing.
  - с. Critical work sequencing and long-lead items.
  - d. Designation of key personnel and their duties.
  - e. Procedures for processing field decisions and Change Orders.
  - f. Procedures for RFIs.
  - g. Procedures for testing and inspecting.
  - h. Procedures for processing Applications for Payment.
  - i. Distribution of the Contract Documents.
  - j. Submittal procedures.
  - k. Preparation of record documents.
  - 1. Use of the premises and existing building.
  - m. Work restrictions.
  - n. Working hours.
  - Owner's occupancy requirements. ο.
  - p. Responsibility for temporary facilities and controls.
  - q. Procedures for moisture and mold control.
  - r. Procedures for disruptions and shutdowns.
  - s. Construction waste management and recycling.
  - t. Parking availability.
  - u. Office, work, and storage areas.
  - v. Equipment deliveries and priorities.
  - w. First aid.
  - x. Security.
  - y. Progress cleaning.
- Minutes: Entity responsible for conducting meeting will record 3. and distribute meeting minutes.
- Preinstallation Conferences: Conduct a preinstallation conference at C. Project site before each construction activity that requires coordination with other construction.
  - Attendees: Installer and representatives of manufacturers and 1 fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
  - Agenda: Review progress of other construction activities and 2. preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - Related RFIs. с.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - q. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.

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- k. Time schedules.
- Weather limitations. 1.
- Manufacturer's written instructions. m.
- Warranty requirements. n.
- o. Compatibility of materials.
- p. Acceptability of substrates.
- q. Temporary facilities and controls.
- r. Space and access limitations.
- s. Regulations of authorities having jurisdiction.
- t. Testing and inspecting requirements.
- u. Installation procedures.
- v. Coordination with other work.
- w. Required performance results.
- x. Protection of adjacent work.
- y. Protection of construction and personnel.
- Record significant conference discussions, agreements, 3. and disagreements, including required corrective measures and actions.
- Reporting: Distribute minutes of the meeting to each party 4. present and to other parties requiring information.
- Do not proceed with installation if the conference cannot be 5. successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at biweekly intervals.
  - Attendees: In addition to representatives of Owner and Architect, 1. each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - Agenda: Review and correct or approve minutes of previous 2. progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - Contractor's Construction Schedule: Review progress since the a. last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.

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- 9) Progress cleaning.
- 10) Quality and work standards.
- 11) Status of correction of deficient items.
- 12) Field observations.
- 13) Status of RFIs.
- 14) Status of proposal requests.
- 15) Pending changes.
- 16) Status of Change Orders.
- 17) Pending claims and disputes.
- 18) Documentation of information for payment requests.
- 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
  - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION (Not Used)

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

- PART 1 GENERAL
- 1.1 SUMMARY
  - Section includes administrative and procedural requirements for Α. documenting the progress of construction during performance of the Work, including the following:
    - 1. Contractor's construction schedule.
    - 2. Construction schedule updating reports.
    - 3. Daily construction reports.
    - 4. Site condition reports.

#### 1.2 DEFINITIONS

- Activity: A discrete part of a project that can be identified for Α. planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - Critical Activity: An activity on the critical path that must 1. start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- CPM: Critical path method, which is a method of planning and Β. scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- С. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- Float: The measure of leeway in starting and completing an activity. D.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
- 1.3 INFORMATIONAL SUBMITTALS
  - Format for Submittals: Submit required submittals in the following Α. format: 1. PDF electronic file.
  - Construction Schedule Updating Reports: Submit with Applications for Β. Payment.
  - Daily Construction Reports: Submit at weekly intervals. C.
  - Site Condition Reports: Submit at time of discovery of differing D. conditions.

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#### 1.4 COORDINATION

- Coordinate Contractor's construction schedule with the schedule of Α. values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
  - Secure time commitments for performing critical elements of the 1. Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
- PART 2 PRODUCTS
- 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL
  - Time Frame: Extend schedule from date established for commencement of Α. the Work to date of final completion.
    - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
  - в. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
    - Activity Duration: Define activities so no activity is longer 1. than 20 days, unless specifically allowed by Architect.
    - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
    - Submittal Review Time: Include review and resubmittal times 3. indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
    - Startup and Testing Time: Include no fewer than 15 days for 4. startup and testing.
    - Substantial Completion: Indicate completion in advance of date 5. established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
    - Punch List and Final Completion: Include not more than 30 days б. for completion of punch list items and final completion.
  - Constraints: Include constraints and work restrictions indicated in С. the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
    - 1. Phasing: Arrange list of activities on schedule by phase.
    - 2. Work under More Than One Contract: Include a separate activity for each contract.
    - Work by Owner: Include a separate activity for each portion of 3. the Work performed by Owner.
    - 4. Work Restrictions: Show the effect of the following items on the schedule:
      - a. Coordination with existing construction.
      - b. Limitations of continued occupancies.
      - c. Uninterruptible services.
      - d. Partial occupancy before Substantial Completion.

- e. Use of premises restrictions.
- f. Provisions for future construction.
- Seasonal variations. g.
- h. Environmental control.
- 5. Work Stages: Indicate important stages of construction for each major portion of the Work.
- Milestones: Include milestones indicated in the Contract Documents in D. schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- Upcoming Work Summary: Prepare summary report indicating activities Ε. scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

  - Unresolved issues.
    Unanswered Requests Unanswered Requests for Information.
  - 3. Rejected or unreturned submittals.
  - 4. Notations on returned submittals.
  - 5. Pending modifications affecting the Work and Contract Time.
- Recovery Schedule: When periodic update indicates the Work is 14 or F. more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
- 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)
  - Gantt-Chart Schedule: Submit a comprehensive, fully developed, Α. horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for commencement of the Work.
  - Preparation: Indicate each significant construction activity Β. separately. Identify first workday of each week with a continuous vertical line.
    - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

#### 2.3 REPORTS

- Daily Construction Reports: Prepare a daily construction report Α. recording the following information concerning events at Project site:
  - 1. List of subcontractors at Project site.
  - List of separate contractors at Project site. 2.
  - 3. Approximate count of personnel at Project site.
  - 4. Equipment at Project site.
  - 5. Material deliveries.
  - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
  - 7. Accidents.
  - 8. Meetings and significant decisions.
  - Unusual events. 9.
  - 10. Stoppages, delays, shortages, and losses.
  - 11. Meter readings and similar recordings.
  - 12. Emergency procedures.
  - 13. Orders and requests of authorities having jurisdiction.

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- 14. Change Orders received and implemented.
- 15. Construction Change Directives received and implemented.
- 16. Services connected and disconnected.
- 17. Equipment or system tests and startups.
- 18. Partial completions and occupancies.
- 19. Substantial Completions authorized.
- Site Condition Reports: Immediately on discovery of a difference в. between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- PART 3 EXECUTION
- 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE
  - Contractor's Construction Schedule Updating: At monthly intervals, Α. update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
    - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
    - Include a report with updated schedule that indicates every 2. change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
    - 3. As the Work progresses, indicate final completion percentage for each activity.
  - Distribution: Distribute copies of approved schedule to Architect в. Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
    - 1. Post copies in Project meeting rooms and temporary field offices.
    - When revisions are made, distribute updated schedules to the same 2. 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 performance of construction activities.

# SECTION 013300 - SUBMITTAL PROCEDURES

### PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

# 1.2 DEFINITIONS

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

## 1.3 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

## 1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed

because of need to review submittals concurrently for coordination.

- a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
  - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
  - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  - 3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.
    - 1. Location(s) where product is to be installed, as appropriate.
    - m. Other necessary identification.
  - 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
    - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
  - 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

- a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
  - 1) Project name.
  - 2) Date.
  - 3) Destination (To:).
  - 4) Source (From:).
  - 5) Name and address of Architect.
  - 6) Name of Construction Manager.
  - 7) Name of Contractor.
  - 8) Name of firm or entity that prepared submittal.
  - 9) Names of subcontractor, manufacturer, and supplier.
  - 10) Category and type of submittal.
  - 11) Submittal purpose and description.
  - 12) Specification Section number and title.
  - 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
  - 14) Drawing number and detail references, as appropriate.
  - 15) Indication of full or partial submittal.
  - 16) Transmittal number, numbered consecutively.
  - 17) Submittal and transmittal distribution record.
  - 18) Remarks.
  - 19) Signature of transmitter.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations: Identify deviations from the Contract Documents on submittals.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.
- PART 2 PRODUCTS
- 2.1 SUBMITTAL PROCEDURES
  - A. General Submittal Procedure Requirements:
    - 1. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return one copy.
    - Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.

- 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - a. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
      - b. Manufacturer's product specifications.
      - c. Standard color charts.
      - d. Statement of compliance with specified referenced standards.
      - e. Testing by recognized testing agency.
      - f. Application of testing agency labels and seals.
      - g. Notation of coordination requirements.
      - h. Availability and delivery time information.
  - 4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  - 5. Submit Product Data before or concurrent with Samples.
  - 6. Submit Product Data in the following format:
    - a. Three paper copies of Product Data unless otherwise indicated. Architect will return one copy.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
  - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
  - 3. Submit Shop Drawings in the following format:
    - a. Three opaque copies of each submittal. Architect and Construction Manager will retain two copies; remainder will be returned.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
  - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  - 2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
  - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.
      - 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Submit product schedule in the following format:
    - a. Three paper copies of product schedule or list unless otherwise indicated. Architect will return one copy.

- F. Coordination Drawings Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures.
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by

manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- U. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements."
- V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- 2.2 DELEGATED-DESIGN SERVICES
  - A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
    - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
  - B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
    - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

- 3.1 CONTRACTOR'S REVIEW
  - A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
  - B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
  - C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

## 3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

SECTION 014000 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Requirements for Contractor to provide quality-assurance and control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.
  - 3. Specific test and inspection requirements are not specified in this Section.

## 1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
  - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

## 1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
  - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
  - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

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B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

# 1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 12. Name and signature of laboratory inspector.
  - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
  - 1. Name, address, and telephone number of representative making report.
  - 2. Statement on condition of substrates and their acceptability for installation of product.
  - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.
- 1.6 QUALITY ASSURANCE
  - A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

- c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
- d. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
- 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
  - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
  - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
    - a. Allow seven days for initial review and each re-review of each mockup.
  - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 6. Demolish and remove mockups when directed unless otherwise indicated.
- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.
- 1.7 QUALITY CONTROL
  - A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
    - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
    - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
  - B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
    - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these qualitycontrol services.
      - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

- 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
- 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
- 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  - Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  - 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.

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- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- 1.8 SPECIAL TESTS AND INSPECTIONS
  - A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections and as follows:
    - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
    - 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
    - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
    - Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
    - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
    - 6. Retesting and reinspecting corrected work.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION
- 3.1 TEST AND INSPECTION LOG
  - A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
    - 1. Date test or inspection was conducted.
    - 2. Description of the Work tested or inspected.
    - 3. Date test or inspection results were transmitted to Architect.
    - 4. Identification of testing agency or special inspector conducting test or inspection.
  - B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
- 3.2 REPAIR AND PROTECTION
  - A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
    - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as

invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

- PART 1 GENERAL
- 1.1 SUMMARY
  - Section includes requirements for temporary utilities, support Α. facilities, and security and protection facilities.
  - в. Related Requirements: Section 011000 "Summary" for work restrictions and limitations on 1. utility interruptions.
- USE CHARGES 1.2
  - General: Installation and removal of and use charges for temporary Α. facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Architect, testing agencies, and authorities having jurisdiction.
  - Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and в. without payment of use charges. Provide connections and extensions of services as required for construction operations.
  - С. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- 1.3 INFORMATIONAL SUBMITTALS
  - Site Plan: Show temporary facilities, utility hookups, staging areas, Α. and parking areas for construction personnel.
  - в. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - С. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.
- 1.4 OUALITY ASSURANCE
  - Electric Service: Comply with NECA, NEMA, and UL standards and Α. regulations for temporary electric service. Install service to comply with NFPA 70.
  - Tests and Inspections: Arrange for authorities having jurisdiction to в. test and inspect each temporary utility before use. Obtain required certifications and permits.

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Accessible Temporary Egress: Comply with applicable provisions in [the с. U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines] [and] [ICC/ANSI A117.1].

### 1.5 PROJECT CONDITIONS

- Temporary Use of Permanent Facilities: Engage Installer of each Α. permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- PART 2 PRODUCTS

### 2.1 MATERIALS

- Α. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
- TEMPORARY FACILITIES 2.2
  - Field Offices, General: Prefabricated or mobile units with serviceable Α. finishes, temperature controls, and foundations adequate for normal loading.
  - Common-Use Field Office: Of sufficient size to accommodate needs of в. Owner, Architect and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.
  - C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

#### 2.3 EQUIPMENT

- Fire Extinguishers: Portable, UL rated; with class and extinguishing Α. agent as required by locations and classes of fire exposures.
- HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, в. provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - Use of gasoline-burning space heaters, open-flame heaters, or 1. salamander-type heating units is prohibited.
  - Heating Units: Listed and labeled for type of fuel being 2. consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of eight at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

PART 3 - EXECUTION

- 3.1 INSTALLATION, GENERAL
  - A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work. 1. Locate facilities to limit site disturbance as specified in
    - Section 011000 "Summary."
  - Provide each facility ready for use when needed to avoid delay. Do not в. remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
- 3.2 TEMPORARY UTILITY INSTALLATION
  - Α. General: Install temporary service or connect to existing service. Arrange with utility company, Owner, and existing users for time 1. when service can be interrupted, if necessary, to make connections for temporary services.
  - Sewers and Drainage: Provide temporary utilities to remove effluent в. lawfully.
    - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
  - Water Service: Connect to Owner's existing water service facilities. C. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
  - Sanitary Facilities: Provide temporary toilets, wash facilities, and D. drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  - Heating and Cooling: Provide temporary heating and cooling required by Ε. construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
  - Ventilation and Humidity Control: Provide temporary ventilation F. required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

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- Lighting: Provide temporary lighting with local switching that н. provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- Telephone Service: Provide temporary telephone service in common-use I. facilities for use by all construction personnel. Install one telephone line(s) for each field office.
  - 1. Provide additional telephone lines for the following:
    - Provide a dedicated telephone line for each facsimile machine a. in each field office.
  - 2. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - q. Owner's office.
    - h. Principal subcontractors' field and home offices.
  - Provide superintendent with cellular telephone or portable two-3. way radio for use when away from field office.
- 3.3 SUPPORT FACILITIES INSTALLATION
  - General: Comply with the following: Α.
    - Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building 1. lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
    - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
  - Traffic Controls: Comply with requirements of authorities having в. jurisdiction.
    - Protect existing site improvements to remain including curbs, 1. pavement, and utilities.
    - Maintain access for fire-fighting equipment and access to fire 2. hydrants.
  - Parking: Use designated areas of Owner's existing parking areas for C. construction personnel.
  - D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
    - Dispose of rainwater in a lawful manner that will not result in 1. flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
    - 2. Remove snow and ice as required to minimize accumulations.

- Project Signs: Provide Project signs as indicated. Unauthorized signs Ε. are not permitted.
  - Identification Signs: Provide Project identification signs as 1. indicated on Drawings.
  - Temporary Signs: Provide other signs as indicated and as required 2. to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 3. Maintain and touchup signs so they are legible at all times.
- Waste Disposal Facilities: Comply with requirements specified in F. Section 017419 "Construction Waste Management and Disposal."
- Lifts and Hoists: Provide facilities necessary for hoisting materials G. and personnel.
  - Truck cranes and similar devices used for hoisting materials are 1. considered "tools and equipment" and not temporary facilities.
- SECURITY AND PROTECTION FACILITIES INSTALLATION 3.4
  - Α. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  - Environmental Protection: Provide protection, operate temporary в. facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - Temporary Erosion and Sedimentation Control: Provide measures to C. prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - Stormwater Control: Comply with requirements of authorities having D. jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
  - Tree and Plant Protection: Install temporary fencing located as Ε. indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
  - Pest Control: Engage pest-control service to recommend practices to F. minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
  - Extent of Fence: As required to enclose entire Project site or 1. determined sufficient to accommodate construction portion operations.
  - Maintain security by limiting number of keys and restricting 2. distribution to authorized personnel. Furnish one set of keys to Owner.
  - 3. Fence shall include opaque fabric or blanket to not allow direct line of site into project area from public area.
- Security Enclosure and Lockup: Install temporary enclosure around н. partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day. Watchman Service 1.
  - The Owner will not be responsible for loss due to theft or а. other damage which is not covered under Property Insurance. The Contractor shall make arrangements for watchman service as he considers necessary and he shall be responsible for all loss or damage of his property, equipment, material, etc. at the site, and he shall make good such damage or loss without any additional cost to the Owner.
- Barricades, Warning Signs, and Lights: Comply with requirements of I. authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- Temporary Egress: Maintain temporary egress from existing occupied J. facilities as indicated and as required by authorities having jurisdiction.
- Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, Κ. other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - Where heating or cooling is needed and permanent enclosure is not 1. complete, insulate temporary enclosures.
- Temporary Fire Protection: Install and maintain temporary fire-L. protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire prevention program.
  - Prohibit smoking in construction areas. 1.
  - Supervise welding operations, combustion-type temporary heating 2. units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - Develop and supervise an overall fire-prevention and -protection 3. program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - Provide temporary standpipes and hoses for fire protection. Hang 4. hoses with a warning sign stating that hoses are for fire-

protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

- 3.5 MOISTURE AND MOLD CONTROL
  - Contractor's Moisture Protection Plan: Avoid trapping water in Α. finished work. Document visible signs of mold that may appear during construction.
  - Exposed Construction Phase: Before installation of weather barriers, в. when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.
  - Partially Enclosed Construction Phase: After installation of weather С. barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
    - Do not load or install drywall or other porous materials or 1. components, or items with high organic content, into partially enclosed building.
    - 2. Keep interior spaces reasonably clean and protected from water damage.
    - 3. Discard or replace water-damaged and wet material.
    - 4. Discard, replace, or clean stored or installed material that begins to grow mold.
    - 5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
  - Controlled Construction Phase of Construction: After completing and D. sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
    - Control moisture and humidity inside building by maintaining 1. effective dry-in conditions.
    - Remove materials that can not be completely restored to their 2. manufactured moisture level within 48 hours.
- OPERATION, TERMINATION, AND REMOVAL 3.6
  - Α. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
  - Maintenance: Maintain facilities in good operating condition until в. removal.
    - Maintain operation of temporary enclosures, heating, cooling, 1. humidity control, ventilation, and similar facilities on a 24hour basis where required to achieve indicated results and to avoid possibility of damage.
  - Temporary Facility Changeover: Do not change over from using temporary C. security and protection facilities to permanent facilities until Substantial Completion.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - At Substantial Completion, repair, renovate, and clean permanent 2. facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

## SECTION 016000 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
  - 1. Warranties for the Work and products and installations of each Contractor shall be one (1) year unless specified otherwise in the individual sections of Divisions 02 through 35.
- B. Related Requirements:
  - 1. Section 012500 "Substitution Procedures" for requests for substitutions.

## 1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

# 1.3 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will

notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.
- 1.4 QUALITY ASSURANCE
  - A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING
  - A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
  - B. Delivery and Handling:
    - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
    - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
    - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
    - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
  - C. Storage:
    - 1. Store products to allow for inspection and measurement of quantity or counting of units.
    - 2. Store materials in a manner that will not endanger Project structure.
    - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
    - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
    - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
    - 6. Protect stored products from damage and liquids from freezing.

# 1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  - 1. Manufacturer's Standard Form: Modified to include Projectspecific information and properly executed.
  - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  - 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Warranty Requirements
  - 1. 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.
  - 2. Reinstatement of Warranty: When Work covered has failed and 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.
  - 3. 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 the Contract Documents. The Contractor 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.
  - 4. 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.
    - a. Rejection of Warranties: The Owner reserves the rights to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
  - 5. 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.

- D. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."
- PART 2 PRODUCTS
- 2.1 PRODUCT SELECTION PROCEDURES
  - A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
    - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
    - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
    - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
    - 4. Where products are accompanied by the term "as selected," Architect will make selection.
    - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  - B. Product Selection Procedures:
    - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - 3. Products:
      - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
      - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
    - 4. Manufacturers:
      - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
      - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the

manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
  - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
- 2.2 COMPARABLE PRODUCTS
  - A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
    - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
    - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - 3. Evidence that proposed product provides specified warranty.
    - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
    - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

## SECTION 017300 - EXECUTION

### PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for limits on use of Project site.
  - Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

# 1.2 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- C. Certified Surveys: Submit two copies signed by land surveyor.
- 1.3 QUALITY ASSURANCE
  - A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
  - B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
    - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
    - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their

capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

- 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- PART 2 PRODUCTS

# 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of inplace materials.
- PART 3 EXECUTION
- 3.1 EXAMINATION
  - A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
    - Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and waterservice piping; underground electrical services, and other utilities.
    - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
  - B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
    - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
    - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
    - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

## 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish limits on use of Project site.
  - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 4. Inform installers of lines and levels to which they must comply.
  - 5. Check the location, level and plumb, of every major element as the Work progresses.
  - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
  - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

# 3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

# 3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.
- 3.6 CUTTING AND PATCHING
  - A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
    - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
  - C. Temporary Support: Provide temporary support of work to be cut.
  - D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
  - E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

## 3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

# 3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements"
- 3.9 PROTECTION OF INSTALLED CONSTRUCTION
  - A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
  - B. Comply with manufacturer's written instructions for temperature and relative humidity.

## SECTION 017700 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

## 1.2 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.
- 1.3 CLOSEOUT SUBMITTALS
  - A. Certificates of Release: From authorities having jurisdiction.
  - B. Certificate of Insurance: For continuing coverage.
  - C. Field Report: For pest control inspection.
- 1.4 MAINTENANCE MATERIAL SUBMITTALS
  - A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.
- 1.5 SUBSTANTIAL COMPLETION PROCEDURES
  - A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of ten days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, keys and keying schedule, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.
  - 5. Submit test/adjust/balance records.
  - 6. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times, including nights, weekends, and holidays.
  - 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of ten days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  - 1. Advise Owner of pending insurance changeover requirements.
  - Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  - 6. Advise Owner of changeover in heat and other utilities.
  - 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  - 9. Complete final cleaning requirements, including touchup painting.
  - 10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify

Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

- 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 2. Results of completed inspection will form the basis of requirements for final completion.

## 1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
  - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
  - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report and warranty.
  - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)
  - A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
    - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
    - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
    - 3. Submit list of incomplete items in the following format:
      - a. Three paper copies unless otherwise indicated. Architect will return one copy.

- 1.8 SUBMITTAL OF PROJECT WARRANTIES
  - A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
  - B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
    - 1. Bind warranties and bonds in heavy-duty, three-ring, vinylcovered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
    - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
    - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
  - C. Provide additional copies of each warranty to include in operation and maintenance manuals.
- PART 2 PRODUCTS

# 2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
- PART 3 EXECUTION
- 3.1 FINAL CLEANING
  - A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
  - B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
    - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
- b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
- c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
- d. Remove tools, construction equipment, machinery, and surplus material from Project site.
- e. Remove snow and ice to provide safe access to building.
- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Sweep concrete floors broom clean in unoccupied spaces.
- i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- k. Remove labels that are not permanent.
- 1. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- p. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- 3.2 REPAIR OF THE WORK
  - A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
  - B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that

cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

- 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
- 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
  - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
- 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

SECTION 017823 - OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

#### 1.1 SUMMARY

- Section includes administrative and procedural requirements for Α. preparing operation and maintenance manuals, including the following:
  - Operation and maintenance documentation directory. 1.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Product maintenance manuals.
  - 5. Systems and equipment maintenance manuals.
- 1.2 CLOSEOUT SUBMITTALS
  - Manual Content: Operations and maintenance manual content is specified Α. in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
    - Architect will comment on whether content of operations and 1. maintenance submittals are acceptable.
    - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
  - Format: Submit operations and maintenance manuals in the following в. formats:
    - PDF electronic file. Assemble each manual into a composite 1. electronically indexed file. Submit on digital media acceptable to Architect.
      - Name each indexed document file in composite electronic index а. with applicable item name. Include a complete electronically linked operation and maintenance directory.
      - Enable inserted reviewer comments on draft submittals. b.
    - Three paper copies. Include a complete operation and maintenance 2. directory. Enclose title pages and directories in clear plastic sleeves. Architect will return zero copies.
  - Manual Submittal: Submit each manual in final form prior to requesting C. inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
    - Correct or revise each manual to comply with Architect's 1. comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

# PART 2 - PRODUCTS

- REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS 2.1
  - Α. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.

- Organization: Unless otherwise indicated, organize each manual into a в. separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - Title page. 1.
  - 2. Table of contents.
  - 3. Manual contents.
- Title Page: Include the following information: C.
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Name and address of Owner.
  - 4. Date of submittal.
  - 5. Name and contact information for Contractor.
  - 6. Name and contact information for Construction Manager.
  - 7. Name and contact information for Architect.
  - 8. Name and contact information for Commissioning Authority.
  - 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  - 10. Cross-reference to related systems in other operation and maintenance manuals.
- Table of Contents: List each product included in manual, identified by D. product name, indexed to the content of the volume, and crossreferenced to Specification Section number in Project Manual.
- Manual Contents: Organize into sets of manageable size. Arrange Е. contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- Manuals, Electronic Files: Submit manuals in the form of a multiple F. file composite electronic PDF file for each manual type required.
  - Electronic Files: Use electronic files prepared by manufacturer 1. where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- Manuals, Paper Copy: Submit manuals in the form of hard copy, bound G. and labeled volumes.
  - Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf 1. binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - Identify each binder on front and spine, with printed title a. "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate

Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

- 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
- 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
- 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
  - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

# 2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
  - 1. Type of emergency.
  - 2. Emergency instructions.
  - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
  - 1. Fire.
  - 2. Flood.
  - 3. Gas leak.
  - 4. Water leak.
  - 5. Power failure.
  - 6. Water outage.
  - 7. System, subsystem, or equipment failure.
  - 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
  - 1. Instructions on stopping.
  - 2. Shutdown instructions for each type of emergency.
  - 3. Operating instructions for conditions outside normal operating limits.
  - 4. Required sequences for electric or electronic systems.
  - 5. Special operating instructions and procedures.

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## 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  - 2. Performance and design criteria if Contractor is delegated design responsibility.
  - 3. Operating standards.
  - 4. Operating procedures.
  - 5. Operating logs.
  - 6. Wiring diagrams.
  - 7. Control diagrams.
  - 8. Piped system diagrams.
  - 9. Precautions against improper use.
  - 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
  - 1. Product name and model number. Use designations for products indicated on Contract Documents.
  - 2. Manufacturer's name.
  - 3. Equipment identification with serial number of each component.
  - 4. Equipment function.
  - 5. Operating characteristics.
  - 6. Limiting conditions.
  - 7. Performance curves.
  - 8. Engineering data and tests.
  - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
  - 1. Startup procedures.
  - 2. Equipment or system break-in procedures.
  - 3. Routine and normal operating instructions.
  - 4. Regulation and control procedures.
  - 5. Instructions on stopping.
  - 6. Normal shutdown instructions.
  - 7. Seasonal and weekend operating instructions.
  - 8. Required sequences for electric or electronic systems.
  - 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

# 2.4 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For

each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
- 2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS
  - A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
  - B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
  - C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
    - 1. Standard maintenance instructions and bulletins.
    - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
    - 3. Identification and nomenclature of parts and components.
    - 4. List of items recommended to be stocked as spare parts.
  - D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
    - 1. Test and inspection instructions.

- 2. Troubleshooting guide.
- 3. Precautions against improper maintenance.
- 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- 5. Aligning, adjusting, and checking instructions.
- 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
- PART 3 EXECUTION
- 3.1 MANUAL PREPARATION
  - A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
  - B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
  - C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
  - D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  - E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
    - 1. Do not use original project record documents as part of operation and maintenance manuals.

Comply with Section 017700 "Closeout Procedures" for schedule for F. submitting operation and maintenance documentation.

# SECTION 017839 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

- 1.1 SUMMARY
  - A. 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 Requirements:
    - 1. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
- 1.2 CLOSEOUT SUBMITTALS
  - A. Record Drawings: Comply with the following:
    - 1. Number of Copies: Submit one set of marked-up record prints.
    - 2. Number of Copies: Submit copies of record Drawings as follows:
      - a. Initial Submittal:
        - 1) Submit one paper-copy set of marked-up record prints.
        - Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
      - b. Final Submittal:
        - 1) Submit three paper-copy sets of marked-up record prints.
        - 2) Submit PDF electronic files of scanned record prints and three sets of prints.
        - 3) Print each drawing, whether or not changes and additional information were recorded.
  - B. Record Specifications: Submit one paper copy and one annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
  - C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

# PART 2 - PRODUCTS

## 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
  - 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 provide information for preparation of corresponding 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. Record data as soon as possible after obtaining it.
- c. Record and check the markup before enclosing concealed installations.
- 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. 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. Format: Annotated PDF electronic file.
  - 3. 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 manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy and scanned PDF electronic file(s) of marked-up paper copy of Specifications.

# 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 Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy and scanned PDF electronic file(s) of marked-up paper copy of Product Data.
- 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 revisions to project record documents as they occur; do not wait until 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 and Construction Manager's reference during normal working hours.

SECTION 017900 - DEMONSTRATION AND TRAINING

### PART 1 - GENERAL

# 1.1 SUMMARY

- A. 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.
  - 3. Demonstration and training video recordings.

### 1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and 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. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

# 1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals and in PDF electronic file format on compact disc.

# 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. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

# 1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. 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
  - A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
  - 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 as applicable to the system, equipment, or component:
    - 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.
      - 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.
- 1. 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

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

# 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.
  - 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 with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- 3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS
  - A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
    - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
  - B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Architect.
SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Demolition and removal of selected site elements.
  - 2. Salvage of existing items to be reused or recycled.

#### 1.2 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
- B. Schedule of selective demolition activities with starting and ending dates for each activity.
- C. Predemolition photographs or video.

#### 1.4 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

### 1.5 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

## 1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.
- PART 2 PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

## PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Inventory and record the condition of items to be removed and salvaged.

- 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
  - A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
  - B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
    - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
    - 2. Arrange to shut off utilities with utility companies.
    - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
    - Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
      - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
      - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

#### 3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

# 3.4 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads,

streets, walks, walkways, and other adjacent occupied and used facilities.

- C. Removed and Salvaged Items:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
  - 1. Clean and repair items to functional condition adequate for intended reuse.
  - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

# 3.5 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
  - 1. Section 312000 "Earth Moving" for drainage fill under slabs-ongrade.

## 1.2 ACTION SUBMITTALS

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

## 1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.
- C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.

## 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

## 1.5 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1.
  - 1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M).

# PART 2 - PRODUCTS

#### 2.1 CONCRETE, GENERAL

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

### 2.2 FORM-FACING MATERIALS

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

## 2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

## 2.4 CONCRETE MATERIALS

- A. Cementitious Materials:
  - 1. Portland Cement: ASTM C 150, Type I gray..
  - 2. Fly Ash: ASTM C 618, Class F or C.

- A. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
  - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- B. Air-Entraining Admixture: ASTM C 260/C 260M.
- C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
- D. Water: ASTM C 94/C 94M and potable.

# 2.5 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with a permeance of less than 0.01 perms [grains/(ft<sup>2</sup> · hr · inHg)] per ASTM E 1745 Section 7. Thickness: 15 mils minimum. Maintain permeance of less than 0.01 perms after mandatory conditioning tests per ASTM E 154 Sections 8, 11, 12, and 13. Include manufacturer's recommended adhesive or pressure-sensitive tape.
  - 1. <u>Products</u>: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following]:
    - a. Stego Industries, LLC; Stego Wrap 15 mil Calss A.
    - b. <u>Grace Construction Products</u>, W. R. Grace & Co.; Florprufe 120.
    - c. Insulation Solutions, Inc.; Viper VaporCheck II 15-mil.
    - d. Meadows, W. R., Inc.; Perminator 15 mil.

## 2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

- 2.7 CONCRETE MIXTURES, GENERAL
  - A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301 (ACI 301M).
  - B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
    1. Fly Ash: 25 percent.
  - C. Admixtures: Use admixtures according to manufacturer's written instructions.
    - 1. Use water-reducingadmixture in concrete, as required, for placement and workability.
    - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
    - 3. Use water-reducing admixture in pumped concrete, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  - A. Moisture Vapor Reduction Concrete Admixture:
    - 1. Products:
      - a. Concure Systems Admixture by Concure Systems, Phoenix, AZ. Phone 800-820-7171.
      - b. Barrier One International moisture vapor reduction admixture; 522 S. Hunt Club Blvd. #303, Apopka, FL 32703, Phone 407-374-0210.
    - 2. Utilize in all interior concrete flatwork.
    - Manufacturer's technical representative shall be on site during all mixing and placing of products. Include cost of representative on site in bid price.
    - 4. Accessory Materials: Crack Fill Binder.

## 2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings and foundation walls: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 4000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
  - 3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
  - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
- A. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 4000 psi at 28 days.
  - 2. Minimum Cementitious Materials Content: 540 lb/cu. yd. for 3/4inch nominal maximum aggregate size.
  - 3. Slump Limit: 5 inches, plus or minus 1 inch (25 mm).
  - 4. Moisture Vapor Reduction Admixture: For mix designs ranging from 0.42 to 0.52 w/cm, dose at 14 ounces per 100 pounds of total cementitious materials. Remove an equal amount of water from the mix. Add separately from other admixtures at the tail end of the

load. Mix designs below 0.42 and above 0.52 may require adjustment. Comply with admixture manufacturer's requirements.

#### 2.9 FABRICATING REINFORCEMENT

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

## 2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  - When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

#### PART 3 - EXECUTION

#### 3.1 FORMWORK INSTALLATION

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

## 3.2 EMBEDDED ITEM INSTALLATION

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

### 3.3 VAPOR-RETARDER INSTALLATION

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

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

#### 3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

### 3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301 (ACI 301M).

## 3.1 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  - Apply to exterior concrete surfaces exposed to public view, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
  - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

## 3.1 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.

## 3.2 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written

instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
  - 3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

## 3.3 CONCRETE SURFACE REPAIRS

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

### 3.1 FIELD QUALITY CONTROL

- A. Testing: Engage and pay for a qualified testing agency to perform field tests and prepare test reports.
- B. Inspections: Engage and pay for a special inspector to perform building code-required inspections.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - Testing Frequency: Obtain at least one composite sample for each 50 cu. yd. or fraction thereof of each concrete mixture placed each day.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

- Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
- 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
- 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
- 5. Compression Test Specimens: ASTM C 31/C 31M.
  - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
- Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
  - a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
- 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- 9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- 11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
- 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

SECTION 034500 - PRECAST ARCHITECTURAL CONCRETE

PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes architectural precast concrete cladding and loadbearing units.

## 1.2 DEFINITIONS

A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

## 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- C. Shop Drawings:
  - 1. Detail fabrication and installation of architectural precast concrete units.
  - Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
  - 3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
  - 4. Indicate details at building corners.
- D. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches (300 by 300 by 50 mm).

## 1.4 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material Test Reports: For aggregates.

## 1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

- 1. Designated as a PCI-certified plant for Group A, Category A1 Architectural Cladding and Load Bearing Units.
- B. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D.1.1M, "Structural Welding Code - Steel"; and AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

#### 1.6 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

# PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Design Standards: Comply with ACI 318 (ACI 318M) and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.
- B. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding design loads indicated within limits and under conditions indicated.

# 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn galvanized steel wire into flat sheets.
- D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.
- E. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

## 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or Type III, gray, unless otherwise indicated.
  - 1. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source.
- B. Supplementary Cementitious Materials:
  - 1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
  - 2. Metakaolin: ASTM C 618, Class N.
  - 3. Silica Fume: ASTM C 1240, with optional chemical and physical requirement.
  - 4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  - 5. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blastfurnace slag, Type IP, portland-pozzolan, Type I (PM), pozzolanmodified Portland, Type I (SM), slag-modified portland cement.
- C. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33/C 33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
  - 1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
    - a. Gradation: Gap graded.
  - Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.
- D. Coloring Admixture: ASTM C 979/C 979M, synthetic or natural mineraloxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.
- E. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
- F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

## 2.4 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.

- B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.
- C. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.
- D. Carbon-Steel Structural Tubing: ASTM A 500/A 500M, Grade B or Grade C.
- E. Deformed-Steel Wire or Bar Anchors: ASTM A 496/A 496M or ASTM A 706/A 706M.
- F. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A or ASTM F 1554, Grade 36 (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563 (ASTM A 563M); and flat, unhardened steel washers, ASTM F 844.
- G. High-Strength Bolts and Nuts: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563 (ASTM A 563M); and hardened carbon-steel washers, ASTM F 436 (ASTM F 436M).
- H. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123/A 123M or ASTM A 153/A 153M electrodeposition according to ASTM B 633, SC 3, Types 1 and 2.
  - 1. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035B or SSPC-Paint 20.

# 2.5 GROUT MATERIALS

- A. Sand-Cement Grout: Portland cement, ASTM C 150/C 150M, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.
- B. Nonmetallic, Nonshrink Grout: Packaged, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218/C 1218M.
- C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C 881/C 881M, of type, grade, and class to suit requirements.

## 2.6 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.

- B. Limit use of fly ash and ground granulated blast-furnace slag to 20 percent of portland cement by weight; limit metakaolin and silica fume to 10 percent of portland cement by weight.
- C. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
- D. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 (ACI 318M) or PCI MNL 117 when tested according to ASTM C 1218/C 1218M.
- E. Normal-Weight Concrete Mixtures: Proportion mixtures by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normalweight concrete with the following properties:
  - 1. Compressive Strength (28 Days): 5000 psi (34.5 MPa) minimum.
- F. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.
- G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.
- H. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

## 2.7 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
  - Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.
- D. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement. Provide minimum temperature and shrinkage reinforcement, or to resist design loading, whichever requires greater reinforcing.

- E. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- F. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- G. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch (25 mm) or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- H. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
  - 1. Place backup concrete mixture to ensure bond with face-mixture concrete.
- I. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
  - 1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants." Ensure adequate bond between face and backup concrete, if used.
- J. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- K. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.
- L. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- M. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

# 2.8 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

## 2.9 FINISHES

- A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved sample panels and as follows:
  - 1. PCI's "Architectural Precast Concrete Color and Texture Selection Guide," of plate numbers indicated. Architect to select color from full range of manufacturer' colors.
  - 2. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid attach.
  - 3. Honed Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
  - 4. Polished Finish: Use continuous mechanical abrasion with fine grit, followed by filling and rubbing procedures.
  - 5. Sand-Embedment Finish: Use selected stones placed in a sand bed in bottom of mold, with sand removed after curing.
- B. Finish exposed back surfaces of architectural precast concrete units to match face-surface finish.
- C. Finish unexposed surfaces of architectural precast concrete units with as cast finish.
- 2.10 SOURCE QUALITY CONTROL
  - A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect according to PCI TR-6, ASTM C 1610/C 1610M, ASTM C 1611/C 1611M, ASTM C 1621/C 1621M, and ASTM C 1712.
- PART 3 EXECUTION

## 3.1 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.
- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
  - 1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
  - Unless otherwise indicated, maintain uniform joint widths of 3/4 inch (19 mm).

- C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
- D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
- E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
- F. Grouting or Dry-Packing Connections and Joints: Grout connections where required or indicated. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff drypack grout material, tamping until voids are completely filled. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Keep grouted joints damp for not less than 24 hours after initial set.

# 3.2 ERECTION TOLERANCES

A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.

## 3.3 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet (6 m).
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780/A 780M.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

#### 3.4 CLEANING

A. Clean surfaces of precast concrete units exposed to view.

- B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
  - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
  - Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034500

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Decorative concrete masonry units.

## 1.2 DEFINITIONS

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

### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type and color of exposed masonry unit and colored mortar.

# 1.4 INFORMATIONAL SUBMITTALS

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

## 1.5 FIELD CONDITIONS

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

PART 2 - PRODUCTS

### 2.1 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

#### 2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
  - 1. <u>Manufacturers</u>: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. ACM Chemistries.
    - b. BASF Corporation; Construction Systems.
    - c. Grace Construction Products; W.R. Grace & Co. -- Conn.
- C. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
  - 2. Density Classification: Normal weight.
- D. Decorative CMUs: ASTM C 90.
  - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - a. Trenwyth Industries.
    - b. York Building Products.
    - c. Old Castle Masonry.
  - 2. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi .
  - 3. Density Classification: Normal weight.
  - 4. Pattern and Texture:

a. Standard pattern, split-face finish. Color to be selected by Architect from manufacturer's full range of colors.

#### 2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
  - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - a. Cemex S.A.B. de C.V.
    - b. Essroc.
    - c. Holcim (US) Inc.
    - d. Lafarge North America Inc.
    - e. Lehigh Hanson; HeidelbergCement Group.
- E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
  - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - a. <u>Davis Colo</u>rs.
    - b. Lanxess Corporation.
    - c. <u>Solomon Colors, Inc</u>.
- F. Colored Cement Products: Packaged blend made from portland cement and hydrated lime or masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
  - 1. Colored Portland Cement-Lime Mix:
    - a. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
      - 1) Essroc.
      - 2) Holcim (US) Inc.
      - 3) Lafarge North America Inc.
      - 4) Lehigh Hanson; HeidelbergCement Group.
  - 2. Colored Masonry Cement:
    - a. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:

- 1) Cemex S.A.B. de C.V.
- 2) Essroc.
- 3) Holcim (US) Inc.
- 4) Lafarge North America Inc.
- 5) Lehigh Hanson; HeidelbergCement Group.
- G. Aggregate for Mortar: ASTM C 144.
  - For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
  - 2. White-Mortar Aggregates: Natural white sand or crushed white stone.
  - 3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- H. Aggregate for Grout: ASTM C 404.
- I. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for glazed or pre-faced masonry units (and approved for such use by manufacturer of units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.
- J. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  - 1. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation; Construction Systems.
    - b. Euclid Chemical Company (The); an RPM company.
    - c. Grace Construction Products; W.R. Grace & Co. -- Conn.
- K. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with CMUs containing integral water repellent from same manufacturer.
  - 1. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
    - a. <u>ACM Chemistries</u>.
    - b. BASF Corporation; Construction Systems.
    - c. Euclid Chemical Company (The); an RPM company.
    - d. Grace Construction Products; W.R. Grace & Co. -- Conn.
- L. Water: Potable.
- 2.4 REINFORCEMENT
  - A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
  - B. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

- 1. Interior Walls: Hot-dip galvanized carbon steel.
- 2. Exterior Walls: Hot-dip galvanized carbon steel.
- 3. Wire Size for Side Rods: 0.187-inch (4.76-mm) diameter.
- 4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
- 5. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.
- 2.5 EMBEDDED FLASHING MATERIALS
  - A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
    - 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.
    - 2. 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.
    - Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
  - B. Flexible Flashing: Use one of the following unless otherwise indicated:
    - Copper-Laminated Flashing: 7-oz./sq. ft. (2-kg/sq. m) copper sheet bonded between two layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
      - a. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
        - 1) Advanced Building Products Inc.
        - 2) <u>Hohmann & Barnard, Inc</u>.
        - 3) York Manufacturing, Inc.
    - Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch (1.02 mm).
      - a. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
        - 1) Advanced Building Products Inc.
        - 2) <u>Carlisle Coatings & Waterproofing Inc</u>.
        - 3) Fiberweb, Clark Hammerbeam Corp.
        - 4) Grace Construction Products; W.R. Grace & Co. -- Conn.
        - 5) Heckmann Building Products, Inc.

- 6) Hohmann & Barnard, Inc.
- 7) Polyguard Products, Inc.
- 8) W. R. Meadows, Inc.
- 9) Williams Products, Inc.
- 3. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
  - a. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - 1) Du Pont.
    - 2) Hohmann & Barnard, Inc.
    - 3) Hyload, Inc.
    - 4) Mortar Net Solutions.
- EPDM Flashing: Sheet flashing product made from ethylenepropylene-diene terpolymer, complying with ASTM D 4637/D 4637M, 0.040 inch (1.02 mm) thick.
  - a. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
    - 1) Carlisle Coatings & Waterproofing Inc.
    - 2) Firestone Specialty Products.
    - 3) Heckmann Building Products, Inc.
    - 4) <u>Hohmann & Barnard</u>, Inc.
- C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- 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.

#### 2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805] [or] [PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use one of the following unless otherwise indicated:

- 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. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - 1) Advanced Building Products Inc.
    - 2) Heckmann Building Products, Inc.
    - 3) <u>Hohmann & Barnard, Inc</u>.
    - 4) <u>Wire-Bond</u>.

# 2.7 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. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
    - a. <u>Diedrich Technologies</u>, Inc.; a division of Sandell Construction Solutions.
    - b. EaCo Chem, Inc.
    - c. PROSOCO, Inc.

# 2.8 MORTAR AND GROUT 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.
  - 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. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  1. For reinforced masonry, use Type S.
- C. Pigmented Mortar: Use colored cement product.
  - 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. Mix to match Architect's sample.
- 4. Application: Use pigmented mortar for exposed mortar joints with the following units:
  - a. Decorative CMUs.
- D. 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 with the following units:
    - a. Decorative CMUs.
- E. Grout for Unit Masonry: Comply with ASTM C 476.
  - Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
  - Proportion grout in accordance with ASTM C 476, for specified 28day compressive strength indicated, but not less than 2000 psi (14 MPa)].
  - 3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.
- PART 3 EXECUTION

## 3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

## 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:
  - 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:
  - For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
  - 2. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
  - 3. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm).

# 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-thanhalf-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-thannominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

- E. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- 3.4 MORTAR BEDDING AND JOINTING
  - A. Lay CMUs as follows:
    - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
    - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
    - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
    - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
  - B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
  - C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
  - D. Cut joints flush for masonry walls to receive plaster or other directapplied finishes (other than paint) unless otherwise indicated.

## 3.5 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
  - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
  - Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

# 3.6 FLASHING, WEEP HOLES, AND CAVITY 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.

- 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.
- C. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
  - 1. Use specified weep/cavity vent products to form weep holes.
  - 2. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.
  - 3. Cover cavity side of weep holes with plastic insect screening at cavities insulated with loose-fill insulation.
- D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- E. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.
  - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.7 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  - 2. Limit height of vertical grout pours to not more than 12.67 ft.

## 3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: 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. Randomly select (2) CMU per 100 to be sent to NCMA for testing to ensure integral water repellent is present to performance required by water repellent manufacturer and NCMA TEK 19-7. If testing indicates integral water repellent is not to performance required by NCMA TEK 19-7, CMU manufacturer will remake all CMU, at their expense. CMU arrives on site and results should be acceptable before construction begins.
- C. 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.
  - Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- D. Testing Prior to Construction: One set of tests.
- E. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- G. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- H. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for compressive strength.
- I. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

# 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.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  - 3. Protect adjacent surfaces from contact with cleaner.
  - Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

## 3.10 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. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Cast-stone trim.

#### 1.2 ACTION SUBMITTALS

- Α. Product Data: For each type of product.
  - 1. For cast-stone units, include dimensions and finishes.
- в. Shop Drawings: Show fabrication and installation details for caststone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
- C. Samples:
  - 1. For each color and texture of cast stone required. 2. For colored mortar.

#### 1.3 INFORMATIONAL SUBMITTALS

- Qualification Data: For manufacturer. Α.
- Material Test Reports: For each mix required to produce cast stone, в. based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.

#### 1.4 QUALITY ASSURANCE

- Manufacturer Qualifications: A qualified manufacturer of cast-stone Α. units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute, the Architectural Precast Association or the Precast/Prestressed Concrete Institute for Group A, Category AT.
- PART 2 PRODUCTS

# 2.1 CAST-STONE UNITS

A. Manufacturer's:
- 1. Capital Cast Stone.
- 2. Edwards Cast Stone.
- 3. Midwest Cast Stone.
- B. Cast-Stone Units: Comply with ASTM C 1364.
  - 1. Units shall be manufactured using the vibrant dry tamp method.
  - Units shall be resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666/C 666M, Procedure A, as modified by ASTM C 1364.
- C. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
  - 1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
  - 2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
  - 3. Provide drips on projecting elements unless otherwise indicated.
- D. Cure Units as Follows:
  - Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F (38 deg C) for 12 hours or 70 deg F (21 deg C) for 16 hours.
  - Keep units damp and continue curing to comply with one of the following:
    - a. No fewer than five days at mean daily temperature of 70 deg F (21 deg C) or above.
    - b. No fewer than six days at mean daily temperature of 60 deg F (16 deg C) or above.
    - c. No fewer than seven days at mean daily temperature of 50 deg F (10 deg C) or above.
    - No fewer than eight days at mean daily temperature of 45 deg F (7 deg C) or above.
- E. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
- F. Colors and Textures: As selected by Architect from manufacturer's full range.

## 2.2 ACCESSORIES

- A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- B. Dowels: 1/2-inch- (12-mm-) diameter round bars, fabricated from Type 304 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.
- C. 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 cast-stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

- 1. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
  - a. <u>Diedrich Technologies</u>, Inc.; a division of Sandell Construction Solutions.
  - b. EaCo Chem, Inc.
  - c. PROSOCO, Inc.

### 2.3 MORTAR

- A. Comply with requirements in Section 042000 "Unit Masonry" for mortar mixes.
  - 1. For setting mortar, use Type N.
  - 2. For pointing mortar, use Type N.
- B. Pigmented Mortar: Use colored cement product.

### 2.4 SOURCE QUALITY CONTROL

- A. Engage a qualified independent testing agency to sample and test caststone units according to ASTM C 1364.
  - 1. Include one test for resistance to freezing and thawing.
- PART 3 EXECUTION

### 3.1 SETTING CAST STONE IN MORTAR

- A. Install cast-stone units to comply with requirements in Section 042000 "Unit Masonry."
- B. Set units in full bed of mortar with full head joints unless otherwise indicated.
  - 1. Fill dowel holes and anchor slots with mortar.
  - 2. Fill collar joints solid as units are set.
  - 3. Build concealed flashing into mortar joints as units are set.
  - 4. Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.
  - 5. Keep joints at shelf angles open to receive sealant.
- C. Rake out joints for pointing with mortar to depths of not less than 3/4 inch (19 mm). Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

- D. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch (10 mm). Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.
- E. Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.
- F. Rake out joints for pointing with sealant to depths of not less than 3/4 inch (19 mm). Scrub faces of units to remove excess mortar as joints are raked.
- G. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
  - 1. Keep joints free of mortar and other rigid materials.
  - Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."
- 3.2 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS
  - A. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
    - 1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
    - 2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.
  - B. Fill anchor holes with sealant.
    - 1. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.
  - C. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.
  - D. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."

### 3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 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.
- B. Variation from Level: Do not exceed 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.

- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches (3 mm in 900 mm) or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch (1.5 mm), except where variation is due to warpage of units within tolerances specified.

## 3.4 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
- B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean cast stone as work progresses.
  - 1. Remove mortar fins and smears before tooling joints.
  - 2. Remove excess sealant immediately, including spills, smears, and spatter.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
  - 3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
  - 5. Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 6. Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

END OF SECTION 047200

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Framing with dimension lumber.
  - 2. Wood blocking and nailers.
  - 3. 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. 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.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38mm 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: AWPA Ul; 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.
- 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 items indicated on Drawings, and the following:
  - 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, and similar concealed members in contact with masonry or concrete.

### 2.3 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade of any species.
- B. Other Framing: Construction or No. 2 grade of any 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.
  - 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.

### 2.4 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 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.

### 2.5 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fireretardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

### 2.6 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.
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

### 2.7 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt 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, 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. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWPA 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:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 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 061600 - SHEATHING

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Wall sheathing.
  - 2. Roof sheathing.
  - 3. Composite nail base insulated roof sheathing.
  - 4. Sheathing joint and penetration treatment.

## 1.2 ACTION SUBMITTALS

- Product Data: For each type of process and factory-fabricated product.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
- 1.3 INFORMATIONAL SUBMITTALS
  - A. Evaluation Reports: For the following, from ICC-ES:
    - 1. Wood-preservative-treated plywood.
- PART 2 PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA U1; Category UC2.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

### 2.3 WALL SHEATHING

- A. Plywood Sheathing: DOC PS 1, Exposure 1, Structural I sheathing.
- 2.4 ROOF SHEATHING
  - A. Plywood Sheathing: DOC PS 1, Exposure 1, Structural I sheathing.
- 2.5 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING
  - A. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C 1289, Type V with DOC PS 2, Exposure 1 oriented strand board on one face.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Atlas Roofing Corporation.
      - b. Cornell Corporation.
      - c. Dow Chemical Company (The).
      - d. Johns Manville; a Berkshire Hathaway company.
      - e. Rmax, Inc.
    - Polyisocyanurate-Foam Thickness: (2) layers of 2-1/2 inches (64 mm).
    - 3. Oriented-Strand-Board Nominal Thickness: 5/8 inch (15.9 mm).

### 2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. For roof and wall sheathing, provide fasteners of Type 304 stainless steel.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
  - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
  - 3. ICC-ES evaluation report for fastener.
- D. Coordinate wall parapet and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- 3.2 WOOD STRUCTURAL PANEL INSTALLATION
  - A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
  - B. Fastening Methods: Fasten panels as indicated below:
    - 1. Wall and Roof Sheathing:
      - a. Nail to wood framing.
      - b. Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 061600

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Wood roof trusses.
  - 2. Wood girder trusses.
  - 3. Wood truss bracing.

## 1.2 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 temporary and permanent bracing required to prevent buckling of individual truss members due to design loads.
  - 4. Indicate locations, sizes, and materials for temporary and 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.
  - 7. Show coordination with ductwork penetrations as indicated on the Drawings.
- 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 Illinois Licensed Structural Engineer responsible for their preparation.

### 1.3 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.
  - 3. Preservative wood treatment, Wood-preservative-treated lumber..

### 1.4 QUALITY ASSURANCE

- A. 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.
  - Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by an Illinois Licensed Structural Engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that complies with quality-control procedures in TPI 1 and that involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

# 1.5 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."
  - 1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
- PART 2 PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage an Illinois Licensed Structural Engineer, as defined in Section 014000 "Quality Requirements," to design metalplate-connected wood trusses.
- B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI unless more stringent requirements are specified below.
  - 1. Design Loads: As indicated on plans.
  - 2. Maximum Deflection Under Design Loads:
  - 3. Roof Trusses: Vertical deflection of 1/240 of span due to total load, and deflection of 1/360 of span due to snow load.
- A. Comply with applicable requirements and recommendations of the following publications:
  - 1. TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction."
  - 2. TPI DSB, "Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses."

- 3. TPI BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."
- B. 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 **19** percent maximum moisture content at time of dressing.
- B. Permanent Bracing: Provide wood bracing No. 2 Grade lumber.

### 2.3 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- 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 trusses unless otherwise indicated.

## 2.4 METAL CONNECTOR PLATES

- A. General: Fabricate connector plates to comply with TPI 1.
- B. 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-preservative-treated lumber and where indicated.

## 2.5 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. Provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.

## 2.6 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Allowable design loads, as published by manufacturer, shall comply with 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. 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-preservative-treated lumber and where indicated.
- C. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall top plates.

#### 2.7 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.

#### 2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20, with dry film containing a minimum of 92 percent zinc dust by weight.

## 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.
- 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.
- 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.
  - 1. Damaged trusses may be repaired according to truss repair details signed and sealed by the Illinois Licensed Structural Engineer responsible for truss design, when approved by Architect.
- 3.2 REPAIRS AND PROTECTION
  - A. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

END OF SECTION 061753

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Polyisocyanurate foam-plastic board.

## 1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Research reports.

#### PART 2 - PRODUCTS

- 2.1 POLYISOCYANURATE FOAM-PLASTIC BOARD
  - A. Polyisocyanurate Board, Foil Faced: ASTM C 1289, foil faced, Type I, Class 1 or 2.
  - B. Manufacturers: Subject to compliance with requirements:
    - 1. Atlas Roofing Corporation.
    - 2. Carlisle Coatings & Waterproofing Inc.
    - 3. Dow Chemical Company (The).
    - 4. Firestone Building Products.

## 2.2 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
  - 1. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.
- C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability

to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

- 3.1 INSTALLATION, GENERAL
  - A. Comply with insulation manufacturer's written instructions applicable to products and applications.
  - B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
  - C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
  - D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
- 3.2 INSTALLATION OF SLAB INSULATION
  - A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
    - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.
  - B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
- 3.3 INSTALLATION OF FOUNDATION WALL INSULATION
  - A. Butt panels together for tight fit.
  - B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors.
  - C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

- 3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION
  - A. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
    - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 072600 - VAPOR RETARDERS

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Polyethylene vapor retarders.
- B. Related Requirements:
  - 1. Section 033000 "Cast-in-Place Concrete" for under-slab vapor retarders.
  - 2. Section 072100 "Thermal Insulation" for vapor retarders integral with insulation products.

#### 1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- PART 2 PRODUCTS

#### 2.1 POLYETHYLENE VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, 10-mil- (0.25-mm-) thick sheet, with maximum permeance rating of 0.1 perm (5.7 ng/Pa x s x sq. m).
- PART 3 EXECUTION

#### 3.1 INSTALLATION OF VAPOR RETARDERS ON FRAMING

- A. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives, vapor retarder fasteners, or other anchorage system as recommended by manufacturer. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs and sealing with vapor-retarder tape according to

vapor-retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.

- C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

END OF SECTION 072600

SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

### PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes standing-seam metal roof panels.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: 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.
- C. Samples: For each type of metal panel indicated.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Warranties: Sample of special warranties.

## 1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

### 1.6 WARRANTY

- A. Special 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. Warranty Period: Two years 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. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

#### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.
  - 3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. 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 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

F. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

- 1. Fire/Windstorm Classification: Class 1A-90.
- 2. Hail Resistance: MH.
- G. 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.
  - 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.
- B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced 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 mechanically seaming panels together.
  - a. Berridge.
  - b. CENTRIA Architectural Systems.
  - c. Englert, Inc.
  - d. Fabral.
  - e. Peterson Aluminum Corporation.
  - f. McElroy Metal, Inc.
  - 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
    - a. Nominal Thickness: 0.028 inch (0.71 mm).
    - b. Exterior Finish: Two-coat fluoropolymer.
    - c. Color: As selected by Architect from manufacturer's full range.
  - 3. Clips: Two-piece floating to accommodate thermal movement.
    - a. Material: 0.028-inch- (0.71-mm-) nominal thickness, zinccoated (galvanized) or aluminum-zinc alloy-coated steel sheet, or thickness required to achieve roof system wind uplift rating.

- b. Material: 0.062-inch- (1.59-mm-) thick, stainless-steel sheet.
- 4. Joint Type: Double folded.
- 5. Panel Coverage: 16 inches (406 mm).
- 6. Panel Height: 2.0 inches (51 mm).

### 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils (0.76 mm) thick, 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.
  - Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
  - Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
  - 3. <u>Products</u>: Subject to compliance with requirements, provide one of the following:
    - a. <u>Carlisle Residential, a division of Carlisle Construction</u> Materials; WIP 300HT.
    - b. <u>Grace Construction Products, a unit of W. R. Grace & Co.</u>; Grace Ice and Water Shield HT.
    - c. Henry Company; Blueskin PE200 HT.
    - d. <u>Kirsch Building Products</u>, <u>LLC</u>; Sharkskin Ultra SA.
    - e. Metal-Fab Manufacturing, LLC; MetShield.
    - f. Owens Corning; WeatherLock Metal High Temperature Underlayment.
- B. Synthetic Underlayment: ASTM D 6757, D 4869; Inorganic High Strength Wove Fabric, compatible with roof panels.
  - 1. 180 day UV exposure (AC207).
  - 2. .05 perms of less (ASTM E96).
  - 3. Temp. Range: -40 degrees to 270 degrees F.
  - 4. Products: Subject to compliance with requirements, provide one of the following:
    - a. Atlas Roofing Corp. Summit.
    - b. Owens Corning Deck Defense.
- C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

## 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.
  - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- 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 and Downspouts: Formed from same material as roof panels according to SMACNA's "Architectural Sheet Metal Manual." Finish to match metal roof panels.
- E. Roof Curbs: Fabricated from same material as roof panels, 0.048-inch (1.2-mm) nominal thickness; with bottom of skirt profiled to match roof panel profiles and with welded top box and integral full-length cricket. Fabricate curb subframing of 0.060-inch- (1.52-mm-) nominal thickness, angle-, C-, or Z-shaped steel sheet. Fabricate curb and subframing to withstand indicated loads of size and height indicated. Finish roof curbs to match metal roof panels.
- F. Panel Fasteners: Self-tapping screws designed to withstand design loads.
- G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
  - Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 2. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.
  - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

## 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 UL-certified, 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. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. 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.

## 2.6 FINISHES

- A. Panels and Accessories:
  - 1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.
  - 2. Concealed Finish: White or light-colored acrylic or polyester backer finish.
- PART 3 EXECUTION

### 3.1 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.

#### 3.2 UNDERLAYMENT INSTALLATION

- A. Hi-Temp Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, 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 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.
  - 1. Apply over the roof area indicated below:

- Roof perimeter for a distance up from eaves of 36 inches (914 mm) beyond interior wall line.
- b. Valleys, from lowest point to highest point, for a distance on each side of 18 inches (460 mm). Overlap ends of sheets not less than 6 inches (152 mm).
- c. Rake edges for a distance of 18 inches (460 mm).
- d. Hips and ridges for a distance on each side of 12 inches (305 mm).
- e. Roof-to-wall intersections for a distance from wall of 18 inches (460 mm).
- f. Around dormers, chimneys, skylights, and other penetrating elements for a distance from element of 18 inches (460 mm).
- B. Synthetic Felt Underlayment: Apply at locations indicated below, in shingle fashion to shed water, and with lapped joints of not less than 2 inches (50 mm).
  - 1. Apply over the entire roof surface.
- C. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.
- D. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

#### 3.3 METAL PANEL INSTALLATION

- A. 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 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 sealant.
  - Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factoryapplied sealant are completely engaged.
  - 5. Watertight Installation:
    - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
    - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    - c. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
- B. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

C. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

#### 3.4 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.

END OF SECTION 074113.16

SECTION 074293 - SOFFIT PANELS

PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes metal soffit panels.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: 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.
- C. Samples: For each type of metal panel indicated.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Warranties: Samples of special warranties.

## 1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

### 1.5 WARRANTY

- A. Special 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. Warranty Period: Two years 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. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.
  - 3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. 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 283 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
  - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).
- D. 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.
  - Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### 2.2 METAL SOFFIT PANELS

- A. General: Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile Metal Soffit Panels Solid panels formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. PAC-CLAD Flush Soffit.
  - 2. Material: Same material, finish, and color as metal roof panels.

- 3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - a. Nominal Thickness: 0.028 inch (0.71 mm).
  - b. Exterior Finish: Two-coat fluoropolymer.
  - c. Color: As selected by Architect from manufacturer's full range.
  - d. Width: 12 inches.

### 2.3 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) aluminum-zinc-alloy 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, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
  - 1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- 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. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
  - Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/8 inch (3 mm) thick.
  - 2. Joint Sealant: ASTM C 920; as recommended in writing by metal panel manufacturer.
  - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

### 2.4 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 UL-certified, 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. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. 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.

#### 2.5 FINISHES

- A. Panels and Accessories:
  - 1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 2. Concealed Finish: White or light-colored acrylic or polyester backer finish.

## PART 3 - EXECUTION

#### 3.1 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.
  - 1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

## 3.2 METAL PANEL INSTALLATION

- A. Metal Soffit Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
  - 1. Apply panels and associated items true to line for neat and weathertight enclosure.
  - 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
  - 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
  - 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
- B. Watertight Installation:
  - 1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
  - 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
  - 3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
- C. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

### 3.3 CLEANING

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.

END OF SECTION 074293

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Formed roof-drainage sheet metal fabrications.
  - 2. Formed steep-slope roof sheet metal fabrications.
  - 3. Formed wall sheet metal fabrications.

### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For sheet metal flashing and trim.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Distinguish between shop- and field-assembled work.
  - 3. Include identification of finish for each item.
  - 4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.
- C. Samples: For each exposed product and for each color and texture specified.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Sample warranty.

## 1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

### 1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

#### 1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Finish Warranty Period: 20 years from date of Substantial Completion.
- PART 2 PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
  - 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

#### 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation,
Grade 40 (Grade 275); prepainted by coil-coating process to comply with ASTM A 755/A 755M.

- 1. Exposed Coil-Coated Finish:
  - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- 2. Color: As selected by Architect from manufacturer's full range.

#### 2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Synthetic Underlayment: Laminated or reinforced, woven polyethylene or polypropylene, synthetic roofing underlayment; bitumen free; slip resistant; suitable for high temperatures over 220 deg F (111 deg C); and complying with physical requirements of ASTM D 226/D 226M for Type I and Type II felts.
- C. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
  - Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
  - Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.
- D. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m)minimum.

# 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

- a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
- b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
- c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- 2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

# 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 1. Obtain field measurements for accurate fit before shop fabrication.
  - Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  - Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
  - 2. Use lapped expansion joints only where indicated on Drawings.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

- 2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS
  - A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
    - 1. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.
  - B. Downspouts: Fabricate open-face downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
    - 1. Hanger Style: See Drawings.
    - 2. Fabricate from the following materials:
      - a. Galvanized Steel: 0.022 inch (0.56 mm) thick.
- 2.7 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS
  - A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
    - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick.
  - B. Valley Flashing: Fabricate from the following materials:
    - 1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
  - C. Drip Edges: Fabricate from the following materials:
    - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick.
  - D. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
    - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

# 2.8 WALL SHEET METAL FABRICATIONS

A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:

 Galvanized Steel: 0.022 inch (0.56 mm) thick.

PART 3 - EXECUTION

### 3.1 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

### 3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
  - 5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
  - 1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
  - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

# 3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
  - Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
  - 2. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.

### 3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

#### 3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

## 3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077253 - SNOW GUARDS

PART 1 - GENERAL

### 1.1 SUMMARY

- A. Section Includes:
  - 1. Rail-type, seam-mounted snow guards.

# 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include roof plans showing layouts and attachment details of snow guards.
  - Include calculation of number and location of snow guards based on snow load, roof slope, roof type, components, spacings, and finish.
- C. Samples.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- PART 2 PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Provide snow guards that withstand exposure to weather and resist thermally induced movement without failure, rattling, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
  - Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Structural Performance:
  - 1. Snow Loads: As indicated on Drawings.

## 2.2 RAIL-TYPE SNOW GUARDS

A. Seam-Mounted, Rail-Type Snow Guards:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Sno Gem Sno Barricade 1 inch system with Barricade plate.
- 2. Description: Snow guard rails fabricated from metal pipes, bars, or extrusions, anchored to brackets and equipped with one rail with color-matching inserts of material and finish used for metal roofing.
- 3. Material and Finish: Aluminum; clear anodized.

# PART 3 - EXECUTION

#### 3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, snow guard attachment, and other conditions affecting performance of the Work.

#### 3.2 INSTALLATION

- A. Install snow guards according to manufacturer's written instructions. Space rows as recommended by manufacturer.
- B. Attachment for Standing-Seam Metal Roofing:
  - 1. Do not use fasteners that will penetrate metal roofing, or fastening methods that void metal roofing finish warranty.
  - 2. Seam-Mounted, Rail-Type Snow Guards: Stainless-steel clamps attached to vertical ribs of standing-seam metal roof panels.

END OF SECTION 077253

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

# 1.1 SUMMARY

- A. Section Includes:
  - 1. Nonstaining silicone joint sealants.
  - 2. Urethane joint sealants.

## 1.2 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Preconstruction laboratory test reports.
- C. Preconstruction field-adhesion-test reports.
- D. Field-adhesion-test reports.
- E. Sample warranties.

# 1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

# 1.5 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
- B. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.

#### 2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

### 2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T and NT.
- B. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade P, Class 50, Uses T and NT.

### 2.4 JOINT-SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin, Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

#### 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

# PART 3 - EXECUTION

# 3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove laitance and form-release agents from concrete.
  - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by jointsealant manufacturer or as indicated by preconstruction joint-sealantsubstrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

# 3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

- 1. Place sealants so they directly contact and fully wet joint substrates.
- 2. Completely fill recesses in each joint configuration.
- 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

### 3.3 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
  - 1. Joint Locations:
    - a. Isolation and contraction joints in cast-in-place concrete slabs.
    - b. Joints between different materials listed above.
  - 2. Joint Sealant: Urethane, M, P, 50, T, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
  - 1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Control and expansion joints in unit masonry.
    - c. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
  - 1. Joint Locations:
    - a. Isolation joints in cast-in-place concrete slabs.
    - b. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Urethane, S, P, 25, T, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
  - 1. Joint Locations:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Vertical joints on exposed surfaces of unit masonry.
    - c. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Urethane, S, NS, 25, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

## 1.1 SUMMARY

A. Section includes hollow-metal work.

#### 1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

# 1.3 ACTION SUBMITTALS

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

#### 1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

# PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. <u>Manufacturers</u>: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. <u>Ceco Door Products</u>; an Assa Abloy Group company.
  - 2. <u>Curries Company</u>; an Assa Abloy Group company.
  - 3. Republic Doors and Frames.
  - 4. <u>Security Metal Products Corp</u>.
  - 5. Steelcraft; an Ingersoll-Rand company.

- 2.2 EXTERIOR HOLLOW-METAL DOORS AND FRAMES
  - A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
    - 1. Physical Performance: Level B according to SDI A250.4.
    - 2. Doors:
      - a. Type: As indicated in the Door and Frame Schedule.
      - b. Thickness: 1-3/4 inches (44.5 mm).
      - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
      - d. Edge Construction: Model 2, Seamless.
      - e. Core: Polyurethane.
    - 3. Thermal-Rated Doors: Provide doors fabricated with thermalresistance value (R-value) of not less than 2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W) when tested according to ASTM C 1363.
    - 4. Frames:
      - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
        b. Construction: Full profile welded.
    - 5. Exposed Finish: Prime.

#### 2.3 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
  - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- H. Glazing: Section 088000 "Glazing."

I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat.

#### 2.4 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
  - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
  - 3. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:
      - 1) Two anchors per jamb up to 60 inches (1524 mm) high.
      - 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
      - 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
      - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
    - b. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
  - 4. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

- 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
- 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with mitered hairline joints.
  - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
  - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
  - 3. Provide loose stops and moldings on inside of hollow-metal work.
  - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

### 2.5 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
  - 1. Shop Primer: SDI A250.10.

#### 2.6 ACCESSORIES

- A. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.
- PART 3 EXECUTION

#### 3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
  - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - b. Install frames with removable stops located on secure side of opening.
    - c. Install door silencers in frames before grouting.
    - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.

- e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
- 2. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- 3. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
- 4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
  - 1. Non-Fire-Rated Steel Doors:
    - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
    - c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
    - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
- C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
  - Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

# 3.2 ADJUSTING AND CLEANING

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

- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible airdrying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 085200 - WOOD WINDOWS

## PART 1 - GENERAL

## 1.1 SUMMARY

A. Section includes aluminum-clad wood windows.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified.
- 1.3 INFORMATIONAL SUBMITTALS
  - A. Product test reports.
  - B. Sample warranties.

#### 1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period:
    - a. Window: 10 years from date of Substantial Completion.
    - b. Glazing Units: 20 years from date of Substantial Completion.
    - c. Aluminum-Cladding Finish: 20 years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

- 1. Window Certification: WDMA certified with label attached to each window.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
  - 1. Minimum Performance Class: CW.
  - 2. Minimum Performance Grade: 50.
- C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.27 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
- D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.27.

# 2.2 WOOD WINDOWS

- A. Aluminum-Clad Wood Windows:
  - 1. <u>Manufacturers</u>: Subject to compliance with requirements, provide products by one of the following:
    - a. <u>EAGLE Window & Door, Inc.; a subsidiary of Andersen</u> Corporation.
    - b. Hurd Windows and Doors.
    - c. <u>Marvin Windows and Doors</u>.
    - d. <u>Pella Corporation</u>.
- B. Operating Types: As indicated on Drawings.
- C. Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch (0.8 mm) deep by 2 inches (51 mm) wide; water-repellent preservative treated.
  - 1. Exterior Finish: Aluminum-clad wood.
    - a. Aluminum Finish: Manufacturer's standard fluoropolymer twocoat system with fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight and complying with AAMA 2605.
    - b. Color: As selected by Architect from manufacturer's full range.
  - 2. Interior Finish: Manufacturer's standard stain-and-varnish finish.
    - a. Color: As selected by Architect from manufacturer's full range.
- D. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
  - 1. Kind: Fully tempered.

- E. Insulating-Glass Units: ASTM E 2190.
  - 1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Clear.b. Kind: Fully tempered.

- 2. Lites: Two.
- 3. Filling: Fill space between glass lites with argon.
- 4. Low-E Coating: Pyrolytic on second surface.
- F. Hardware, General: Provide manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.
  - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- G. Projected Window Hardware:
  - 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
    - a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.
  - 2. Hinges: Manufacturer's standard type for sash weight and size indicated.
  - 3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 29 inches (735 mm) tall and two arms on taller sashes.
- H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- I. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
  - 1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

#### 2.3 INSECT SCREENS

- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
  - 1. Type and Location: Full, inside for project-out sashes.
- B. Aluminum Frames: Complying with SMA 1004 or SMA 1201.
  - 1. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.

# 2.4 FABRICATION

- A. Fabricate wood windows in sizes indicated. Include a complete system for installing and anchoring windows.
- B. Glaze wood windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.
- E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

# PART 3 - EXECUTION

# 3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- D. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
- E. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085200

SECTION 086250 - TUBULAR DAYLIGHTING DEVICE

- PART 1 GENERAL
- 1.1 SECTION INCLUDES
  - A. Tubular daylighting device.
  - B. Accessories.
- 1.2 RELATED SECTIONS
  - A. Section 076000 Flashing and Sheet Metal: Metal curb flashings.

#### 1.3 REFERENCES

- A. ASTM B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials; 2008a.
- C. ASTM A 463/A 463M Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2006.
- D. ASTM A 653/A 653M Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2007.
- E. ASTM A792/A 792M Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
- F. ASTM E 283 Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- G. ASTM E 308 Standard Practice for Computing the Colors of Objects by Using the CIE System; 2006.
- H. ASTM E 330 Structural Performance of Exterior Windows, Curtain Walls and Doors; 2002.
- I. ASTM E 547 Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain walls by Cyclic Air Pressure Difference; 2000.
- J. ASTM E 1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
- K. ASTM E 1996 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricane.
- L. ASTM D 635 Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position; 2006.
- M. ASTM D-1929 Test Method for Ignition Properties of Plastics; 1996 (2001).

- N. UL 181 Factory Made Air Ducts and Air Connectors
- 0. UL 2108 Low Voltage Lighting Systems
- P. CSA C22.2 No. 250.0 Luminaires.
- Q. ICC AC-16 Acceptance Criteria for Plastic Skylights; 2008.
- R. Florida Building Code TAS 201 Impact Test Procedures.
- S. Florida Building Code TAS 202 Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.
- T. Florida Building Code TAS 203 Criteria for Testing Products Subject to Cyclic Wind Pressure Loading
- 1.4 PERFORMANCE REQUIREMENTS
  - A. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:
    - 1. Air Infiltration Test:
      - a. Single and Dual Glazed Dome (M74 DS Type DP & DPP): Passes Air infiltration; maximum of 0.05 cfm/ft2 (0.3 L/s/m2) when tested according to AAMA/WDMA/CSA 101/I.S.2/A440-11, ICC-ES AC-16, and ASTM E 283.
      - b. Air infiltration will not exceed 0.30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
      - c. Single and Dual Glazed Dome (M74 DS Type DP & DPP): meets or exceeds the air leakage performance levels with a maximum 0.4 cfm/ft2 when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 and ASTM E 283.
      - d. Air exfiltration will not exceed 0.4 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
    - 2. Water Resistance Test:
      - a. No uncontrolled water leakage at 10.5 psf pressure differential with water rate of 5 gallons/hour/sf when tested in accordance with ASTM E 547.
    - 3. Uniform Load Test: All units tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
      - a. No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 210 psf (10.05 kPa) or Negative Load of 160 psf (7.66 kPa) in accordance with ICC AC-16 Section A.
    - 4. Fire Testing:
      - a. Fire Rated Roof Assemblies:
        - Roof Assemblies: When used with the Dome Edge Protection Band and mounted on curbs 4 inches high or greater, all domes shall meet the prescriptive fire rating requirements for Class A, B, and C roof assemblies as described in the 2012 International Building Code.
      - b. When used with the Dome Edge Protection Band, all domes

meet fire rating requirements as described in the International Building Code.

- c. Self-Ignition Temperature Greater than 650 degrees F per ASTM D-1929.
- d. Smoke Density: Rating no greater than 450 per ASTM Standard E 84 in way intended for use. Classification C.
- e. Rate of Burn and/or Extent: Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.
- f. Rate of Burn and/or Extent: Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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. Submit shop drawings showing layout, profiles and product components, including anchorage, flashings and accessories.
- D. Verification Samples: As requested by Architect.
- E. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.
- 1.6 QUALITY ASSURANCE
  - A. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 20 years.
- 1.7 DELIVERY, STORAGE, AND HANDLING
  - A. Store products in manufacturer's unopened packaging until ready for installation.
  - B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- 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 absolute limits.
- 1.9 WARRANTY
  - A. Daylighting Device: Manufacturer's standard warranty for 10 years.
- PART 2 PRODUCTS
- 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Solatube International, Inc., which is located at: Solatube International 2210 Oak Ridge Way; Vista, CA 92081-8341; Toll Free Tel: 888-765-2882; Tel: (760) 477-1120; Fax: (760) 597-4488; Email: request info (commsales@solatube.com); Web:www.solatube.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- 2.2 TUBULAR DAYLIGHTING DEVICES
  - A. Tubular Daylighting Devices General : Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICC AC-16.
  - B. Brighten Up Series: Solatube Model 160 DS, 10 Inch (250 mm) Daylighting System.
    - 1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
      - a. Outer Dome Glazing: Type DA, 0.125 inch (3 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV A), impact modified acrylic blend.
      - Raybender 3000: Variable prism optic molded into outer dome to capture low angle sunlight and limit high angle sunlight.
      - c. LightTracker Reflector: Aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in dome to capture low angle sunlight.
    - 2. Flashing Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
      - Base Material: Sheet steel, corrosion resistant, meeting ASTM A 653/A 653M or ASTM A 463/A 463M or ASTM A792/A 792M, 0.028 inch (0.7 mm) plus or minus .006 inch (.015 mm) thick.
      - Base Pitched: Pitched Type FP, 22.5 degrees slope from horizontal, 4 inches (102 mm) high.
      - c. Flashing Insulator: Type F1. Thermal isolation material for use under flashing.
      - d. Metal Roof Flashing Kit: Type MR. Includes Butyl tape, flashing screws, speed nuts, corner washers and polyurethane sealant.
    - 3. Roof Flashing Turret Extensions: Provide manufacturer's standard extensions for applications requiring:
      - a. Type T4: Additional lengths of 4 inches (100 mm) extension.
    - 4. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact acrylic; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
    - Reflective Extension Tube: Aluminum sheet, thickness 0.015 inch (0.4 mm).
      - a. Interior Finish: Spectralight Infinity with Cool Tube Technology combining ultra-high Visible Light reflectance with Ultra-low Infrared (IR) reflectance. Patented spectrally-selective optical surface yields specular

reflectance greater than 99 percent for the Visible Light spectrum (400 nm to 760 nm) and less than 20% reflectance for Infrared (IR) wavelengths longer than 980nm, resulting in a spectrally-selective Total Solar Spectrum (400 nm to 2500 nm) less than 80.2 percent.

- b. Color: a\* and b\* (defined by CIE L\*a\*b\* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ASTM E 308.
- c. Tube Diameter: Approximately 10 inches (250 mm).
- Reflective 30 degree Adjustable tube: Aluminum sheet, thickness
   .015 inch (0.4 mm).
  - a. Interior Finish: Spectralight Infinity with Cool Tube Technology combining ultra-high Visible Light reflectance with Ultra-low Infrared (IR) reflectance. Patented spectrally-selective optical surface yields specular reflectance greater than 99 percent for the Visible Light spectrum (400 nm to 760 nm) and less than 20% reflectance for Infrared (IR) wavelengths longer than 980nm, resulting in a spectrally-selective Total Solar Spectrum (400 nm to 2500 nm) less than 80.2 percent.
- Reflective 90 degree Adjustable tube: Aluminum sheet, thickness
   .018 inch (0.5 mm)
  - a. Interior Finish: Spectralight Infinity with Cool Tube Technology combining ultra-high Visible Light reflectance with Ultra-low Infrared (IR) reflectance. Patented spectrally-selective optical surface yields specular reflectance greater than 99 percent for the Visible Light spectrum (400 nm to 760 nm) and less than 20% reflectance for Infrared (IR) wavelengths longer than 980nm, resulting in a spectrally-selective Total Solar Spectrum (400 nm to 2500 nm) less than 80.2 percent.
  - b. Extension Tube Angle Adapter: Provide manufacturer's standard adaptors for applications requiring:
    - Type A1 one 0 to 90 degree extension tube angle adapter.
- Ceiling Ring: Injection molded, impact resistant acrylic. Nominal thickness is 0.110 inches (2.8 mm).
- 9. Dual Glazed Diffuser Assembly:
  - Lower glazing with integral injection molded acrylic Dress
     Ring classified as CC2 material. Nominal thickness is
     0.110 inches (2.8 mm):
    - Classic Vusion Diffuser: Molded acrylic plastic classified as CC2 material, nominal thickness 0.090 inches (2.29 mm) with injection molded acrylic Diffuser Trim Ring. Type L4.
  - b. Upper glazing: PET GAG plastic with EPDM low density sponge seal to minimize condensation and bug, dirt, and air infiltration per ASTM E283. The nominal thickness is 0.039 inches (0.99 mm).
    - 1) Natural Effect Lens: Type LN.
- 10. Accessories:
  - a. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required,
- 11. Catalog Number:S160 DS-DA-FP-T4-FI-MR-A1-E-L4-LN
- 2.3 ACCESSORIES

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.
- B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.
- C. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.
- 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. Coordinate requirements for power supply, conduit and wiring.

# 3.3 INSTALLATION

- A. Install in accordance with manufacturer's printed instructions.
- B. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.
- C. Inspect installation to verify secure and proper mounting. Test each fixture to verify operation, control functions, and performance. Correct deficiencies.

# 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

160 DS = Brighten Up Series Solatube 160 DS (10 in/250 mm Daylighting System)
Suspended/Hard Ceiling
DA = Acrylic Dome
FP = 4-inch Pitched Metal, Self Mounted
T4 = Turret Extension 4 in/100 mm
FI = Flashing Insulator
MR = Metal Roof Installation Kit

A1 = One 0-90 Degree Extension Tube (angle adaptor) E = Wire Suspension Kit (50 ft) L4 = Vusion Diffuser LN = Natural Effect Lens SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

# 1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on exterior substrates.
  - 1. Concrete.
  - 2. Concrete masonry units (CMUs).
  - 3. Steel and iron.
  - 4. Galvanized metal.
  - 5. Wood.

# 1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

# 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and each color and gloss of topcoat.

PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Behr Process Corporation.
  - 2. Benjamin Moore & Co.
  - 3. Dulux (formerly ICI Paints); a brand of AkzoNobel.
  - 4. Glidden Professional.
  - 5. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.
- 2.2 PAINT, GENERAL
  - A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
  - B. Material Compatibility:
    - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
    - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
  - C. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

# 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Masonry (Clay and CMUs): 12 percent.
  - 3. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

# 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

#### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### 3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

#### 3.5 EXTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Traffic Surfaces:
  - 1. Clear Water-Based Sealer System:
    - a. Prime Coat: Sealer, water based, matching topcoat.
    - b. Intermediate Coat: Sealer, water based, matching topcoat.
    - c. Topcoat: Sealer, water based, for concrete floors, MPI #99.
  - 2. Clear Sealer System:

- a. Prime Coat: Sealer, solvent based, matching topcoat.
- b. Intermediate Coat: Sealer, solvent based, matching topcoat.
- c. Topcoat: Sealer, solvent based, for concrete floors, MPI #104.

# B. CMU Substrates:

- High-Build Latex System: Dry film thickness of not less than 10 mils (0.25 mm).
  - a. Prime Coat: As recommended in writing by topcoat manufacturer.
  - b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
  - c. Topcoat: Latex, exterior, high build, MPI #40.
- C. Steel and Iron Substrates:
  - 1. Water-Based Light Industrial Coating System:
    - a. Prime Coat: Primer, rust inhibitive, water based MPI #107.
    - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    - c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5), MPI #163.
- D. Galvanized-Metal Substrates:
  - 1. Water-Based Light Industrial Coating System:
    - a. Prime Coat: Primer, galvanized, water based, MPI #134.
    - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
    - c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5, MPI #16.
- E. Wood Substrates: Doors.
  - 1. Latex over Latex Primer System:
    - Base Coat: Stain, exterior solvent based, semi-transparent, MPI #13.
    - b. Intermediate Coat: Varnish with UV inhibitor, exterior, semigloss, MPI #30. Gloss Level 5.
    - c. Topcoat: Varnish with UV inhibitor, exterior, semi-gloss, MPI
      #30. Gloss Level 5.
- F. Plastic Trim Fabrication Substrates:
  - 1. Latex System:
    - a. Prime Coat: Primer, bonding, water based, MPI #17.

- b. Intermediate Coat: Latex, exterior, matching topcoat.
- c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates.
  - 1. Concrete.
  - 2. Concrete masonry units (CMUs).
  - 3. Steel and iron.
  - 4. Galvanized metal.
  - 5. Plastic.

### 1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

# 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.
PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. <u>Manufacturers:</u> Subject to compliance with requirements, provide products by one of the following:
  - 1. <u>Benjamin Moore & Co</u>.
  - 2. <u>Glidden Professional</u>.
  - 3. PPG Architectural Finishes, Inc.
  - 4. <u>Sherwin-Williams Company (The)</u>.
- B. Products: Subject to compliance with requirements, provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

## 2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.
- PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Masonry (Clay and CMUs): 12 percent.
  - 3. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

#### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

#### 3.4 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Traffic Surfaces:
  - 1. Water-Based Concrete Floor Sealer System:
    - a. First Coat: Sealer, water based, for concrete floors, matching topcoat.
    - b. Topcoat: Sealer, water based, for concrete floors, MPI #99.
    - c. Coordinate with integral vapor barrier in concrete.
  - 2. Solvent-Based Concrete Floor Sealer System:
    - a. First Coat: Sealer, solvent based, for concrete floors, matching topcoat.
    - b. Topcoat: Sealer, solvent based, for concrete floors, MPI #104.
    - c. Coordinate with integral vapor barrier in concrete.
- B. CMU Substrates:
  - 1. Clear sealer water repellent system:

- a. Base Coat: TK-TR1-Siloxane 290.
- b. Intermediate Coat: TK-TR1-Siloxane 290.
- c. Topcoat: TK-Bright Kure and Seal.
- C. Steel Substrates:
  - 1. High-Performance Architectural Latex System:
    - a. Prime Coat: Primer, alkyd, anti-corrosive, for metal, MPI #79.
    - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
    - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
- D. Galvanized-Metal Substrates:
  - 1. High-Performance Architectural Latex System:
    - a. Prime Coat: Primer, galvanized, water based, MPI #134.
    - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
    - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.
- E. Plastic Substrates:
  - 1. High-Performance Architectural Latex System:
    - a. Prime Coat: Primer, bonding, solvent based, MPI #69.
    - b. Intermediate Coat: Latex, interior, high performance architectural, matching topcoat.
    - c. Topcoat: Latex, interior, high performance architectural, semi-gloss (MPI Gloss Level 5), MPI #141.

SECTION 220529 - SUPPORTS AND ANCHORS FOR PLUMBING

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. Supports for plumbing pipe.
      - b. Sleeves and seals for plumbing piping.
      - c. Escutcheons on plumbing piping.
      - d. Flashing for vent piping.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 220700 Plumbing Insulation.
    - 2. 221100 Domestic Water Piping.
    - 3. 221119 Domestic Water Piping Specialties.
    - 4. 221300 Sanitary Piping.
    - 5. 221319 Sanitary Waste Pipe Specialties.
- 1.03 SYSTEM DESCRIPTION
  - A. Definitions:1. Plumbing piping includes domestic cold and non-potable water piping, waste and vent piping.

### 1.04 REFERENCES

- A. AISC American Institute of Steel Construction.
- B. ASME B31.9 Building Services Piping
- C. ASTM F708 Design and Installation of Rigid Pipe Hangers.
- 1.05 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Product Data: Provide manufacturers catalog data including load capacity. Submit pipe supports not listed in this specification.
- 1.06 REGULATORY REQUIREMENTS
  - A. Conform to Illinois Plumbing Code for support of plumbing piping.

### 1.07 COORDINATION

- A. Sleeves:
  - 1. Coordinate placement with masonry and concrete trades.
  - 2. Sleeves installed after wall and floor construction are acceptable per this specification.
- B. Insulation:
  - 1. It is not acceptable for piping with cold surfaces not to be insulated through hangers. Provide hangers specified for insulation to be large enough to pass insulation through or to have built in layers of insulating material that can be sealed to.
- PART 2 PRODUCTS

## 2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

#### 2.02 PIPE HANGERS AND SUPPORTS

- A. Acceptable Manufacturers.
  - 1. B-Line.
  - 2. Grip Strut.
  - 3. Fee and Mason.
  - 4. Grinnel.
  - 5. Unistrut.
- B. Hanger Description:
  - Side mounted brackets for attachment to wood joist shall be bolt through steel angle or malleable iron bracket equal to B-Line B-3060 or B-3062.
  - 2. At Contractors option, attachment to wood joist shall be 1/4" to 3/8" lag screws with connection for 3/8" hanger rod from side of inline.
  - 3. Strut supports shall be galvanized 14 or 12 gauge rolled carbon steel with galvanized die-formed accessory clamps and fasteners.
  - 4. "J-Hooks" for 2" pipe and smaller shall be 1/4" thick by 1-1/4" wide steel rated for 200 lbs each.
  - 5. Hold down straps shall be die-stamped of galvanized sheet steel or formed of galvanized malleable iron.
- C. Plumbing Piping:
  - 1. Conform to ASME B31.9 ASTM F708 and Illinois Plumbing Code.
  - Hangers for Pipe Sizes 1-1/2" and Over: Carbon steel, adjustable, clevis.
  - 3. Vertical Support: Steel riser clamp or steel strut with accessory clips and neoprene inserts.
  - Hangers for Pipe Sizes 1/2" to 1-1/2", copper plated, adjustable swivel.
  - 5. Wall Supports for Horizontal Pipe: "J-Hooks" or struts, see drawing.
  - 6. Neoprene inserts for insulated pipe shall be full depth of insulation specified.

#### 2.03 ACCESSORIES

- A. Hanger Rods: Mild steel continuous threaded.
- B. Auxiliary Steel and Trapeze Hangers.
  - 1. Manufactured struts shall be rolled of 12, 14, or 16 gauge material to meet loading required or as noted on Drawings or otherwise specified. It shall have a hot dipped galvanized coating.
- C. Acceptable Products.
  - 1. B-Line.
  - 2. Uni-strut.
  - 3. Grip Strut.
- 2.04 ANCHORS

- A. Masonry or concrete type for pipe or equipment supports. Shall be wedge type with either studs or National coarse female thread. Alternative type shall be self drilling expansion type. Anchors shall be U. L. listed.
- B. Masonry or concrete type for securing escutcheons to masonry shall be "nail-in" type. Unit shall consist of broad head on hollow zinc alloy core with steel drive pin. Provide with dielectric washer.
- 2.05 FLASHING
  - A. Vent flashing for preformed steel roofs shall be approved by the roofing manufacturer for their system.
  - B. Roof flashings shall be 24 gauge galvanized steel sheet of 18" x 18" size with a flexible "rubber" sealing collar which is mated to the metal. It shall be rated for 180 degrees F continuous temperatures.
- 2.06 SLEEVES
  - A. Sleeves for Pipes Through Walls Schedule 40 PVC.
  - B. Sleeves for pipes through exterior masonry walls. Schedule 40 solid PVC.
- 2.08 SEALANTS
  - A. Exterior and interior moisture sealant Shall be non-hardening silicone type rated for temperatures of -40 degrees F to 250 degrees F. Material shall be available in white, gray, brown, and black colors. Material shall be sunlight resistant.
  - B. Manufacturer

		Exterior
		Sealant
1.	Tremco S	pectrum 2
2.	3M	2000
		150
3.	General Electric	SCS1000
4.	Dow Corning	999A

# 2.09 ESCUTCHEONS

- A. For piping Shall be chrome finished split faced plastic.
- B. Where holes are over large or offset.
  - 1. Utilize pre-painted aluminum sheet fabricated to cover entire hole and seal within 1/4" of the pipe or pipe covering.
  - 2. Holes shall be hole sawed or punched. Holes shall be round.
- PART 3 EXECUTION
- 3.01 APPLICATION
  - A. Plumbing Pipe:
    - 1. Shall be supported in accord to the Illinois Plumbing Code and this specification.
    - 2. Plastic pipe 2" and less shall be supported on 5'-0" centers.
    - 3. Copper tube 1" and smaller shall be supported independent of fixtures and at a maximum of 5'-0" centers.
    - 4. Cold water pipes shall be supported with swivel type hangers. Provide insulation shields where pipe is insulated.
    - 5. Where cold water pipe passes through strut clamps. Provide neoprene inserts or oversized pipe sleeves that pass insulation continuously.

B. Hanger Rod:
1. Hanger rod size shall be: 3/8" for pipe up to 2" in size and loads up to 360 lbs.

#### 3.02 PREPARATION

- A. Coordination of Trades/Owner:
  - 1. Work with cement finisher and finish floor installer to be sure concrete substrate is acceptable for installation of waterers.
  - 2. Locate sleeves in conjunction with concrete and masonry trades. Determine exact elevation and lateral position.
  - 4. At Contractor's option core drill openings in walls.

## 3.03 ANCHORS

- A. Use anchors in concrete or masonry walls and floors.
- B. Drill hole clean of loose material. Install anchor, flush with surface. Size hole in accord to manufacturers' recommendation. Physically test anchor by pulling against it. Loose anchors will not be accepted.
- 3.04 PIPE HANGERS AND SUPPORTS
  - A. Utilize hangers in accord to Application paragraphs.
  - B. Install hangers to provide minimum 1/2" space between finished covering and adjacent work.
  - C. Place hangers within 12" of each horizontal elbow.
  - D. Use hangers with 1-1/2" minimum vertical adjustment.
  - E. Support vertical piping such that it cannot be deflected more than 1/8" from center by hand pressure.
  - F. Support riser piping independently of connected horizontal piping.
  - G. Provide copper plated hangers and supports for copper piping. Provide hard neoprene inserts secured with strut. Insert shall completely cover pipe and match insulation thickness as closely as manufactured standards allow.
  - H. Locate hangers for pipe movement without disengagement of supported pipe.
  - I. Provide auxiliary steel to span structure where required. Provide in accord to Paragraph 3.06 below.
  - J. Secure upper attachment from the top chord of wood joists.
  - K. Paint cut surfaces of galvanized steel strut with cold galvanizing.

# 3.05 SLEEVES, SEALS & ESCUTCHEONS

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Place sleeves in forms at location desired. Locate wall sleeves exactly as desired. Openings installed in constructed walls shall be core drilled. Extend sleeves through floors one inch above finished floor level. Caulk sleeves.

- C. Exterior wall penetrations shall be sealed with colored silicone between pipe and sleeve. Pack interior of sleeve with fiberglass batt.
- D. Provide escutcheon on exposed interior penetrations. Secure escutcheons into place with bead of sealant under. Wipe away exposed sealant.
- E. Sleeves passing through slab on grade construction shall be terminated a 2" above floor level. Mortar and seal into core drilled openings.

## 3.06 AUXILIARY STEEL

- A. Hanging Equipment and Materials:
  - 1. Shall be supported from the top or upper side of wood joists.
  - Auxiliary steel shall be manufactured strut. Strut shall be sized in accord to the manufacturer's literature unless shown otherwise on Drawings.
- B. Paint cut edges of strut supports with cold galvanizing.

# 3.07 FLASHING

- A. Coordinate with General Trades be certain membranes which are installed by General Trade are secured in membrane flange.
- B. Install roof flashing before roof is installed. Secure with nails at corners and 1/2 points on top and sides. Seal in accord with roof manufacturer. Secure neoprene boot to pipe with stainless steel band clamp. Apply a bead of exterior sealant around juncture.

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPE AND EQUIPMENT

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:
    1. Contractor Provide:
    a. Pipe stencils and labels.
    b. Valve tags.
- 1.02 RELATED WORK
  - A. Specified Elsewhere.
    1. 220700 Plumbing Insulation.
    2. 221100 Domestic Water Piping.
    3. 221300 Sanitary Piping.
- 1.03 REFERENCES
  - A. ANSI B13.1 Scheme for the Identification of Piping Systems.
- 1.04 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Submit list of wording, symbols, letter size, and color coding for mechanical identification.
  - C. Product Data: Provide manufacturers catalog literature for each product required.
  - D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 STENCILS
  - A. Stencils: With clean cut symbols and letters of following size:
    1. 3/4" to 2" Outside Diameter of Insulation or Pipe: 8" long color field, 1/2" high letters.
  - B. Stencil Paint: (Shall be latex enamel colors conforming to application noted below.)
- 2.03 PIPE LABELS
  - A. Shall have flexible PVC or vinyl backer at either snaps over pipe or is strap-on with draw ties, or glues to itself.

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- B. Background shall be yellow.
- C. Letters shall be nominally 1/2" for pipe up to 1" and 3/4" for outside diameters up to 2-3/8".
- D. Acceptable Manufacturers:

  - Brady Bradysnap/strap-on.
     EMED Kwik Coil/wrap-around.
  - 3. Seton Setmark/markers-on-a-roll.
- 2.05 VALVE LABELS
  - Shall be white nylon, metal, or vinyl "write-on" type with draw band attachment Α. in 2" x 3" to 3" x 5" size.
  - B. Label shall identify waterer valve serves. I.E., "Middle Stall"; "North Stall" and 'West Outside"; main water shut-off. Lettering shall be typed or neatly lettered manually with an indelible black pen. Numbered tags and framed schedule are absolutely not wanted and will not be accepted as a substitute for specified tags.
  - Acceptable Products: С.
    - 1. Emedco Jumbo Tag Seal

    - Brady 65000 Series
       Seton Write on Tag
- 2.06 BURIED PIPE RIBBON
  - Warning ribbons shall be 6" wide x3.5 mil polyethylene in APWA color. Α.
  - Acceptable Products: в.
    - 1. Brady Identoline.
    - 2. Emed Underground Warning Tape.
    - 3. Seton Underground Warning Tape.
- PART 3 EXECUTION
- 3.01 PREPARATION
  - Sand or steel wool pipe smooth removing factory applied lacquer coatings. Α. Wipe free of dust.
  - в. Painted, paper or rubber surfaces shall be wiped clean. Use solvent as recommended by insulation manufacturer where it applies.
- 3.02 INSTALLATION
  - Identify valves in corridor. Α.
  - Identify piping, concealed or exposed, with pipe labels. Use names shown D. on Drawings. Install in clear view and align with axis of piping. Locate identification on each side of wall penetrations and near each equipment take off. Locate on minimum of 50'-0" centers on straight runs without branches and take-offs.

#### SECTION 220700 - PLUMBING INSULATION

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:1. Contractor Provide:a. Insulation of domestic and non-potable water piping.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 225290 Supports and Anchors for Plumbing.
    - 2. 220553 Identification for Plumbing Piping and Equipment
    - 3. 221100 Domestic Water Piping.

#### 1.03 SYSTEM DESCRIPTION

- A. Definitions:
  - 1. Domestic water piping includes cold potable water piping.
  - 2. Non-potable water pipe includes cold water pipe down stream of a back flow prevention device.
- 1.04 QUALITY ASSURANCE
  - A. Material shall have UL listings stamped on material or packing containers.
  - B. Inspect finished insulation to assure specified tolerance is met. A/E will verify. If A/E notes tolerances are exceeded, entire system shall be re-inspected and corrections made.
- 1.05 REGULATORY REQUIREMENTS
  - A. ASTM C177 Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
  - B. ASTM C534 Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
  - C. ASTM D1667 Flexible Cellular Materials Vinyl Chloride Polymers and Copolymers (Closed Cell Foam).
  - D. ASTM E84 Surface Burning Characteristics of Building Materials.
  - E. ASTM E96 Water Vapor Transmission of Materials.
  - F. ASHRAE 90-1-2007 Energy Efficient Design of New Buildings Except Low Rise Residential Buildings.
  - G. International Energy Conservation Code 2012.

#### 1.06 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Provide product description, list of materials and thickness for each service, and locations. Show compliance with all specified standards. Show K-Value, maximum temperature, permeability, surface burning characteristics, flame spread and smoke density. Provide MSDS sheets for adhesives and paints. Show material is asbestos free. Submit product data for covers and accessories.

- C. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.
- Provide name of insulating contractor and value of insulation work on D. Contractors Schedule of Values.

#### 1.07 QUALIFICATIONS

- A. Installer: Workman skilled in performing the work of this section.
- 1.08 DELIVERY, STORAGE, AND HANDLING
  - A. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density fire ratings and thickness. Keep separated.
  - B. Store insulation in original wrapping and protect from weather and construction traffic.
  - Protect insulation against dirt, water, chemical, and mechanical damage. C.
- 1.09 ENVIRONMENTAL REQUIREMENTS
  - Α. Maintain ambient temperatures and conditions required by manufacturers of adhesives, and insulation cements.
  - Maintain temperature during and after installation for minimum period of Β. 24 hours.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 CELLULAR FOAM
  - Insulation: ASTM C534; flexible, cellular elastomeric, molded tube: Α.
    - 1. K Value: ASTM C177 .28 at 75 degrees F.
    - 2. Minimum Service Temperature: 40 degrees F.

    - Maximum Service Temperature: 220 degrees F.
       Maximum Moisture Absorption: ASTM D1056; 3.0 percent pipe by volume, 6.0 percent sheet by volume.
    - Moisture Vapor Transmission: ASTM E96; 0.20 perm inches. 5.
    - Maximum Flame Spread: ASTM E84; 25. 6.
    - 7. Maximum Smoke Developed: ASTM E84;50.
    - Connection: Waterproof vapor barrier adhesive. 8.
  - Β. Acceptable Products:
    - 1. Armstrong AP Armaflex.
    - 2. Schuller Rubatex.
    - 3. Hallstead Mitchell Insul-Tube.

PART 3 - EXECUTION

- 3.01 ENVIRONMENTAL CONDITIONS
  - A. Work shall be done when temperatures are within the limits set by the manufacturer.
  - B. Outdoor work shall not be done during any form of precipitation.
- 3.02 PREPARATION
  - A. Verify that piping has been tested before applying insulation materials.
  - B. Verify that surfaces are clean, foreign material removed, and dry.

#### 3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. On exposed piping, locate insulation and cover seams in least visible locations.
- C. Insulated cold pipes conveying fluids below ambient temperature: (cold water).
  - 1. Maintain vapor barrier, align insulation and seal without gaps.
  - 2. Insulate fittings, joints, and valves with insulation of like
  - material and thickness as adjacent pipe. Miter angles.
  - 3. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
  - 4. Insulate entire system including fittings, and valves.
  - 5. Seal inserts at strut supports to adjacent insulation.
- D. Provide galvanized shields at all pipe hangers.
- E. Finish insulation at supports, protrusions, and interruptions.
- F. All joints shall be made with adhesive. Raw edges shall not be exposed except for overlaps. Do not use duct or electricians tape on closed cell foam insulation.
- 3.04 APPLICATION

	PIPING SYSTEMS	INSULATION	PIPE SIZE	THICKNESS Inch
		TYPE Inch		
Α.	Domestic Cold Water Pipe	Cellular Foam	4″ and less	1/2"
	and Non-potable Water			

- 3.05 FIELD QUALITY CONTROL
  - A. No gaps will be allowed in cold pipe insulation.

# SECTION 221100 - WATER PIPING

## PART 1 - GENERAL

- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. New domestic water service.
      - b. New domestic water pipe and non-potable water pipe.
      - c. Exploration work to locate existing underground water mains including depth and horizontal location.
      - d. All cutting and patching of existing concrete slabs to access existing piping.
  - B. Unit cost:
    - 1. Contractor Provide:
      - a. A cost per linear foot of service length that can be used to adjust the base bid cost in case a metered live water main is encountered within the excavation.

## 1.02 DESCRIPTION

#### A. Definitions

- 1. Domestic Water Includes cold water return.
- 2. Plumbing Contractor = Plumbing Subcontractor or Plumbing Trade.
- 3. Domestic water mains is that piping used in building to convey water to points of use.
- 4. Domestic water branch pipe is that pipe used in rooms with fixtures.
- 5. Service Piping Includes underground pipe located between buildings.
- B. Description:
  - 1. Base bid domestic water piping shall include:
    - a. Water is known to exist at the existing hydrant which serves the Muntjac Facility. Excavation shall be routed from the Takin Facility to the Muntjac or Australian Facility. This is to potentially shorten the route.

# 1.03 RELATED WORK

- A. Specified Elsewhere:
  - 1. 220529 Supports and Anchors for Plumbing.
  - 2. 220553 Identification for Plumbing Piping and Equipment.
  - 3. 220700 Plumbing Insulation.
  - 4. 221110 Domestic Water Piping Specialties.

#### 1.04 REFERENCES

- A. ANSI B31.9 Building Service Piping.
- B. ASME B16.22 Wrought Copper and Bronze Solder-Joint Pressure Fittings
- C. ASTM A53 Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- D. ASTM A120 Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses.
- E. ASTM B32-92 Solder Metal.
- F. ASTM B88 Seamless Copper Water Tube.

- G. ASTM F876-93 Standard Specification for Crosslinked Polyethylene (PEX) tubing.
- H. ASTM D-2666 Polybutylene water service cold water pipe and tubing.

### 1.05 SUBMITTALS

- A. Submit under provisions Section 013300.
- B. Product Data: Provide data on valves and piping accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Tests:
  - 1. Provide a witnessed pressure test of water piping. Test as required by the Illinois Plumbing Code.
- D. Schedule of Values:
  - 1. Provide a separate dollar value of all water piping work used on this job as part of the Schedule of Values.
  - 2. Provide a separate cost for the underground service pipe from Muntjac hydrant to the Takin building.

#### 1.06 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 017839.
- B. Record actual locations of valves. Record lateral and vertical locations of underfloor and underground pipe. Locate in relation to walls and surfaces which extend beyond concealing surfaces.
- C. Obtain A/E review of record documents before or at each pay progress meeting.
- 1.07 QUALITY ASSURANCE
  - A. Valves: Manufacturer's name and pressure rating marked on valve body.
- 1.08 REGULATORY REQUIREMENTS
  - A. Completed work shall be in accordance with State of Illinois Plumbing Code.
- 1.09 DELIVERY, STORAGE, AND HANDLING
  - A. Deliver, store, protect and handle products to site under provisions of Section 016000.
  - B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
  - C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
  - D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.
- 1.10 ENVIRONMENTAL REQUIREMENTS
  - A. Do not install underground piping when bedding are wet or frozen.

## PART 2 - PRODUCTS

- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 WATER PIPING (WATER SERVICE)
  - A. Polyethylene Tubing: Shall be copper tube size rated for 200 psi. Tubing shall be SDR 9 and shall meet requirements for ASTM D-2737 and national Sanitation Foundation requirements for potable water. Fittings shall be compressions type with stiffener inserts.
- 2.03 WATER PIPING, INSIDE BUILDING
  - A. Copper Tubing: ASTM B88, Type L, hard drawn.
    - 1. Fittings: ASME B16.18, cast bronze, or ASME B16.22, wrought copper and bronze.
    - 2. Joints: ASTM B32-92, solder, lead-free and antimony-free.
    - 3. Acceptable Products:
      - <u>Solder</u> Tarament Sterling.
      - a. Taracorp Tarament Sterl b. Oatey Silver.
    - 4. At Contractor's option fittings shall be wrought copper press connected type with EPDM "O"-Ring type gaskets. Fittings shall have indicators that verify connections have been made.
    - 5. Acceptable Products:
      - a. Viega ProPress.
  - B. Under Floor non potable water inside and outside of building shall be cross linked polyethylene which complies with ASTM F876. It shall be rated for pressures of 160 PSI at 73.4 degrees F and 100 PSI at 180 degrees F. Exterior of the tubing shall be purple or contain a purple strip. Fittings shall be manufactured specifically for the tubing and shall use crimp style connections. Inserts shall not reduce interior size when correctly installed.
  - C. Acceptable Manufacturers:
    - 1. Cresline
    - 2. Vanguard
    - 3. Viega
    - 4. Zurn
- 2.04 FLANGES, UNIONS, AND COUPLINGS
  - A. Pipe Size 2" and Under:
    - 1. Ferrous pipe: 150 psig malleable iron threaded unions.
    - 2. Copper tube and pipe: 150 psig bronze unions with soldered joints.
  - B. Dielectric Connections: Brass flange with copper solder end, gaskets, dielectric flange bolt inserts, washers and stainless steel bolts.
- 2.05 VALVES

A. Ball Valves up to and including 3": Bronze 600# wog, 150# swp two piece body, stainless steel or chrome plated full port bronze ball, teflon seats and stuffing box ring, lever handle, solder or threaded ends.

D-11

B. Acceptable Products:

		Dall
1.	Apollo	Model 77 Series
2.	Watts	Model 6800 Series
3.	Milwaukee	Model BA 400 Series

#### 2.06 WATER SERVICE DEVICES

- A. General Requirements
  - 1. All devices shall be rated for use with potable water at pressures of 150 psig.
  - 2. All devices shall meet standards of the National Sanitation Foundation (NSF) and the American Water Works Association (AWWA).
- B. Corporation stops shall have bronze bodies with tapered bronze male inlet 1/4 turn tapered plug valve and compression outlet. Operator shall be a rectangular head.
- C. Tapping saddle shall be sized for main pipe and consist of two brass bands hinged to a cast bronze saddle with stainless steel or brass adjustment screws. Casting shall be tapped for corporation stop.
- D. Corporation stop and saddle shall be capable of accepting wet tap drill rig.
- E. Curb stop shall have bronze body tapered 1/4 turn plug and compression ends for CTS tubing. Operator shall be rectangular or square.
- F. Valve box shall be three piece type which utilizes 1-1/4" pipe to accommodate bury depth. Extension pipe shall be schedule 40 galvanized steel. Top shall have holes for spanner wrench operation; it shall be cast iron with bronze threaded insert. Lower element shall be bell shaped with cut out to accommodate curb stop. Furnish with 6'-0" combination fee handle to fit valve operator and spanner holes.
- G. Tapping arrangement for existing pipe 1-1/2" and smaller shall include a compression adaptor couplings and appropriate schedule 80 PVC copper or polypropylene "tee" fittings which can mate with (E) pipe.

## PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine areas and conditions under which plumbing piping is to be installed.
- B. Verify excavations are free of debris or stones.
- C. Verify that excavations are to required grade, dry, and not overexcavated.
- D. Verify existing piping at new connection points is in sound condition.
- E. Verify placement of fixtures and equipment to determine locations of rough-in connections.

F. Correct any unsatisfactory conditions before beginning installing piping products of this section. Commencement of installation indicated acceptance of conditions.

#### 3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel PVC pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Valves:
  - 1. Remove shipping materials.
  - 2. Examine valve (interior and exterior) to verify that valve is clean and corrosion free.
  - 3. Verify that valves operable through full open and close positions.

#### 3.03 DEMOLITION

- A. Removal for reuse.
  - 1. Disconnect existing piping where new piping is shown for reconnection carefully by dis-assembling joints or by squarely cutting, for rethreading, soldering or otherwise connecting.
- B. Pavement Cutting:
  - 1. Existing concrete pavement shall be saw cut at least 2 inches through before concrete material is broken up and removed.
  - 2. Minimize extent of removal work; however, provide sufficient removal to access piping.
- 3.04 EXCAVATION, BEDDING AND BACKFILL
  - A. Excavate existing fill and material to locate existing piping and to install new. Granular materials shall be saved for reuse providing it is not polluted with mud or building debris.
  - B. Install new underfloor and underground piping on compacted granular cradle bedding. Install at least 3 inches of bedding above top of pipe. Use clean p-gravel or sand as bedding.
  - C. Remaining backfill shall be what was removed from excavation less debris or shall be bedding material.

## 3.05 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient.
- D. Install piping to conserve building space and not interfere with use of space. Install pipe parallel or at right angles to building walls. Diagonal runs shall be as shown on drawings.
- E. Group piping whenever practical at common elevations.

- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Install fittings at changes in direction. Install swing joints at branch connections to mains.
- G. Connecting components of unequal size: Install standard reducers or increasers, correctly sized for application indicated.
- H. Clearances:
  - 1. Provide adequate space around piping to allow proper application of insulation.
  - 2. Finished piping insulation minimum clearance: 1", all around.
- I. Support and anchor pipe as specified in Section 220529.
- J. Joints:

## 1. Copper Pipe:

- a. Press Fittings:
  - 1) Shall be made in accord with fitting manufacturer's
  - instruction using tools recommended by that manufacturer. Sweat Fittings:
  - 1) Solder shall be full depth of fitting socket.
  - 2) Joints shall be "wiped" and form a neat fillet.
- 2. PEX Pipe:

b.

- a. Press Fittings:
  - 1) Shall be made in accord with fitting manufacturer's

instruction using tools recommended by that manufacturer.

- K. Domestic Water Piping System:
  - 1. Install on interior side of building insulation.
  - 2. Pitch: 1/32"-per-foot or greater to drain point. Do not trap.
    - Provide valves at drain point.
  - 3. General-purpose valves:
    - a. Install valves with stems horizontal or above horizontal. Do not install inverted.
    - b. Position valves to allow easy access. Provide additional support where required.
    - c. Provide valves as shut offs as indicated.
    - d. Allow clearance for insulation at handles.
  - 4. Connections:
    - a. Connect waterers as detailed.
  - 5. Install underground piping as single continuous piece within PVC sleeve with long sweep 90 degrees els to above the floor. Install without kinking.
- L. Underground Water Service Pipes 2" and Smaller:
  - 1. Use polyethylene service pipe specified.
  - 3. Make connection at existing mains with tapping tee and a corporation stop specified. Make live tap through corporation stop or break existing pipe and insert appropriate Tee and compression fittings.
  - 4. Extend service to stop valve location where shown on drawing. Set stop valve on accessory valve box foot. Field adjust valve box height to match grade.
  - 5. Extend polyethylene service into the building through a PVC sleeve mortared into a core drilled opening.
  - Provide a compression connection and NPT brass elbow adaptor at the wall. Install a full port ball valve immediately inside the building.
  - 7. Fill annular area between the sleeve and the service pipe with expandable polyurethane foam the full depth of the sleeve.
- 3.06 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections. Use in accessible locations only.
- B. Install values for shut-off to isolate equipment and in vertical risers. See drawings for other locations.
- C. Application Chart:

Use	Description	Pipe Type	Fitting Type
1.	Underground Domestic Water Service	200 psi Polyethylene	Compression Connectors
2		a	

- 3. Domestic Water Pipe Copper Sweat Solder (Above ground)
- 4. Underfloor Non Potable Purple PEX Compressions Water
- 3.07 ERECTION TOLERANCES
  - A. Slope water piping and arrange to drain at low points.
- 3.08 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM.
  - A. Flush with fresh chlorinated water.

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Plumbing Contractor Provide:
      - a. Hydrants.
      - b. Backflow preventer.
      - c. Waterers.
      - d. Commission of backflow preventers.
- 1.02 DESCRIPTION
  - A. Definitions: 1. Plumbing Contractor = Plumbing Subcontractor for this work.
- 1.03 RELATED WORK
  - E. Specified Elsewhere: 1. 221100 - Water Piping.
- 1.04 REFERENCES
  - A. ANSI/ASSE 1019 Wall Hydrants, Frost Proof Automatic Draining Anti-Backflow Types.
  - B. AWWA C506 Backflow Prevention Devices Reduced Pressure Principle and Double Check Valve Types.
- 1.05 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
  - C. Manufacturer's Installation Instructions: Indicate assembly and support requirements.
  - D. Test Certificate for back flow preventers.
  - E. Submit line item price for hydrants, waterers and back flow preventer on Schedule of Values. Identify supplier vendor.
- 1.06 PROJECT RECORD DOCUMENTS
  - A. Submit under provisions of Section 017839.
  - B. Record actual locations of equipment, backflow preventers, and water hammer arrestors.
- 1.07 OPERATION AND MAINTENANCE DATA
  - A. Submit under provisions of Section 017823.

- Maintenance Data: Include installation instructions, spare parts lists, B exploded assembly views.
- 1.08 DELIVERY, STORAGE, AND HANDLING
  - Deliver, store, protect and handle products to site under provisions of Α. Section 016000.
  - в. Accept specialties on site in original factory packaging. Inspect for damage.
- 1.09 EXTRA MATERIALS
  - A. Furnish under provisions of Section 017700.
  - B. Provide two loose keys for each hydrant.
- 1.10 COORDINATION
  - With other trades: Α. 2. Deliver hydrants to masons for inclusion in walls. Establish the required height.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 HYDRANTS
  - A. Acceptable Products:

		Exposed
1.	Woodford	65 Series
2.	Zurn	Z1300

- в. Exposed Wall Hydrant: ANSI/ASSE 1019; non-freeze, self-draining surface mounted type with rough bronze finish, removable wheel handle or loose key lockshield and integral vacuum breaker with hose thread spout.
- 2.03 BACKFLOW PREVENTERS
  - Double check. Α.
    - 1. Configuration shall be top entry with two mechanically independent spring loaded poppet style check valves set in a single or double body.
    - Unit shall include full port ball valves, test cocks and strainer. 2.
    - 3. Shall meet ANSI/ASSE 1015-1988.
  - E. Manufacturers:

Thaird 2 do 0 d 2 o 2 o			
		Double Check	
1.	Watts	719 Series	

- 950 XLT series
- Wilkins
   Conbraco DC4A Series

#### 2.04 STOCK WATERERS

- A. Concrete Cased Floor Mounted
  - 1. Shall be reinforced concrete construction and shall include:
    - a. Water bowl with drain plug.
    - b. Stainless steel access panels for electric and water connection.
    - c. Float operated valve with flexible hose connection.
    - d. Electric resistance bowl heaters with thermostatic control and single spout connection.
    - 2. Acceptable Products:

      - a. Cancrete CANCESA50 b. Preifert CANCESA50
- PART 3 EXECUTION
- 3.01 INSTALLATION
  - A. Install in accordance with manufacturer's instructions.
  - B. Backflow Preventer:
    - 1. Install per drawing and manufacturer's instructions.
    - 2. Commission as required.

#### TESTING 3.02

A. Commission backflow preventers.

# SECTION 221300 - SANITARY PIPING

### PART 1 - GENERAL

- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. New sanitary sewer and vent systems.
      - b. New sanitary sewer systems.
      - c. Exploration work to locate existing underground sanitary piping including depth and horizontal location.
      - d. All cutting and patching of existing paving slabs and excavation and backfill required to access and utilize existing piping.
      - e. All utility connection fees required for connection and sewer service.

#### 1.02 DESCRIPTION

- A. Definitions
  - 1. Sanitary piping includes waste and vent piping in building and piping service piping outside of building.
  - 2. Plumbing Contractor = Plumbing Subcontractor or Plumbing Trade.
- 1.03 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 220529 Supports and Anchors for Plumbing.
    - 2. 220553 Identification for Plumbing Piping and Equipment.
    - 3. 221300 Sanitary Waste Piping Specialties.
- 1.04 REFERENCES
  - A. ANSI B31.9 Building Service Piping.
  - B. ASTM D1785 Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
  - C. ASTM D2466 Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.
  - D. ASTM D2564 Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings.
  - E. ASTM D2729 Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.
  - F. ASTM D2751 Acrylonitrile-Butadiene-Stryrene (ABS) Sewer Pipe and Fittings.
  - G. ASTM D2855 Making Solvent-Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings.

## 1.05 SUBMITTALS

- A. Submit under provisions Section 013300.
- B. Product Data: Provide data on no hub connectors and piping accessories. Provide manufacturers catalog information.

- 1.06 PROJECT RECORD DOCUMENTS
  - A. Submit under provisions of Section 017839.
  - B. Record actual locations of valves and cleanouts. Record lateral and vertical locations of underfloor and underground pipe. Locate in relation to walls and surfaces which extend beyond concealing surfaces.
  - C. Obtain A/E review of record documents before or at each pay progress meeting.
- 1.07 QUALITY ASSURANCE
  - B. Valves: Manufacturer's name and pressure rating marked on valve body.
- 1.08 REGULATORY REQUIREMENTS
  - A. Perform Work in accordance with State of Illinois Plumbing Code.
  - B. Sanitary sewer service work shall be done in accord to the regulations and specifications set forth by the Greater Peoria Sanitary District.
- 1.09 DELIVERY, STORAGE, AND HANDLING
  - A. Deliver, store, protect and handle products to site under provisions of Section 016000.
  - B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
  - C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.
- 1.10 ENVIRONMENTAL REQUIREMENTS
  - D. Do not install underground piping when bedding are wet or frozen.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 PLASTIC PIPING FOR WASTE AND VENT
  - A. PVC Pressure Pipe ASTM D1785.
    - 1. Fittings: ASTM D2466.
    - 2. Connections solvent weld ASTM D5264.
  - B. Non-Pressure PVC Pipe: Solid (not foam core) Schedule 40 DWV ASTM D 1785; ASTM D-2665.
    - a. Fittings: PVC.
    - b. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

- PVC Pipe for Sanitary Service: See specifications of Greater Peoria C Sanitary District.
  - 1. Pipe shall be SDR-26 PVC complying with ASTM D-1784.
  - Connections shall be bell and spigpot push-on type with gaskets 2. complying with ASTM D-3213 and ASTM F477.
  - 3. Fittings shall match piping.
- D. Connector Fittings:
  - 1. Shall be "no-hub" type.
  - Shall be one piece neoprene gaskets with full stainless steel 2. housings and stainless steel band clamps. Assembly shall comply with ASTM and CISPI 310.
- Acceptable Products: Ε.
  - 1. Charlotte Figure NH-1.
  - 2.
  - Clamp-All Hi-Torq 80/125. Tyler No hub coupling assembly. 3. Tyler
- PART 3 EXECUTION
- 3.01 EXAMINATION
  - A. Examine areas and conditions under which waste and vent piping is to be installed.
  - Verify that excavations are to required grade, dry, and not overв. excavated, and are free of debris or stones.
  - C. Verify existing piping at new connection points is in sound condition.
  - Verify placement of fixtures and equipment to determine locations of D rough-in connections.
  - Ε. Correct any unsatisfactory conditions before beginning installing piping products of this section. Commencement of installation indicated acceptance of conditions.

#### 3.02 PREPARATION

- Ream pipe and tube ends. Remove burrs. Bevel PVC pipe. Α.
- B. Remove scale and dirt, on inside and outside, before assembly.
- Prepare piping connections to equipment with flanges or unions. с.
- 3.03 EXCAVATION, BEDDING AND BACKFILL
  - Excavate existing fill and material to locate existing piping and to Α. install new. Granular materials shall be saved for reuse providing it is not polluted with mud or building debris.
  - Install new underfloor piping on compacted granular cradle bedding. в. Install at least 3 inches of bedding above top of pipe. Use clean pgravel or sand as bedding.
  - Remaining backfill shall be what was removed from excavation less debris С. or shall be bedding material.

#### 3.04 INSTALLATION

Install in accordance with manufacturer's instructions. Α.

- B. Route piping in orderly manner and maintain gradient.
- C. Install piping to conserve building space and not interfere with use of space. Install pipe parallel or at right angles to building walls. Diagonal runs shall be as shown on drawings.
- D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Install fittings at changes in direction.
- E. Connecting components of unequal size: Install standard reducers or increasers, correctly sized for application indicated. Do not use bushings.
  - 1. Do not reduce size of drainage piping in the direction of flow.
- F. Support and anchor pipe as specified in Section 220529.
- G. Joints:
  - 1. PVC pipe:
    - a. Solvent-welded joints:
  - 2. Conform to requirements of ASTM D 2855.
- H. Soil, Waste, and Vent System:
  - 1. Pitch: Pitch pipe in accord to Plumbing Code of the State of Illinois.
  - 2. Underground Building Drains:
    - a. Locate connection of sewer pipe to existing pipe.
    - b. Start drain installation at system's lowest point. Maintain alignment and grade indicated and provide uninterrupted continuity of invert.
    - c. Install piping with hub on upstream end of pipe.
    - d. Comply with manufacturer's instructions for installation of gaskets. Use only recommended lubricants and sealants.
    - e. Draw swab or drag through pipeline in continuous process, passing each new joint as it is formed.
  - 3. Sanitary Sewer Service:

Building (Below Ground)

- a. Provide a continuous mylar warning ribbon as specified in Section 220553 16" below grade.
- b. Install pipe as noted above.

## 3.05 APPLICATION

A. Application Chart:

Use	Description	Pipe Type	Fitting Type
1.	Sanitary Water and Vent in Building (Above and Below Ground)	Schedule 40 PVC	Solvent Weld PVC
2.	Sanitary Outside of	SDR 26 PVC	Push on Gaskets

- 3.06 ERECTION TOLERANCES
  - A. Establish invert elevations, slopes for drainage to 1/8" per foot for waste piping 4" and larger. Smaller waste piping shall be 1/4" per foot.

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Plumbing Contractor Provide:
      - a. Trench drains with catch basins.
      - b. Sample access station.
- 1.02 DESCRIPTION
  - A. Definitions:
    - 1. Plumbing Contractor = Plumbing Subcontractor for this work.
    - 2. Unfinished areas are those with floors that are unstained and sealed concrete which do not have any other surface finish.
- 1.03 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 220529 Supports and Anchors for Plumbing.
    - 2. 220700 Plumbing Insulation.
    - 3. 221300 Sanitary Piping.
- 1.04 REFERENCES
  - A. ANSI A112.21.1 Floor Drains.
- 1.05 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
  - C. Manufacturer's Installation Instructions: Indicate assembly and support requirements.
- 1.06 PROJECT RECORD DOCUMENTS
  - A. Submit under provisions of Section 017839.
  - B. Record actual locations of cleanouts and trench drains.
- 1.07 OPERATION AND MAINTENANCE DATA
  - A. Submit under provisions of Section 017823.
  - B. Provide manufacturer's instruction for cleaning and the limitations for how devices are cleaned.
  - C. Operation Data: Indicate frequency of treatment required for interceptors.
  - D. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
- 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 016000.
- B. Accept specialties on site in original factory packaging. Inspect for damage.
- 1.09 EXTRA MATERIALS
  - A. Furnish under provisions of Section 017823.
- 1.10 COORDINATION
  - A. With other trades:1. Set heights of drains and cleanouts before concrete work is done.

### PART 2 - PRODUCTS

- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

## 2.02 FLOOR DRAINS

- A. Trench drains:
  - Shall be modular preformed/presloped field modifiable sections constructed of either high density polyethylene plastic or polyester polymer concrete.
  - 2. It shall have a ductile iron frame and grate which matches the formed trench. Grate shall be rated for class C loading, and have a free area of at least 50 square inches per linear foot.
  - 3. The overall width of the frame and grate shall be nominally 12". The flow area shall be a minimum of 8" wide. Bottom shall be cylindrical shape.
  - 4. Sections shall be mountable on iron rebar and shall be supported by concrete poured around them.
  - 5. Sections shall be cut into a matching catch basin and with the same type of grate. Sump shall be 24" long x 24" wide x 24" deep.
- B. Acceptable Products:

		Trench Drain
1.	ACO	Equivalent
2.	Polycast	Equivalent
3.	Zurn	882 Series

C. Basis-of-Design - Zurn 882 Series. ACO and Polycast equivalents shall have similar dimensions. If they do not have similar dimensions or if their grate is not ductile iron with a frame, they are not equivalent.

### 2.03 SAMPLE ACCESS STATION

- A. Shall meet requirements of The Greater Peoria Sanitary District.
- B. Base shall be as manufactured by Leman Precast. It shall have welded wire reinforcing, lifting hooks, top receptor for 12" diameter concrete sewer pipe and cast-in connections for 6" SDR 26 PVC sewer pipe.

- C. Risers shall be 12" Class B reinforced concrete Bell & Spigot sewer pipe. Joints shall be sealed with elastometric seal or compound.
- D. Casting shall be equal to Neenah R-1976 manhole and lid.
  1. Lid shall be 11" diameter with one pickhole and two locking stainless steel bolts.
  - 2. Frame shall have 10" free opening, 8" height and 1-1/4" drop.
- PART 3 EXECUTION
- 3.01 INSTALLATION
  - A. Install in accordance with manufacturer's instructions.
- 3.02 STRUCTURE AND TANK INSTALLATION
  - A. A. Excavate in accordance with Section 221300 for work of this Section. Hand trim excavation for accurate placement of tank to elevations indicated.
  - B. Place bedding material level in one continuous layer not exceeding 8 inches compacted depth, compact to 95 percent.
  - C. Backfill around sides of trench.
  - D. Maintain optimum moisture content of bedding material to attain required compaction density.

SECTION 230529 - SUPPORTS AND ANCHORS FOR HVAC

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - Base Bid: Δ
    - Contractor Provide: 1.
      - Pipe and equipment hangers and supports for HVAC equipment and a. natural gas piping.
      - Sleeves and seals for penetrations involving new pipe. b.
      - Supports for duct. с.
- 1.02 RELATED WORK
  - Specified Elsewhere: Α.
    - 231123 Facility Natural Gas Piping/Digester Gas Piping. 1.
    - 2. 233400 - Fans.
    - 3.
    - 233100 Ductwork. 235400 Fuel Fired Heaters. 4.
- 1.03 SYSTEM DEFINITION
  - Α. HVAC piping includes natural gas piping.
- 1.04 REFERENCES
  - AISC American Institute of Steel Construction. Α.
  - в. ASME B31.2 - Fuel Gas Piping
  - С. ASME B31.9 - Building Services Piping
  - ASTM F708 Design and Installation of Rigid Pipe Hangers. D.
- 1.05 SUBMITTALS
  - Submit under provisions of Section 013300. Α.
  - в. Product Data: Provide manufacturers catalog data including load capacity and firestopping capability. Submit installation techniques to be used for intumescent putty sealants.
  - C. Provide a separate line item and cost on the Schedule of Values.
- 1.06 REGULATORY REQUIREMENTS
  - International Mechanical Code 2012 for support of HVAC piping and Α. equipment.
- 1.07 COORDINATION
  - Α. Sleeves: 1. Coordinate placement with masonry and concrete trades.
  - в. Auxiliary Steel: 1. Coordinate placement before sheathing blocks installation.

# PART 2 - PRODUCTS

# 2.01 MANUFACTURER & PERFORMANCE

- A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 PIPE HANGERS AND SUPPORTS
  - A. Acceptable Manufacturers.
    - 1. B-Line.
    - 2. Grip Strut.
    - 3. Fee and Mason.
    - 4. Grinnel.
    - 5. Unistrut.
  - B. Hanger Description:
    - Side mounted brackets for attachment to wood joist shall be bolt through steel angle or malleable iron bracket equal to B-Line B-3060 or B-3062.
    - Lag-screw anchors with oversized heads tapped for 3/8" rod are acceptable for load not exceeding 300 lbs. These shall be zinc plated carbon steel with wood. 1-1/4" minimum wood thread meeting AISI 1022 and National Coarse 3/8" National Coarse thread rod socket meeting AISI 1018-1022.
    - 3. Strut supports shall be galvanized 14 or 12 gauge rolled carbon steel with galvanized die-formed accessory clamps and fasteners.
    - 4. "J-Hooks" for 2" pipe and smaller shall be 1/4" thick by 1-1/4" wide steel rated for 200 lbs each.
    - 5. Hold down straps shall be die-stamped of galvanized sheet steel or formed of galvanized malleable iron.
  - C. Steel HVAC Pipe: (Natural Gas)
    - 1. Conform to ASME B31.9 and ASTM F708.
    - Hangers for Pipe Sizes 2" and under: Carbon steel, adjustable, Clevis.
    - 3. Multiple or Trapeze Hangers: Steel strut or channels with spacers and hanger rods.
    - 4. Vertical Support: Steel riser clamp.
    - 5. Wall Support: "J-Hooks", struts.

# 2.03 ACCESSORIES

- A. Hanger Rods: Mild steel continuous threaded national coarse thread.
  1. Nuts shall be SAE Grade 3 minimum with cadmium plating and national coarse thread.
  - 2. Lock washers shall be cadmium plated split spring type sized for the rod.
- B. Auxiliary Steel and Trapeze Hangers.
  - 1. Manufactured struts shall be rolled of 12, 14, or 16 gauge material to meet loading required or as noted on Drawings or otherwise specified. It shall have a hot dipped galvanized coating.
- C. Acceptable Products.
  - 1. B-Line.
  - 2. Uni-strut.

3. Grip Strut.

# 2.04 ANCHORS

- A. Masonry or concrete type for pipe or equipment supports. Shall be wedge type with either studs or National coarse female thread. Alternative type shall be self drilling expansion type. Anchors shall be U. L. listed.
- B. Masonry or concrete type for securing escutcheons to masonry shall be "nail-in" type. Unit shall consist of broad head on hollow zinc alloy core with steel drive pin. Provide with dielectric washer.
- 2.05 SLEEVES
  - A. Sleeves for pipes through exterior masonry walls. Schedule 40 solid PVC.
- 2.06 SEALANTS
  - A. Exterior moisture sealant Shall be non-hardening silicone type rated for temperatures of -40 degrees F to 250 degrees F. Material shall be available in white, gray, brown, and black colors. Material shall be sunlight resistant.
  - B. Manufacturer

		Exterior
		Sealant
1.	General Electric	SCS1000
2.	Dow Corning	999A

- 2.07 ESCUTCHEONS
  - A. For piping Shall be chrome finished split faced plastic.
  - B. For multiple pipes or where holes are over large or offset.
    - 1. Utilize pre-painted aluminum sheet fabricated to cover entire hole and seal within 1/4" of the pipe or pipe covering.
    - 2. Holes shall be hole sawed or punched. Holes shall be round.

## PART 3 - EXECUTION

# 3.01 APPLICATION

- A. HVAC Pipe:
  - 1. Hanger and support spacing on steel piping shall be: 5'-0'' for 1/2'' and smaller. 8'-0'' maximum for pipe 3/4'' to 1''.
  - 2. Gas pipe shall be supported with clevis hangers, supported by rods with beam clamps.
- B. Hanger Rod:
  1. Hanger rod size shall be: 3/8" for pipe up to 2" in size and loads up to 360 lbs.
- 3.02 PREPARATION
  - A. Coordination of Trades/Owner:
    - 1. Locate sleeves in conjunction with concrete and masonry trades. Determine exact elevation and lateral position.

## 3.03 ANCHORS

A. Use anchors in concrete or masonry walls and floors.

- B. Drill hole clean of loose material. Install anchor, flush with surface. Size hole in accord to manufacturers' recommendation. Physically test anchor by pulling against it. Loose anchors will not be accepted.
- 3.04 PIPE HANGERS AND SUPPORTS
  - A. Utilize hangers in accord to Application paragraphs.
  - B. Place hangers within 12" of each horizontal elbow.
  - C. Use hangers with 1-1/2" minimum vertical adjustment. Provide lock nuts and washers for hanger rod at all hangers. Provide additional lock nut and washer on clevis hanger cross bolts.
  - D. Support vertical piping such that it cannot be deflected more than 1/8" from center by hand pressure.
  - E. Support riser piping independently of connected horizontal piping.
  - F. Locate hangers for pipe movement without disengagement of supported pipe.
  - G. Provide auxiliary steel to span structure where required. Provide in accord to Paragraph 3.06 below.
  - H. Secure upper attachment from the top side of wood joists. Provide lock nut and washer on each set screw and hanger rod attachment.
  - I. Do not use perforated hanger strap.
- 3.05 SLEEVES, SEALS & ESCUTCHEONS
  - A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
  - B. Place sleeves in forms at location desired. Locate wall sleeves exactly as desired. Openings installed in concrete walls shall be cored drilled. Caulk sleeves.
  - C. Exterior wall penetrations shall be sealed with colored silicone between pipe and sleeve. Pack interior of sleeve with fiberglass batt.
  - D. Provide escutcheon on exposed interior penetrations. Secure escutcheons into place with bead of sealant under. Wipe away exposed sealant.
- 3.06 AUXILIARY STEEL AND EQUIPMENT SUPPORTS
  - A. Hanging Equipment and Materials:
    - 1. Shall be supported from the top or upper side of wood joists.
    - Auxiliary steel shall be manufactured strut, rolled steel shapes or schedule 40 steel piping. Strut shall be sized in accord to the manufacturer's literature unless shown otherwise on Drawings.
  - B. Equipment supports shall be as shown on drawings, and specified.
  - C. Paint cut edges of strut with cold galvanizing finish.

SECTION 230593 - TESTING ADJUSTING & BALANCING FOR HVAC

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - Α. Base Bid:
    - 1. Contractor Provide:
      - Test and balance new exhaust fans shown on drawings. Set minimum a. positions for each speed control.
      - Test and balance new ducted unit heater. b.
      - c. Provide pretest evaluation of existing systems and those shown as new on drawings. List questions for A/E which may be required before balance work can be completed.
      - Provide retesting required in Paragraph 1.04.D. d.
      - Test and adjust airflow to new supply grilles. e.
      - f. Obtain temperature measurements across heating apparatus for heating season.
      - Measure gas consumption rate using utility meter for each furnace g. installed as part this work.
- 1.02 RELATED WORK
  - Specified Elsewhere: Α.
    - 1. 230900 Temperature Controls.
    - 233100 Ductwork. 4.
    - 5. 233300 Air Duct Accessories.
    - 6. 233400 Fans.
    - 7. 233713 Diffusers, Registers and Grilles.
    - 8. 235400 Fuel Fired Heaters.
- SYSTEM DESCRIPTION 1.03
  - Summary: Α.
    - 1. Test and Balance shall:
      - a. Set minimum exhaust airflow.
      - Distribute air around supply diffusers and registers. b.
      - Balance flow distribution so that space temperatures are с. homogenous.
      - Verify duct does not leak and that fans and equipment are d. functioning per design and manufacturer's performance data.
  - Intent of work is to: в.
    - 1. Balance flow distribution so that space temperatures are homogeneous.
    - 2. Verify duct does not leak and that fans and equipment are functioning per design and manufacturer's performance data.
    - 3. Verify ventilation and exhaust flows are as specified.
    - 4. Leave the Owner with a functioning system.
    - 5. Leave Owner with low speed set points for minimum outside air.
  - Definitions: C.
    - 1. Air balance testing and adjusting air system components to achieve design parameters or to evenly distribute available air. Includes both flow and temperature measurements recording of measurements, and adjustment of system to achieve specified air flows.
    - 2. Calibration Comparison of the measured values of an instrument with a known quantity.
    - Testing measurement of temperatures, gas flow, electric current and 3. voltage which show how much heat a furnace is providing.

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#### 1.04 QUALITY ASSURANCE

- Firm shall have personnel certified in accord to one of the standards Α. referenced under REGULATORY REQUIREMENTS or shall be a registered professional Engineer experienced with this type of work.
- в. Personnel doing work on site shall have certifications noted above.
- C. Instrumentation used for testing and balancing shall be calibrated as recommended by industry standards.
- Owner and Architect/Engineer reserve the right to pick four different D. measurements to be remade after the test and balance report is submitted. If two of the four selected measurements are found to be more than 50 percent different than those submitted in the report the entire balance report shall be redone.
- E. Payment for at least twenty percent balance work will not be made until building has been turned over to the Owner. Contractor will not be paid for report submittals which contain acceptable balance reports for fans later found to be running backwards or similarly obvious problems. Payment will not be made for final reports which simply list problems without also providing solutions.
- The A/E will compare measured fan characteristics against the F. manufacturer's published fan curves and tabulated data. Test data which falls outside of the manufacturer's published curves may require retesting subject the A/E review.
- 1.05 REGULATORY REQUIREMENTS AND STANDARDS
  - A. AABC National Standards for Total System Balance.
  - B. ADC Test Code for Grilles, Registers, and Diffusers.
  - ASHRAE 111 Practices for Measurement, Testing, Adjusting, and Balancing C. of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
  - D. NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
  - E. SMACNA HVAC Systems Testing, Adjusting, and Balancing.
  - F. SMARTA - Sheet Metal, Air Conditioning and Roofing Contractors Trade Association of Illinois.
  - TABIC Testing and Balancing Institute for Certification. G.

#### 1.06 SUBMITTALS

- Submit name and qualification certificate of air balance technician who Α. actually does work. Do this at least ten working days before work is to be done.
- Test Reports: Indicate data on standardized form following AABC. SMACNA, Β. SMARTA or TABIC.
- С. Provide written certification from installing contractors systems are in correct working condition and ready for test.
- Field Reports: Indicate deficiencies in systems that would prevent proper D testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- Ε. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
- Submit electronic draft copies of report for review prior to final F. acceptance of Project. Provide final copies for A/E and for inclusion in operating and maintenance manuals.
- Submit cost of balance work as line item on contractors schedule of G. values. Provide name of balance contractor that time.
- н Provide reports in soft cover, letter size, three-hole binder manuals, complete with index page, with cover identification at front and side.
- Include detailed procedures, agenda, sample report forms prior to Τ. commencing system balance.
- 1.07 PROJECT CONDITIONS
  - Building/Construction Conditions: Α.
    - All portions of systems shall be complete before balance work is 1. begun. Grilles and diffusers shall be in place.
  - B Ambient Conditions:
    - Temperature measurements across heating coils shall be made when 1. ambient temperatures are 40 degrees F or less.
    - Balance work which does not involve heating apparatus shall be 2. accomplished when ambient temperatures are above 20 degrees F and less than 80 degrees F.
- 1.08 SEQUENCING
  - Do not do work until systems are complete. Α.
  - Work with temperature installer to balance devices under all operational в. sequences.
- PART 2 PRODUCTS
- MANUFACTURER & PERFORMANCE 2.01
  - Unless otherwise specified the manufacturer's number specified or Α. scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- PART 3 EXECUTION
- 3.01 EXAMINATION
  - Verify that systems are complete and operable before commencing work. Α. Ensure the following conditions:

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- Systems are started and operating in a safe and normal condition. 1.
- Temperature control systems are installed complete and operable. 2.
- Proper thermal overload protection is in place for electrical 3. equipment.
- 4. Duct systems are clean of debris.
- 5. Fans are rotating correctly.
- 6. Access doors are closed and duct end caps are in place.
- 7. Air outlets are installed and connected.
- 8. Duct system leakage is minimized.
- Submit field reports immediately by telephone, email or facsimile. Report Β. defects and deficiencies noted during performance of services which prevent system balance. Do not report defects and deficiencies in written reports except as preliminary situations for which remedies were found.
- 3.02 PREPARATION
  - Provide instruments required for testing, adjusting, and balancing Α. operations. Make instruments available to Architect/Engineer to facilitate spot checks during testing.
  - Provide additional balancing devices as required. Β.
- 3.03 FIELD QUALITY CONTROL
  - Air Handling Systems: Adjust to within plus or minus five (5) percent of Α. design for supply systems and plus or minus five percent of design for return and exhaust systems.
  - в. Air Outlets and Inlets: Adjust outlets and inlets in space to within plus or minus five percent of design.
- 3.04 ADJUSTING
  - A. Ensure recorded data represents actual measured or observed conditions.
  - Permanently mark settings of speed switches allowing settings to be в. restored.
  - C After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
  - D. Leave systems in proper working order, replacing covers, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
  - At final inspection, recheck random selections of data recorded in report. Ε. Recheck points or areas as selected and witnessed by the Owner.
- 3.05 AIR SYSTEM PROCEDURE
  - Adjust air handling and distribution systems to provide required or design Α. supply, and exhaust air quantities.
  - в. Measure air quantities at air inlets and outlets, with calibrated flow hood. Do not use velocity traverse of duct without approval of the A/E.
  - Adjust distribution system to obtain uniform space temperatures free from С. objectionable drafts and noise.
  - Use volume extractors to regulate air quantities. D.

- Ε. Vary total system air quantities by adjustment of fan speeds. Set speed switches.
- F. Measure static air pressure conditions on unit heaters.
- TESTING AND BALANCING 3.06
  - Motors 1/3 Horsepower and Larger: Α.
    - 1. Check and record full load amperes.
    - 2. Report any motors which are overloaded, defective, or operating within their service safety factor.
  - At Fans and Unit Heaters: в.
    - Measure: 1.
      - a. Air flow.
      - b. Total static pressure.
      - c. RPM.
  - All work for related equipment shall be done on the same day and time. C.
- 3.07 REPORTS

3.

- Report forms: Α.
  - 1. Title Page:
    - a. Project name and location.
    - b. name of test and balance technician.
    - c. Report date.
  - 2. Summary Comments:
    - a. Final performance.
    - b. Notable characteristics of system.
    - c. Nomenclature used throughout report.
    - d. Test conditions.
    - Instrument List:
      - a. Instrument.
      - b. Manufacturer.
      - c. Model number.
      - d. Serial number.
      - e. Range.
      - Calibration date. f.
  - 4. Electric Motors:
    - a. Manufacturer.
    - b. Model/Frame.
    - c. HP/BHP.
    - d. Phase, voltage, current, both nameplate and actual.
    - e. RPM.
    - f. Service factor.
    - g. Starter size, rating, heater elements.
    - h. Sheave Make/Size/Bore.
  - 5. Exhaust Fan Data:
    - a. Location.
      - b. Manufacturer.
      - Unit number. c.
      - d. Air flow, specified and actual.
      - e. Total static pressure specified and actual.
      - f. Current loading of motor.
      - g. Marked set point of fan speed control.
  - 8. Furnaces:
    - a. Unit number and use.

- b. Name plate gas input rate.
- c. Name plate output rate.
- d. Total temperature difference across furnace.
- e. Manufacturer's stated efficiency.
- f. Air flow through furnace.
- g. Calculation of furnace output.
- h. Air flow specified and actual.
- i. External static pressure, of unit heater.

SECTION 230900 - TEMPERATURE CONTROLS

# PART 1 - GENERAL

- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. Installation of controls specified with heating equipment.
      - b. Thermostat programming to provide sequence of operation herein specified.
      - c. Miscellaneous assorted control connections and wiring and devices to make system function.
      - d. All wire conduit tubing and cable required to complete systems.
      - e. Commissioning and startup of control systems and the equipment
      - they control for both heating and cooling systems.
      - f. Training as to how to use temperature control system.
      - g. Thermostat enclosures.
  - B. Alternate Bid:
    - 1. Contractor Provide:
      - a. Control of natural gas furnaces furnished with roof top units.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 230593 Testing, Adjusting Balancing for HVAC.
    - 2. 233423 Fans.
    - 3. 235400 Fuel Fired Heaters.
- 1.03 REFERENCES
  - A. ANSI/NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
  - B. ANSI/NFPA 90A Installation of Air Conditioning and Ventilation Systems.
- 1.04 SYSTEM DESCRIPTION
  - A. Definition:1. Temperature Control Temperature Control Subcontractor.
- 1.05 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Product Data: Include description and engineering data for each control system component. Include sizing as requested.
  - D. Operation and Maintenance and Training Data:
    - 1. Submit Training curriculum prior to training meeting. Include aspects of:
      - a. Programming thermostats.
      - b. Accessing menus and controls though passwords and combination of pushing buttons.
      - c. Highlighted sections of Owner training and installation that apply specifically to the Takin Facility.
  - E. Schedule of Values:

- 1. Shall list the name of the business entity whose employees actually perform the work listed in this section.
- 2. Separate line items with applicable costs shall be listed for each of the following:
  - a. Software programming labor/programming of package thermostat controls.
  - b. Material and equipment costs.
  - c. Installation labor of materials and equipment.
  - d. Startup/commissioning of control systems.
  - e. Training of Owner's personnel and preparation of training materials and maintenance manuals.
- 1.06 PROJECT RECORD DOCUMENTS
  - A. Submit record documents under provisions of Section 017839.
  - B. Accurately record actual location of control components, including safety devices, thermostats, and sensors.
  - C. Revise shop drawings to reflect actual installation and operating sequences.
- 1.07 OPERATION AND MAINTENANCE DATA
  - A. Submit operation and maintenance data under provisions of Section 017823.
  - B. Include systems descriptions, set points, and controls settings and adjustments.
  - C. Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.
  - D. Format and Content:
    - 1. The manual shall include data for only those controllers and systems actually installed. Manufacturer's standard publications shall be highlighted to reflect the system actually used and edited to delete the systems, controllers and equipment not actually used. A cover sheet or sheets which define the correct equipment is acceptable but does not fill the requirements noted above for editing and highlighting.
    - 2. The manual shall be 8-1/2" x 11" paper size, or shall be bound into a complete booklet by the manufacturer.
    - 3. There shall be a separate section for each type of equipment. Equipment names used for the work shall be noted on maintenance manuals.
- 1.08 OWNER INSTRUCTION AND COMMISIONING

A. System Operation:

- 1. Controls and equipment which is controlled shall be fully operational and tested by the respective trades which installed the devices. Corrective work shall be performed. Contractor shall review work of all related trades. Work like energizing controls, equipment start up shall be completed. Notify equipment installers of nonfunctioning items. This shall be done prior to substantial completion.
- 2. Contractor shall list schedule items required from the Owner so that programming can be completed. Allow a minimum of one week for the Owner to provide this schedule.

- 3. Obtain from the Owner a list of those individuals who are authorized to provide schedules to the contractor and to receive instructions regarding system operation.
- B. Owner Instruction:
  - 1. Instruction shall be provided on at least two separate times with a one week minimum period between.
  - 2. Provide a sign up sheet for all personnel who attend training sessions.
  - 3. Notify the Owner at least two weeks before instructional sessions are needed. Coordinate instructional time at Owner's convenience during normal workday.
  - 4. Simply telling whomever of the Owner's personnel who may be on site when the hardware installation is complete does not meet this specification.
- C. Training Material:
  - 1. Shall be O&M Manual noted above.
  - 2. Shall include troubleshooting potential problems.
  - 3. Shall include photographs or drawings of the systems as they are actually installed.
  - 4. Shall cover routine maintenance. Provide separate reproducible check lists for daily, weekly, monthly and yearly maintenance.
  - 5. Include name and telephone number of trained individual who will answer questions on the project.
- C. Training Medium:
  - 1. Provide instruction in written form. Supply at least four copies for use by the Owner.
- D. Obtain a signed attendance sheet for each training session. Turn a copy of these sheets over to the A/E and the Owner.
- 1.09 QUALIFICATIONS
  - A. Installing Contractor:
    - 1. Shall have local service capability which can service a control problem within two hours of being called by the Owner.
    - 2. Shall have the "In-House" capability of installing software for controllers' installed.

### 1.10 SEQUENCING AND SCHEDULING

- A. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.
- B. Coordinate work and ensure system is completed and commissioned by Date of Substantial Completion.
- C. Coordinate installation of system components with installation of mechanical systems equipment such as unit heaters.
- 1.11 WARRANTY
  - A. Provide one year warranty for all parts and labor beginning with the date of substantial completion.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE

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- A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- B. See 235400 Fuel Fired Heaters.
- C. Wiring shall be in accord to Division 26, except that plenum rated low voltage multi-conductor cable shall be used at truss level. Cable for electric signal shall be no less than 18 gauge. Cable for electronic signal shall be shielded and acceptable to the control system manufacturer. Jacket color shall not be red or blue or green.
- 2.03 GUARDS AND COVERS
  - A. Metal covers shall be high abuse type with hinged lid, key lock and solid back plate. Cover shall be perforated or have integral grill. Size shall be minimum of requirement of thermostat specified with heater.
  - B. Acceptable Products: Metal
    1. Honeywell TG51 Series
    2. White Rogers F-29 Series
- 2.04 SEQUENCE OF OPERATION
  - A. Gas Unit Heaters:1. Shall start and heat when room temperature falls below set point. Heaters stages shall stage on.
- PART 3 EXECUTION
- 3.01 EXAMINATION
  - A. Verify that systems are ready to receive work.
  - B. Beginning of installation means installer accepts existing conditions.
- 3.02 INSTALLATION
  - A. Install in accordance with manufacturer's instructions.
  - B. Run T-stat exposed only in truss spaces, in neat manner supported from piping or conduit or structure.
  - C. Mechanically attach wiring to supporting surfaces.
  - D. Locate thermostat as detailed on drawings. Mount thermostats with pads and operable levers, dials and buttons as detailed on Drawings.
  - E. Mount controls adjacent to associated equipment on vibration free walls. Provide engraved plastic nameplates for instruments.
  - F. Provide junction boxes for thermostat connections. Provide conduit on wall up to joist level.

- G. All wire ends shall be labeled and coded to match installation drawings. Wires extending to remote switches and thermostats shall be labeled or coded to indicate line side and switched side.
- H. After completion of installation, test and adjust control equipment. Submit data showing set points and final adjustments of controls.
- I. Provide all software input and troubleshooting to make system work.

SECTION 231123 - FACILITY NATURAL GAS PIPING/DIGESTER GAS PIPING

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. Natural gas piping system from the high pressure side of the regulator serving the Muntjac building to the unit heater.
      - b. Relief piping from equipment regulators.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    1. 230529 Supports and Anchors for HVAC.
    2. 235400 Fuel Fired Heater.
- 1.03 REFERENCES
  - A. The International National Mechanical Code (BOCA) 2012.
  - B. The International Fuel Gas Code (BOCA) 2012.
  - C. NFPA 54 National Fuel Gas Code.
- 1.04 DESCRIPTION
  - A. Shall be combination of 2 psi and inches of water with both underground and above ground portions.
- 1.05 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Submit product data. Clearly note which devices described in the data area proposed for the work.
  - C. Provide manufacturers literature on gas regulators. Show capacity, pressure drop, spring range and construction. Provide UL listing for valves.
  - D. Provide manufacturers installation and maintenance data for regulators.
  - E. Submit line item price for gas pipe on Schedule of Values. Identify subcontractor whi actually installs.
- 1.06 WARRANTY

Α.

- A. Warranty material and workmanship for period on one year starting with date of substantial completion.
- 1.07 COORDINATION
  - With Owner: 1. Interruption of Owner's existing service shall be at Owner's convenience. Interruption periods shall be minimized.

- 2. Assist Owner to purge existing gas pipe and relight existing equipment pilots.
- 3. Do not leave existing systems disconnected when ambient temperatures are expected to fall below 50 degrees F.

# PART 2 - PRODUCTS

# 2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

## 2.02 PIPING

- A. Above grade pipe 2" and smaller shall be schedule 40 black steel made in accord with ASTM A-53 or A-120. Fittings shall be black malleable iron with threaded connections. Connections shall be made with teflon paste, formulated for use with natural gas.
- B. Underground piping outside of buildings shall be SDR 11 polyethylene made in accord with ASTM D 2513. Fittings shall be epoxy coated compression type. Riser adaptor shall be epoxy coated formula 40 steel with compression connector.
- 2.03 VALVES
  - A. Stop Valves 2" and smaller shall:
    - 1. Be bronze body with threaded ends.
    - 2. Be two piece ball type with teflon seats and packing.
    - 3. Be UL listed for use with natural gas.
  - B. Regulator Valves shall:
    - 1. Be rated to provide capacity and pressure reduction shown on the Drawings.
    - 2. Have capability of positive dead end lock-up.
    - 3. Have capacity of accepting a 65 psi emergency exposure.
    - 4. Have surge arrestor and dust cap.
    - 5. Have field replaceable spring and adjustable spring range.
    - 6. Have built in relief valves.
  - C. Acceptable Products:

		Regulator	Stop Valve 2"
		Valve	and Smaller
1.	Equimeter/Sensus	043 Series	
2.	Apollo		80 Series
3.	Watts		FBV-1
4.	Red & White		RW 5200 Series
5.	Maxitrol	325 Series	

## 2.04 UNDERGROUND IDENTIFICATION TAPE

- A. Shall be 2" wide polyester/aluminum laminate printed with "CAUTION BURIED GAS LINE" in yellow color. Shall have a No. 12 coper wire buried with it.
- B. Acceptable Products:

- Detectable Identoline. 1. Brady
- 1.Brady2.EMED Co.Underground warming2.SetonMetallic Detection Tape. Underground Warning Tape.
- PART 3 EXECUTION
- 3.01 APPLICATION
  - Above grade gas and gas vent pipe shall be black steel specified. Α.
  - в. Galvanized fittings shall not be used.
  - C. Polyethylene pipe shall be used underground outside of buildings.
- 3.02 EQUIPMENT CONNECTIONS
  - Α. Equipment shall be connected only on low side of regulator.
  - Β. Equipment shall be connected through a stop valve, union and dirt leg in that order. Dirt leg shall always be made at a change in direction. A dirt leg dropping form the runout of an in-line tee is not acceptable.
  - C. Final equipment connection shall be full size of opening. Do not bush or reduce connection size.
  - Drop sizes shall be as shown on drawings. D.
  - Ε. Provide all fittings and adaptors required to connect equipment.
- 3.03 REGULATORS
  - Vents from regulators located inside of buildings shall be piped full size Α. to out of doors, unless shown otherwise on drawings. Do not reduce. Terminate vent with screened elbow turned down.
  - Regulators shall be located out of doors. в.

#### 3.04 PIPING

- Piping shall be squarely cut and threaded with sufficient thread to Α. penetrate fitting and valve a minimum of four turns.
- Piping shall be reamed and deburred. Oil and metal shavings shall be B wiped or blown out of each piece before assembly.
- Pipe shall be supported in accord to Section 230529. Pipe shall have С. supports within 2'-0" of each change in direction. Pipe shall be supported independently of equipment and regulator valves.
- D. Changes in pipe size shall be made with reducing tees or reducing couplings. Do not use bushings.
- Drops shall always be made from the branch connection of a tee. Ε. "Bullheaded tees" shall not be installed.
- F. Caulk penetrations through outside wall with silicone matching building color. Penetrations made through concrete or masonry walls shall be sleeved with Schedule 40 PVC or coredrilled opening. Seal per Section 230529.

G. Underground gas piping shall be buried a minimum of 24" below grade. Pipe shall be solidly back-filled with granular material. Back-fill shall not contain rocks or debris larger than 1" in diameter. Install underground warning tape 6" above pipe under floor slabs and 12" below grade. Install No. 12 copper wire at same level as pipe. Extend wire above surface. Risers above grade shall be epoxy coated steel pipe accessories. Connection shall be made with specified couplings covered with insulating tape. Cut and thread riser to height appropriate for gas equipment. Terminate with valve.

# SECTION 233100 - DUCTWORK

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:1. Contractor Provide:a. Provision of new supply and exhaust duct.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 230529 Supports and Anchors for HVAC.
    - 2. 230593 Testing, Adjusting and Balancing for HVAC.
    - 3. 233000 Air Duct Accessories.
    - 4. 233713 Diffusers, Registers and Grilles.
- 1.03 SYSTEM DESCRIPTION
  - A. Definitions:
    - 1. Ventilating Contractor = Ventilating Subcontactor.
    - 2. Supply Ductwork That duct downstream of heater which discharges to a space.
    - 3. Exhaust Ductwork That duct downstream of exhaust registers and grilles which discharges to the out-of-doors.
    - 4. Exposed duct is that which can be seen from the floor of public and employee spaces.
    - 5. Visible behind grilles diffusers and register means able to be seen by an individual who is sitting in a chair or standing on the floor through the louvers or blades of the diffuser grille or register.
- 1.04 QUALITY ASSURANCE
  - A. Installers and Fabricators shall be fully familiar with S.M.A.C.N.A Construction Standards.
- 1.05 REGULATORY REQUIREMENTS AND STANDARDS
  - A. NFPA 90A Installation of Air Conditioning and Ventilating Systems.
  - B. SMACNA HVAC Duct Construction Standards Metal and Flexible.
  - C. UL 181 Factory-Made Air Ducts and Connectors.
  - D. International Mechanical Code 2012.
- 1.06 SUBMITTALS
  - A. Submit under provisions of Section 013300.
  - B. Product Data:
    - 1. Provide data for manufactured duct and fittings.
    - 2. Provide material safety data sheets for sealants.
  - C. Submit line item price for duct on Schedule of Values. Identify supplier vendor.
- 1.07 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 017839.
- B. Record actual locations of ducts and changes in duct size.

# PART 2 - PRODUCTS

- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 MATERIALS
  - A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.
  - B. Fasteners: Rivets, bolts, or sheet metal screws. Match material type of metal.
  - C. Sealants shall be flexible setting water based, water resistant type compatible with ducts sealed. Shall have flame spread no more than 5.0 when .020" thick. Shall have anti-microbial agents. Material shall be listed and labeled in accordance to UL 181 A, B or C as applicable.
- 2.03 DUCTWORK FABRICATION
  - A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated. Duct shall be able to accommodate pressures of plus/minus 2" of water gauge without collapse or leaks.
  - B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Provide these whether or not they are shown on the drawings.
  - C. Increase duct sizes gradually, not exceeding 30 degrees divergence.
  - D. Exposed duct shall be made with a minimum of joints and seams. Joint clip ends shall be removed where they overlap the width and/or height of the duct. Longitudinal seams shall be sealed and hammered tight per installation paragraph below.
  - E. Remove excess sealant, fabrication and installation marks, stamps and labels, and printed steel manufacturer's labels from the outer surfaces of exposed ductwork.
- 2.04 MANUFACTURERED DUCTWORK AND FITTINGS
  - A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated. Shall be rated for positive pressure of 6" of water gauge.

- B. Round Duct Spiral:
  - 1. Manufacturers:
    - a. Lindab
    - b. Set Duct Manufacturing
  - 2. Machine made from round spiral lockseam duct with light reinforcing corrugations; fittings manufactured of sheet metal at least two gauges heavier than duct.
- PART 3 EXECUTION
- 3.01 SYSTEM DESIGN AND COORDINATION
  - A. Provide all miscellaneous materials and devices needed for a complete functioning, serviceable and code worthy system.
- 3.02 SEQUENCING AND SCHEDULING
  - A. Coordinate work with other trades and Contractors. Review Drawings of other Contracts to determine interaction between trades.
  - B. Access to work shall be coordinated with General Contractor and the Owner. See notes on Drawings.
- 3.03 APPLICATION
  - A. Galvanized steel duct shall be used throughout.
  - B. Use spiral formed manufactured duct and fittings downstream of transition.
  - G. Use flexible metal duct inside of existing chase walls. Bends shall be made with fabricated 90 degrees galvanized steel elbows.
- 3.04 INSTALLATION
  - A. Duct seams and joints shall be hammered, rolled or sealed airtight. All transverse and longitudinal joints in supply, return and exhaust ducts shall be sealed with sealant specified. Corners on fittings and connections to equipment shall be sealed tight. Joints in adjustable round elbows shall be sealed tight. No leaks will be allowed.
  - B. Apply duct sealant according to manufacturer's instruction. Allow sealant material to acclimate before application. Do not install when space temperature is less than 40 degrees F. Remove excess material on exposed duct.
  - C. Use crimp joints with bead for joining round duct.
  - D. Use flexible cable supports.
  - E. Flanged connections shall have reinforced bolted corners and spring steel clips around full perimeter.
  - F. Sharp corners on standing seams and supports shall be bent over and ground smooth.
- 3.06 FIELD QUALITY CONTROL

- A. Visual Inspection Contractor shall provide visual inspection of work as it progresses to insure supports, sizes, configuration and tightness specified is maintained. A/E will occasionally inspect for same qualities.
- B. If Testing and Balancing performed in Section 230593 shows fan horsepower and pressure curves do not match the volumetric readings obtained at the inlets and outlets the ducts, the ducts shall be re-inspected visually.
- C. Whenever Testing and Balancing or Owner inspections determine there may be leaks in the duct system, seal openings found. Redoing Test and Balance work is an acceptable method of proving duct is airtight.

# SECTION 233300 - AIR DUCT ACCESSORIES

#### PART 1 - GENERAL

- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. Duct access doors.
      - b. Back Draft Dampers.
      - c. Volume controls/Extractors.
      - d. Flexible connections.
      - e.

# 1.02 RELATED WORK

- A. Specified Elsewhere:1. 233100 Ductwork.
- 1.03 REGULATORY REQUIREMENTS AND STANDARDS
  - A. International Mechanical Code 2012.
  - B. NFPA 90A Installation of Air Conditioning and Ventilating Systems.
  - C. NFPA 70 National Electrical Code.
  - D. SMACNA HVAC Duct Construction Standards Metal and Flexible.

#### 1.04 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Provide for dampers, access doors and extractors.
- 1.05 DELIVERY, STORAGE, AND HANDLING
  - A. Deliver, store, protect and handle products to site under provisions of Section 016000.
  - B. Protect dampers from damage to operating linkages and blades.

#### PART 2 - PRODUCTS

#### 2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

#### 2.02 BACKDRAFT DAMPERS

- Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: Aluminum, with end pivoted blades of maximum 4-1/2" width, with flexible vinyl sealed edges, Α. linked together in rattle-free manner with 90 degree stop, nylon or acetal bushings, and plated steel pivot pins. Frame shall be square for internal duct mount.
- B. Acceptable Products:

Multi-Blade

- 1. Ruskin BD-2
- 2. Greenheck WD-400
- 2.03 DUCT ACCESS DOORS
  - Conventional access doors shall be of double wall steel construction with Α. 1" insulation. Provide with piano hinge. Provide one cam lock for doors less than 16" wide and two for larger doors. Provide with foam gaskets and lock down tabs. Door and frame shall be 22 gauge galvanized steel.
  - B. Acceptable Products:

	-	Conventional
1.	Cesco	Model CAD
2.	National Control Air	Model AD
3.	Nailor	Model OBS Series
4.	Ruskin	Model ADH-22
5.	Vent Products	Ventlock
б.	Safe Air	SAH

- 2.04 FLEXIBLE DUCT CONNECTIONS
  - Fabricate in accordance with SMACNA HVAC Duct Construction Standards -Α. Metal and Flexible, and as indicated.
  - Connector: Fabric crimped into metal edging strip. в.
    - 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq. yd.

    - Net Fabric Width: Approximately 3" wide.
       Metal: 1" wide, 24 gage galvanized steel.
    - Fabric for connections exposed to weather shall be resistant to ultra 4. violet light.

#### 2.05 VOLUME CONTROL DEVICES

- Fabricate in accordance with SMACNA HVAC Duct Construction Standards -Α. Metal and Flexible, and as indicated.
- в. Volume Extractors:
  - 1. Shall be gang operated parallel vanes set on 1" centers. Blades shall move from 45 degrees open to fully closed.
  - Units shall be constructed of aluminum with corrosion resistant 2. fasteners.
  - 3. Configuration shall use supporting rods on back sides.
- C. Acceptable Products:

		Volume Extractor
1.	Titus	AG-45
2.	Price	AE 1 or 2

PART 3 - EXECUTION

# 3.01 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 233100 for duct construction.
- B. Provide backdraft dampers as shown.
- C. Provide duct access doors for inspection and cleaning at back draft dampers.
- D. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.
- E. Provide volume extractors on duct take-offs to drum louvers.

# SECTION 233423 - FANS

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:1. Contractor Provide:a. Exhaust fans for all areas noted.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 233100 Ductwork.
    - 2. 233300 Air Duct Accessories.
    - 3. 230593 Testing, Adjusting and Balancing for HVAC.
- 1.03 REFERENCES
  - A. AMCA 99 Standards Handbook.
  - B. AMCA 211 Laboratory Methods of Testing Fans for Rating Purposes.
  - C. AMCA 261 Directory of Products Licensed to bear the AMCA Certified Ratings Seal.
  - D. AMCA 300 Test Code for Sound Rating Air Moving Devices.
  - E. AMCA 311 Method of Publishing Sound Ratings for Air Moving Devices.
  - F. NEMA MG1 Motors and Generators.
  - G. NFPA 70 National Electrical Code.
- 1.04 DESCRIPTION
  - A. Definition:
     1. Ventilating Contractor = Ventilating Subcontractor for this work.

# 1.05 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Provide data on fans and accessories including fan curves with specified operation point clearly plotted, sound power levels at rated capacity, and electrical characteristics and connection requirements. Fan curves are required. Single points will not be acceptable.
- C. Manufacturer's Installation Instructions.
- D. Submit line item price for fans on Schedule of Values. Identify supplier vendor.
- 1.06 OPERATION AND MAINTENANCE DATA
  - A. Submit under provisions of Section 017823.
  - B. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

# 1.07 COORDINATION

- A. With Electrical Trades:
  - 1. Deliver speed controls for installation.
  - 2. Confirm rough-in location of devices.
- B. With General Trades:
  - 1. Locate wall penetrations.
  - 2. Provide auxiliary support steel sizes.

## PART 2 - PRODUCTS

- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 PRODUCT REQUIREMENTS
  - A. Performance Ratings: Conform to AMCA 211 and bear the AMCA Certified Rating Seal.
  - B. Sound Ratings: AMCA 311, tested to AMCA 300, and bear the AMCA Certified Sound Rating Seal.
  - C. Fabrication: Conform to AMCA 99.
  - D. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- 2.03 CENTRIFUGAL FANS
  - A. Centrifugal Ceiling Fans:
    - Fan wheel shall be forward curved; Mechanically fastened and/or welded; Statically and dynamically balanced; Keyed to motor shaft.
    - 2. Fan drive shall be direct driven from motor.
    - 3. Fan housing shall be constructed of galvanized steel with minimum of 1/2" of coated fiberglass acoustical liner.
    - 4. Electrical Characteristics and Components:
      - a. Motor: Shall be EC type that converts 115 volts alternating current power to DC power operable in the 2-10 VDC range. Shaft bearings shall be permanently lubricated.
      - b. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
      - c. Disconnect Switch: Toggle type.
      - d. Speed Control shall include 24 volt transformer, remote dial control that will fit in a standard 2x4 electrical junction box and intermittent cabling to motor.
    - 6. Grille: Formed aluminum with baked white enamel finish. Fasteners shall be screw type.
    - 7. Backdraft damper shall be integral with fan discharge.
  - C. Acceptable Products:
    - 1. Greenheck SP-AXXX-VG See Schedule on Drawings

# PART 3 - EXECUTION

# 3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Ceiling Fans:
  - 1. Support from structure above. Use equipment supports specified in 220529. Support independently from ductwork.
  - 2. Provide flexible connections on fans rated at 1/4 horsepower and above.
  - 3. Grilles shall be square with lines of room.
- C. Do not operate fans for any purpose until duct work is clean, bearings lubricated, and fan has been test run under observation.

SECTION 233723 - HVAC GRAVITY VENTILATORS

- PART 1 GENERAL
- 1.01 WORK INCLUDES
  - A. Base Bid:1. Contractor Provide:a. Triangular Gable End Louvers.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    - 1. 230593 Testing Adjusting and Balancing for HVAC.
    - 2. 233100 Ductwork.
    - 3. 233000 Air Duct Accessories.
- 1.03 REFERENCES
  - A. ADC 1062 Certification, Rating and Test Manual.
  - B. AMCA 500 Test Method for Louvers, Dampers and Shutters.
  - C. ARI 650 Air Outlets and Inlets.
  - D. ASHRAE 70 Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.
  - E. SMACNA HVAC Duct Construction Standard Metal and Flexible.
  - F. NFPA 90A Installation of Air Conditioning and Ventilating Systems.
- 1.04 SUBMITTALS
  - A. Submit under provisions of Section 013300. Contractor's shall examine submittals furnished by suppliers and determine if submittals are complete an accurate before forwarding them to the A/E. Submittals for this section shall include:
    - 1. Real louver color chart and color samples.
    - 2. Height and width dimensions of louvers and verification that subcontractors and general contractors have verified these items.
  - B. Submittals without evidence of contractor verification or without schedules will be returned to contractors before A/E reviews them further.
  - C. Submit layouts on duct drawings.
  - D. Color samples shall be submitted before or with other submittals. Submit approximate days color selection will add to delivery time. Samples shall be actual material on which color is applied. Printed or electronic color charts are acceptable only to select general family of color. Final color selection shall be made with sample, unless directed otherwise by the Architect
  - E. Submit line item price for louvers on Schedule of Values. Identify supplier vendor.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE

- A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.03 LOUVERS
  - A. Drainable type shall be 4" deep with blades having integral gutters and downspouts, heavy channel frame, birdscreen with 1/2" square or diamond mesh. Blades shall be on 30 to 45 degree angle.
  - B. Fabrication: Extruded aluminum, welded assembly, with factory Kynar finish with color selected by the A/E.
  - C. Mounting: Furnish with screw holes in jambs for installation. Provide aluminum sill under each louver.
  - D. Assembly shall be AMCA rated to pass no more than .025 oz/sq. ft/15 minutes at 1100 FPM intake velocity.
  - E. Unit shall have pressure drop no higher than scheduled for CFM scheduled.
  - F. Acceptable Products:
    - 1. Ruskin ELF375D
    - 2. Greenheck ESD-403
- PART 3 EXECUTION
- 3.01 INSTALLATION
  - A. Install in accordance with manufacturer's instructions.
  - B. Louvers in New Walls:
    - 1. Coordinate opening with General Trades to accommodate opening, framing and fascia's.
    - 2. Opening shall be no larger than needed to accommodate new louver and sleeve.
    - 3. Provide a galvanize steel sleeve through full depth of louver which is fully concealed by the louvers sill plate and sides. Secure sleeve on backside of wall with escutcheon angle.
    - 4. Pack voids between structure and sleeve with urethane foam.
    - 5. Install louver into sleeve with front flush with outer wall. Secure louver to sleeve from inside with fasteners on maximum of 12" centers and at corners. Seal full perimeter of louver and fascia with colored silicone which most closely matches louver color.

SECTION 235400 - FUEL FIRED HEATERS

## PART 1 - GENERAL

- 1.01 WORK INCLUDES
  - A. Base Bid:
    - 1. Contractor Provide:
      - a. Gas fired unit heater.
      - b. Thermostat for each unit heater.
      - c. Combination vent/intake.
      - d. Miscellaneous control devices.
- 1.02 RELATED WORK
  - A. Specified Elsewhere:
    1. 230593 Testing, Adjusting and Balancing for HVAC.
    2. 231123 Facility Natural Gas Piping/Digester Gas Piping.
- 1.03 REFERENCES
  - A. ANSI/ASHRAE 103 Heating Seasonal Efficiency of Central Furnaces and Boilers, Methods of Testing.
  - B. ANSI/NFPA 90B Installation of Warm Air Heating and Air Conditioning Systems.
  - C. ANSI/Z223.1 (NFPA 54) National Fuel Gas Code.
  - D. NFPA 90A Installation of Air Conditioning and Ventilating Systems.
  - G. ASHRAE 1 IESNA 90.1-2007 Energy Efficient Design of New Buildings except Low-Rise Residential Buildings.
- 1.04 REGULATORY REQUIREMENTS
  - A. The International Mechanical Code 2012.
  - B. The International Fuel Gas Code 2012.
  - C. NFPA 90.
  - D. NFPA 54 Fuel Gas Code.
  - E. The International Energy Conservation Code 2009.

# 1.05 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Provide manufacturer's literature and data indicating rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams. Provide tables relating volumetric capacity with external static pressure for unit heater.
- D. Manufacturer's Installation Instructions: Indicate rigging, assembly, and installation instructions.
  - 1. Provide blank copy of manufacturer's check list for startup and initial operation of the unit.

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- E. Manufacturers control drawings shall indicate all required devices. Drawings shall be particular for unit. Indicate all field installed devices.
- F. Submit line item price for unit heater on Schedule of Values. Identify supplier vendor. Submit a separate line item cost for the startup commissioning for all furnaces.
- 1.06 OPERATION AND MAINTENANCE DATA
  - A. Submit operation data under provisions of Section 017823.
  - B. Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listing.
  - C. Submit executed manufacturer's check list for the startup and commissioning of unit heater.
- 1.07 WARRANTY
  - A. Extend warranty period for fuel fired equipment to include one complete uninterrupted heating season after substantial completion.
  - B. Provide manufacturer's five year warranty for heat exchanger. Provide executed warranty cards and notifications for the particular equipment used for this project.
- PART 2 PRODUCTS
- 2.01 MANUFACTURER & PERFORMANCE
  - A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.
- 2.02 UNIT HEATERS
  - A. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, motor and drive, heat exchanger, burner or heater, controls.
  - B. Performance Ratings: Seasonal efficiency to ANSI/ASHRAE 103 (thermal efficiency of 80 percent).
  - C. Configuration shall be sealed combustion (separated combustion) type.
  - D. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation and reflective liner.
  - E. Heat Exchanger: 409 Stainless steel with stainless steel drip pan.
  - F. Combustion Chamber: ANSI/UL 727; welded stainless steel.
  - G. Supply Fan: Centrifugal forward curved type with direct drive.
  - I. Motor shall be split capacitor 3-speed type with permanently lubricated bearings and open drive.

- J. Burner:
  - 1. Gas Burner: Power vented in shot stainless steel type with adjustable combustion air supply, combination 2 stage gas valve and pressure regulator incorporating manual shut-off, pilot valve, automatic 100 percent shut-off and thermo-couple pilot safety device, electronic spark pilot ignition, automatic vent damper, draft diverter and vent fan motor.
  - 2. Gas Burner Safety Controls: Thermo-couple sensor prevents opening of solenoid gas valve until pilot flame is proven and stops gas flow on ignition failure.
- K. Burner Operating Controls:
  - 1. Room thermostat: Cycles burner to maintain room temperature setting. Thermostat range shall be between 50 and 80 degrees. Thermostat shall be electronic type with screen layout. Provide with fan switch and adjustable heating setpoint. Thermostat shall operate with 24 volts.
  - 2. High Limit Control: Fixed stop at maximum permissible setting, deenergizes burner on high bonnet temperature and re-energizes when temperature drops to lower value.
  - 3. Fan Control: Bonnet thermostat independent of burner controls, cycles supply fan, with manual switch for continuous fan operation.
- L. Accessories:
  - 1. Concentric duct adaptor and terminations for piping inlet and exhaust vent termination specifically made for unit heaters.
- N. Acceptable Products:

		Centrifugal
1.	Reznor	UDBS
2.	Modine	HDC

- PART 3 EXECUTION
- 3.01 INSTALLATION
  - A. Install in accordance with manufacturer's instructions, and in accord to Drawings.
  - B. Install to the International Fuel Gas Code 2009 and International Mechanical Code 2009.
  - C. Controls shall be installed per Section 230900.
  - D. Mount Controls 4'-6" above floor in location shown on Drawings.
  - F. Position unit heaters with discharge across space with nozzles in position shown. Provide auxiliary steel to support unit in whatever position unit is shown.
  - G. Unit Heater Shall:
    - 1. Be piped per Section 231123.
    - 2. Be vented per manufacturer's instructions.
    - 3. Supported for auxiliary steel. Coordinate position with work of other trades and other devices.
  - K. Combustion air and furnace vent shall be routed through pipe required and sized per the furnace manufacturer. Pipes shall route through roof and be flashed with neoprene boots clamped to piping or routed through wall sleeves and sealed.

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# 3.02 PROTECTION

- A. During Construction:
  - 1. Do not use furnaces until dusty construction operations are complete. This includes drywall installation, sanding, and paint application.
  - 2. Do not operate units without filters in place.
- 3.03 OWNER INSTRUCTION AND COMMISIONING (SEE SECTION 230900)
  - A. System Operation:
    - 1. Controls and equipment which is controlled shall be fully operational and tested by the respective trades which installed the devices. Corrective work shall be performed. Contractor shall review work of all related trades. Work like energizing controls, equipment start up shall be completed. Notify equipment installers of nonfunctioning items. This shall be done prior to substantial completion.
    - 2. Contractor shall list schedule items required from the Owner so that programming can be completed. Allow a minimum of one week for the Owner to provide this schedule.
    - 3. Obtain from the Owner a list of those individuals who are authorized to provide schedules to the contractor and to receive instructions regarding system operation.
  - B. Training Material:
    - 1. Shall be O&M Manual noted above.
    - 2. Shall include troubleshooting potential problems.
    - 3. Shall include photographs or drawings of the systems as they are actually installed.
    - 4. Shall cover routine maintenance. Provide separate reproducible check lists for daily, weekly, monthly and yearly maintenance.
    - 5. Include name and telephone number of trained individual who will answer questions on the project.

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

- PART 1 GENERAL
- 1.01 SUMMARY
  - Contractor Provide Base Bid: Α.
    - 1. Labor and materials for complete electrical systems. These materials include, but are not limited to: circuit breakers, devices, boxes, conduit, conductors, connectors, fittings, and anchors, as required and indicated in these specifications and/or shown on the Electrical Drawings.
    - Power connections and control equipment and wiring as required for 2. equipment provided under other sections or by Owner.
    - 3. All minor system components reasonably required for the proper functioning and/or safe operation of the systems and to meet all related codes and ordinances.
    - 4. Required system and component testing as required in these specifications and/or related codes and ordinances.
    - Coordination with other trade contractors. 5.
    - Sleeves for raceways and cables. 6.

#### 1.02 RELATED WORK

- Α. Specified elsewhere:
  - 260519 Low-Voltage Electrical Power Conductors and Cables 1.
  - 260526 Grounding and Bonding for Electrical Systems 2.
  - 260529 Hangers and Supports for Electrical Systems 3.
  - 260533 Raceway and Boxes for Electrical Systems 4.
  - 260553 Identification for Electrical Systems 5.
  - 6.
  - 262416 Panelboards 262726 Wiring Devices 7.
  - 8. 265100 - Interior Lighting
  - 9. 265600 - Exterior Lighting
- 1.03 REFERENCES - LATEST EDITIONS
  - NFPA 70 National Electrical Code. Α.
  - B. Americans With Disabilities Act (ADA).
  - C. International Building Code (IBC).
  - D. Illinois Accessibility Code.
  - Е. Illinois Energy Conservation Code (IECC).
  - F. All other Contract Documents including Construction Drawings.
- 1.04 VERIFICATION OF POINTS
  - Before submitting his bid, Contractor shall visit the site to carefully Α. verify all exposed points of existing utilities and new connections. Contractor shall verify concealed or buried points of connection as near as possible. Verify these points, as to locations, size, type, depth, operating characteristics, and complications; including, but not limited to:
    - Present site conditions. 1.
    - Present electrical utility distribution system and requirements. 2.

- 3. Work associated with equipment provided under other sections or by Owner.
- PART 2 PRODUCTS
- 2.01 GENERAL REQUIREMENTS
  - A. Provide all information requested.
  - B. When two or more items of same material or equipment are required they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in Work, except as otherwise indicated.
  - C. Provide products compatible within systems, with interconnected systems, and with other connected items.
  - D. Provide permanent operational data nameplate on each item of power operated equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.
- 2.02 PRODUCT OPTIONS AND SUBSTITUTIONS
  - A. Options and Substitutions shall be done per the Division 1 instructions.
  - B. All product substitutions shall include any incurred costs by the Contractor, any sub-contractor, other trades, Owner, or Owner's consultants. No increase in cost or contract shall be allowed for modifications or corrections, due to approval of Contractor requested or submitted substitutions.
- 2.03 ELECTRICAL SUBMITTALS
  - A. Submit per specification section 013300.
  - B. Electrical equipment submittals shall include a clear item description not just catalog number.
  - C. Catalog pages must be clearly marked to indicate the exact product being proposed with all necessary accessories and options identified and selected.
- 2.04 DELIVERY, STORAGE AND HANDLING
  - A. Deliver products to project site with proper identification, including; names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.
  - B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.
  - C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and

equipment to the items and quantities needed for the smooth and efficient flow of installations.

- PART 3 EXECUTION
- 3.01 COORDINATION
  - A. Coordinate all work per requirements of Division 1.
  - B. See mechanical and architectural specifications, drawings, and submittals, for work concerning the connection of electrical power and any required controls.
  - C. Contractor shall verify electrical characteristics and requirements (name plate data) of equipment furnished by others (FBO) for proper coordination and equipment operation. Contractor shall confirm requirements of final equipment furnished by others (FBO) and shall select associated electrical devices accordingly. Before any work is installed, and before any equipment is purchased, The Contractor shall carefully check specifications and plans for every trade and job condition, and any lack of coordination between his work, the plans, specifications, or job conditions shall be immediately reported to the Architect/Engineer in writing.
  - D. Contractor shall coordinate equipment connection requirements with approved equipment submittals, prior to rough-in.
- 3.02 ROUGH-IN
  - A. Verify final locations and electrical characteristics for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
  - B. Refer to equipment specifications, of other divisions, for rough-in requirements.
  - C. Coordinate rough-ins for Owner provided equipment.
- 3.03 ELECTRICAL INSTALLATIONS
  - A. Comply with NECA 1.
  - B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounted items.
  - C. Coordinate electrical equipment and materials installation with other building components.
  - D. Right-of-way: Give to piping systems installed at a required slope.
  - E. Verify all dimensions by field measurements.
  - F. Arrange for chases, slots, and openings in other building components to allow for electrical installations.
  - G. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
    - Sleeves for raceways and cables: Steel pipe sleeves ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

- Grout: Nonmetallic, shrinkage-resistant, ASTM C 1107, factorypackaged nonmetallic aggregate, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
- 3. Sleeve installation for electrical penetrations:
  - a. Electrical penetrations occur when raceways, cables, and wireways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
  - b. Concrete slabs and walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
  - c. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - d. Fire-rated assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
  - e. Cut sleeves to length for mounting flush with both surfaces of walls.
  - f. Extend sleeves installed in floors 2 inches above finished floor level, unless noted otherwise.
  - g. Seal space outside of sleeves with grout for penetrations of concrete and masonry. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
  - h. Interior penetrations of non-fire-rated walls and floors shall be sealed in the annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
  - i. Fire-rated-assembly penetrations shall maintain the indicated fire rating of the walls, partitions, ceilings, or floors at point of raceway or cable penetrations, using sleeves with firestop materials.
  - j. Roof-penetration sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing unites applied in coordination with roofing work.
  - k. Above-ground, exterior wall penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
  - Underground, exterior wall penetrations: Install PVC pipe sleeves. Size sleeves for 1-inch annular clear space between sleeve and raceway or cable for installing mechanical sleeve seals.
- H. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work.
- I. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.
- J. Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.
- K. Install electrical equipment for compliance with code-required clearances and to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

- L. Provide access panels and doors for electrical items behind finished surfaces or otherwise concealed.
- M. Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment, other systems and structural components.
- N. Drawings for work under Divisions 260000 are Diagrammatic and are intended to convey scope of work and indicate general arrangement of conduit, boxes, equipment, lighting fixtures, and other work included in the contract.
  - 1. See details and schedules on drawings and specifications for meanings of abbreviations, additional requirements, and information. Check civil, architectural, structural, mechanical, and other electrical drawings for scale, space limitations, beams, door swings, windows, ductwork, coordination, and additional information, and report any discrepancies or conflicts to Architect/Engineer prior to submitting bid.
  - 2. The Contractor shall install and completely wire all equipment furnished by others (FBO) in accordance with the Manufacturer's wiring diagrams and as required for a complete operating installation. Contractor shall verify and coordinate electrical characteristics and requirements of (FBO) equipment prior to ordering associated equipment or rough-in of conduit and wiring to avoid conflicts.
- 3.04 RECORD DOCUMENTS
  - A. Provide record documents as required by this Article and Division 1 specifications.
  - B. Mark Drawings to indicate revisions to conduit size and location both exterior and interior, actual equipment locations, dimensioned to column lines, concealed equipment dimensioned to column lines, distribution and branch electrical circuitry, fuse and circuit breaker size and arrangements, support and hanger details, Change Orders, and concealed control system devices.
  - C. Accurately mark locations of underground, or under floor electrical conduits and conductors. Provide dimensions from fixed points of reference.
  - D. On-site record mark ups shall be monitored for compliance with record keeping requirements.
- 3.05 OPERATION AND MAINTENANCE DATA
  - A. Procedures and requirements for preparation and submittal of maintenance manuals shall be done as required by Division 1.
  - B. In addition to the information required by Division 1 specifications, include the following information when requested:
    - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.
    - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions.

3. Maintenance procedures for routine preventative maintenance and troubleshooting, disassembly, repair, and reassembly, aligning and adjusting instructions.

# 3.06 WARRANTIES

- A. Procedures and submittal requirements for warranties shall be done, as required by the Division 1 specifications, and as pertains to specific warranties. See individual equipment specifications for warranty requirements.
- B. Compile and assemble the warranties specified in Divisions 260000 into a file folder labeled for this project.
- C. Provide complete warranty information, for each product or equipment item, to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.
- D. Except as modified in individual specification sections:
  - 1. All materials and workmanship shall be warranted for 1 year.
  - 2. All warranties begin upon official date of substantial completion, allowing Owner's beneficial use of the work.
  - 3. Warranted materials shall be provided for replacement within 30 days of notice of failure to Contractor (or as specifically allowed by Owner's Representative).
  - 4. The first year of warranted items shall include materials and labor for replacement/repair and shall be responded to, within 10 working days of notice of problem to Contractor.
  - 5. Warranty material replacements shall not diminish Owner's stock of extra items.

## 3.07 CLEANING

- A. General requirements for final cleaning shall be done as required by Division 1.
- B. Maintain clean work space with daily cleanup of all occupied areas.

# 3.08 TESTING

- A. Provide testing and documented results as required by each specification section or applicable codes, laws, and ordinances.
- B. Provide testing and documented results as required or recommended by manufacturer(s) for certification or warranty.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.
  - 3. Conductors required for all new general power and lighting circuits required or indicated.
  - 4. Conductors required for connections to both motorized and nonmotorized equipment requiring power.

# 1.2 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

# 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field quality-control test reports.

# 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

# PART 2 - PRODUCTS

# 2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Alcan Products Corporation; Alcan Cable Division.
  - 2. American Insulated Wire Corp.; a Leviton Company.
  - 3. General Cable Corporation.
  - 4. Senator Wire & Cable Company.
  - 5. Southwire Company.
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- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.
- D. Multi-conductor Metal-Clad (MC) Cable: Not permitted except for premanufactured fixture and motorized equipment connections (not to exceed 6'-0" in length).
- E. Cables Not Allowed:
  - 1. Armored Cable (AC).
  - 2. Flat Cable Assemblies (FC).
  - 3. Flat Conductor Cable (FCC).
  - 4. Integrated Gas Spacer Cable (IGS).
  - 5. Metal-Clad Cable (MC), except as noted above.
  - 6. Mineral-Insulated, Metal-Sheathed Cable (MI).
  - 7. Nonmetallic-Sheathed Cable (NM, NMC, NMS).
  - 8. Underground Feeder Cable (UF).
  - 9. Nonmetallic Extensions.
  - 10. Concealed Knob-and-Tube.
  - 11. Open Wiring on Insulators.

### 2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Hubbell Power Systems, Inc.
  - 3. Ideal Industries, Inc.
  - 4. O-Z/Gedney; EGS Electrical Group LLC.
  - 5. 3M; Electrical Products Division.
  - 6. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- PART 3 EXECUTION
- 3.1 CONDUCTOR MATERIAL APPLICATIONS
  - A. Feeders: Copper. Stranded for all conductors.
  - B. Branch Circuits: Copper. Stranded for all conductors.
- 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
  - A. Service Entrance: Type THHN-THWN, XHHW, single conductors in raceway.
  - B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

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- C. Feeders Concealed in Ceilings and Walls, Partitions: Type THHN-THWN, single conductors in raceway.
- D. Feeders Below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- E. Exposed Branch Circuits: Type THHN-THWN, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway. Metal-clad cable is not permitted, except for light fixture connection whips and final equipment connections.
- G. Branch Circuits Below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit suspended applications.
- I. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- J. Class 2 Control Circuits: Type THHN-THWN, in raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

## 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

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- 3.5 FIELD QUALITY CONTROL
  - A. Perform tests and inspections and prepare test reports.
  - B. Tests and Inspections:
    - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - C. Test Reports: Prepare a written report to record the following:
    - 1. Test procedures used.
    - 2. Test results that comply with requirements.
    - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
  - D. Remove and replace malfunctioning materials and retest as specified above.

### 1.1 WORK INCLUDES

- A. Base Bid:
  - 1. General Contractor Shall Provide:
    - a. Installation of new remote building grounding electrodes.
    - b. Installation of new equipment grounding conductors.
    - c. Installation of new bonding conductors.
    - d. Installation of accessories to bonding and grounding connections.
- 1.2 RELATED DOCUMENTS
  - A. Drawings and other specification sections.

### 1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

### 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. All new grounding and bonding materials and equipment shall be listed by a nationally recognized testing agency (NRTL).
- PART 2 PRODUCTS

### 2.1 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

 Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

### 2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Bonding Grounding Bushings:
  - 1. Malleable iron/Steel construction for threaded Rigid Galvanized Steel or IMC Conduit.
  - 2. With bushing insulator rated for 150-degrees Celsius.
  - 3. With Mounting Set Screw.
  - 4. With Lay-In Lug and Clamping Screw.
- D. NRTL listed compression connection is acceptable.

### 2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 10' x ¾" inches in diameter.
- PART 3 EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install stranded conductors unless otherwise indicated.
- B. Grounding Conductors: Install bare tinned-copper conductor, No. 8
   AWG minimum.
   1. Clamp to ground rod.
- C. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Bolted connectors.

### 3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.

- 4. Single-phase motor and appliance branch circuits.
- 5. Flexible raceway runs.

### 3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 12 inches below final grade, unless otherwise indicated.
- C. Bonding Grounding Bushings: Furnish and install bonding bushings at each end of conduits enclosing the grounding electrode conductor indicated on the drawing.

## 3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
  - 1. After installing grounding electrode and grounding conductor, but before permanent electrical circuits have been energized, test for compliance with requirements.
  - 2. Test completed grounding system at feeder disconnect enclosure grounding terminal, and at ground rod. Make tests at ground rod before any conductors are connected.
    - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
  - 3. Prepare dimensioned drawings locating ground rod. Include the driven depth, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- B. Report measured ground resistances that exceed the following values:
  - 1. Power and Lighting Equipment or System with Capacity 500 kVA and less: 10 ohms.
- C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

- PART 1 GENERAL
- 1.1 WORK INCLUDES
  - A. Base Bid:

1. General Contractor Shall Provide:

Revise subparagraphs below to suit Project.

- a. Hangers and supports for electrical equipment and systems.
- b. Stainless steel or non-metallic materials corrosive atmosphere applications.
- 1.2 RELATED DOCUMENTS
  - A. Drawings and other specification sections.

# 1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

# 1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

## 1.5 QUALITY ASSURANCE

A. Comply with NFPA 70.

PART 2 - PRODUCTS

### 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Allied Tube & Conduit.
    - b. Cooper B-Line, Inc.; a division of Cooper Industries; Highland, IL.
    - c. ERICO International Corporation.
    - d. GS Metals Corp.
    - e. Thomas & Betts Corporation.
    - f. Unistrut; Tyco International, Ltd.
    - g. Wesanco, Inc.
  - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 3. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - 4. Channel Dimensions: Selected for applicable load criteria.
  - 5. Use stainless steel or fiberglass materials for slotted support systems in salt dome applications.
- B. Raceway Supports: As described in NECA 1 and NECA 101.
- C. Conduit Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway to be supported. Use stainless steel or non-metallic support devices in salt dome applications.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinccoated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Cooper B-Line, Inc.; a division of Cooper
      - Industries; Highland, IL.
      - 2) Empire Tool and Manufacturing Co., Inc.
      - 3) Hilti Inc.

- 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc, Glendale Heights, IL.
- 5) MKT Fastening, LLC.
- 2. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
- 3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
- 4. Toggle Bolts: All-steel springhead type.
- 5. Hanger Rods: Threaded steel.
- 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES
  - A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- PART 3 EXECUTION

## 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways to these supports with two-bolt conduit clamps, single-bolt conduit clamps, or single-bolt conduit clamps using spring friction action for retention in support channel.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

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- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To Existing Concrete: Expansion anchor fasteners.
  - 3. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

## 3.3 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean bolted connections and abraded areas, and apply galvanizing-repair paint to comply with ASTM A 780.

## 1.1 WORK INCLUDES

- A. Base Bid:
  - 1. General Contractor Shall Provide:
    - a. Installation of new junction and pull boxes, fittings, enclosures, device outlet boxes, and associated support materials, for electrical wiring.
    - b. Installation of conduit and raceways for all new electrical conductors, with associated fittings and accessories.

# 1.2 RELATED DOCUMENTS

A. Drawings and other specification sections.

## 1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquid tight flexible metal conduit.
- E. RNC/PVC: Rigid Non-metallic/poly-vinyl-chloride conduit.
- F. RMC/RGS: Rigid metallic conduit/Rigid galvanized steel.
- G. MC Cable: Metal-clad cable.

## 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

## 2.1 METAL CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Alflex Inc.
  - 3. Allied Tube & Conduit; a Tyco International Ltd. Co.; Harvey, IL.
  - 4. Anamet Electrical, Inc.; Anaconda Metal Hose; Mattoon, IL.
  - 5. Electri-Flex Co.; Roselle, IL
  - 6. O-Z Gedney; a unit of General Signal.
  - 7. Republic Conduit, Inc. West Chicago, IL
  - 8. SP Products, Inc.; Elk Grove Village, IL.
  - 9. Wheatland Tube Company, Chicago, IL.
- B. RMC: ANSI C80.1.
- C. IMC: ANSI C80.6.
- D. EMT: ANSI C80.3.
- E. FMC: Zinc-coated steel or aluminum.
- F. LFMC: Flexible steel conduit with PVC jacket.
- G. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
  - 1. Fittings for EMT: Steel compression type.

# 2.2 NONMETALLIC CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. Anamet Electrical, Inc.; Anaconda Metal Hose; Mattoon, IL.
  - 3. Arnco Corporation.
  - 4. CANTEX Inc.
  - 5. CertainTeed Corp.; Pipe & Plastics Group.
  - 6. Condux International, Inc.
  - 7. ElecSYS, Inc.
  - 8. Electri-Flex Co.; Roselle, IL
  - 9. Lamson & Sessions; Carlon Electrical Products.
  - 10. Manhattan/CDT/Cole-Flex.
  - 11. RACO; a Hubbell Company.
  - 12. Thomas & Betts Corporation.

- B. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.
- C. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

# 2.3 BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Carlon; Thomas & Betts.
  - 2. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.; Lisle, IL.
  - 3. EGS/Appleton Electric; Rosemont, IL.
  - 4. Erickson Electrical Equipment Company; Elk Grove Village, IL.
  - 5. Garvin Industries, Inc.; Chicago, IL
  - 6. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
  - 7. O-Z/Gedney; a unit of General Signal.
  - 8. RACO; a Hubbell Company.
  - 9. Robroy Industries, Inc.; Enclosure Division.
  - 10. Spring City Electrical Manufacturing Company.
  - 11. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary, Northbrook, IL.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy or aluminum, Type FD, with gasketed cover.
- D. Non-metallic Outlet and Device Boxes: PVC, Type FD, with gasketed cover.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: Rigid Non-metallic conduit (RNC).
  - 2. Concealed Conduit, Aboveground: RNC.
  - 3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried, unless otherwise specified on drawings.
  - 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
  - 5. Connection between building and adjacent wooden pole: RNC.

- B. Comply with the following indoor applications, unless otherwise indicated:
  - 1. Exposed, Not Subject to Physical Damage: RNC.
  - 2. Connection to Vibrating Equipment (Including Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFNC, except use LFNC in damp or wet locations.
  - 3. Damp or Wet Locations: RNC.
  - 4. Locations where salt, salt solutions, or other corrosive atmospheres are present: RNC.
  - 5. Raceways for Concealed General Purpose Distribution of Low-Voltage conductors: RNC.
  - 6. Boxes and Enclosures: NEMA 250, Type 4, nonmetallic in damp or wet locations.
- C. Conduits/Raceways Not Permitted:1. Electrical Nonmetallic Tubing (ENT).
- D. Minimum Raceway Size: 3/4-inch trade size, unless noted otherwise.
- E. Raceway Fittings: Compatible with raceways and suitable for use and location.

## 3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues.
- C. Complete raceway installation before starting conductor installation.
- D. Install no more than the equivalent of three 90-degree bends in any conduit run.
- E. Conceal conduit within finished walls and floors, for devices on exterior walls, unless otherwise indicated. Route exposed for interior devices and connections.
- F. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- G. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

- H. RNC conduit bends shall be done with factory fittings or with factory approved heat box, specifically intended for PVC conduit bending. Any conduit showing heat damage or reduced capacity at bends, shall be replaced.
- I. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.
  - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
  - 3. Use LFNC in locations with corrosive atmosphere.

# 3.3 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

### 1.1 WORK INCLUDES

- A. Base Bid:
  - 1. General Contractor Shall Provide:
    - a. Identification for conductors.
    - b. Warning labels and signs.
    - c. Equipment identification labels.
    - d. Miscellaneous identification products.
- 1.2 RELATED DOCUMENTS
  - Α. Drawings and other specification sections.
- 1.3 QUALITY ASSURANCE
  - Α. Comply with NFPA 70.
  - в. Comply with 29 CFR 1910.145.

#### 1.4 COORDINATION

- Coordinate identification names, abbreviations, colors, and Α. other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- Coordinate installation of identifying devices with completion в. of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.

PART 2 - PRODUCTS

- 2.1 WARNING LABELS AND SIGNS
  - A. Comply with NFPA 70 and 29 CFR 1910.145.

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- Self-Adhesive Warning Labels: Factory printed, multicolor, в. pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.
- C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch grommets in corners for mounting. Nominal size, 7 by 10 inches.
- Warning labels and signs shall include, but are not limited to, D. the following legends:
  - 1. Workspace Clearance Warning: "WARNING OSHA REGULATION -AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
  - 2. Arc-Flash Hazard Warning: "WARNING ARC FLASH HAZARD -APPROPRIATE PPE REQUIRED - FAILURE TO COMPLY CAN RESULT IN DEATH OR INJURY - REFER TO NFPA 70E"
- EQUIPMENT IDENTIFICATION LABELS 2.2
  - Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Α. Adhesive backed, with white letters on a black background. Minimum letter height shall be 3/8 inch.
- 2.3 BRANCH CIRCUIT CONDUCTOR COLOR CODE LABELS
  - A. Self-adhesive or engraved label with conductor color code information per NFPA 70 - 210.5(C). Apply to branch circuit electrical panel cover.
- 2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS
  - Α. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, selflocking, Type 6/6 nylon cable ties.
    - 1. Minimum Width: 3/16 inch.
    - 2. Tensile Strength: 50 lb, minimum.
    - Temperature Range: Minus 40 to plus 185 deg F. 3.
    - Color: Black, except where used for color-coding. 4.
  - Fasteners for Labels and Signs: Self-tapping, stainless-steel в. screws or stainless-steel machine screws with nuts and flat and lock washers.

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PART 3 - EXECUTION

#### 3.1 APPLICATION

- Power-Circuit Conductor Identification: For conductors No. Α. 1/0 AWG and larger in pull and junction boxes use color-coding conductor tape marker tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.
- Branch-Circuit Conductor Identification: Where there are в. conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.
- Equipment Identification Labels: On each unit of equipment, С. install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment.
  - 1. Labeling Instructions:
    - Indoor Equipment: Self-adhesive, engraved, laminated a. acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
  - Equipment to Be Labeled: 2.
    - a. Panelboards.
    - b. Disconnect switches.
- D. Provide warning label on panelboard for required clearance/working space.
- Wiring device circuit identification: Provide machine printed Ε. adhesive label on each wiring device cover plate, with clear background and black, minimum 1/8" high, lettering,.

#### 3.2 INSTALLATION

- Verify identity of each item before installing identification Α. products.
- Install identification materials and devices at Location: В. locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.

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- Self-Adhesive Identification Products: Clean surfaces before D. application, using materials and methods recommended by manufacturer of identification device.
- Color-Coding for Phase and Voltage Level Identification, 600 V Ε. and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
  - Color shall be factory applied or, for sizes larger than 1. No. 10 AWG if authorities having jurisdiction permit, field applied.
  - Colors for 120/240-V Circuits: 2.
    - a. Phase A: Black.
    - b. Phase B: Red.
  - Field-Applied, Color-Coding Conductor Tape: Apply in half-3. lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

- 1.1 WORK INCLUDES
  - A. Base Bid:
    - General Contractor Shall Provide: 1.
      - and removal of existing electrical a. Demolition panelboard and related materials.
      - Installation of new Lighting and appliance branchb. circuit panelboard.
- 1.2 RELATED DOCUMENTS
  - Α. Drawings and other specification sections.
- 1.3 SUBMITTALS
  - Α. Product Data: For each type of panelboard, switching and overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
  - Shop Drawings: For panelboard 'A' and related equipment. В.
    - Include dimensioned plans, elevations, sections, 1. and details. Show tabulations of installed devices, equipment features, and ratings.
    - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
    - Detail bus configuration, current, and voltage ratings. 3.
    - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
    - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
    - Include wiring diagrams for power, signal, and control 6. wiring.
  - С. Panelboard Circuit Directories: For installation in panelboards. Submit final versions after load balancing.
  - D. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals.

- 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
- 2. Time-current curves, including selectable ranges for each of overcurrent protective device tvpe that allows adjustments.
- 1.4 QUALITY ASSURANCE
  - Source Limitations: Obtain panelboards, overcurrent protective Α. devices, components, and accessories from single source from single manufacturer.
  - в. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  - C. Comply with NEMA PB 1.
  - D. Comply with NFPA 70.
- DELIVERY, STORAGE, AND HANDLING 1.5
  - Remove loose packing and flammable materials from inside Α. panelboards.
  - В. Handle and prepare panelboards for installation according to NECA 407 and NEMA PB 1.
- 1.6 PROJECT CONDITIONS
  - Environmental Limitations: Α.
    - Rate equipment for continuous operation under the following 1. conditions unless otherwise indicated:
      - Ambient Temperature: Not exceeding plus 104 deg F. a.
  - Service Conditions: NEMA PB 1, usual service conditions, as в. follows:
    - 1. Ambient temperatures within limits specified.
    - 2. Altitude not exceeding 6600 feet.
  - Interruption of Existing Electric Service: Do not interrupt C. electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

- Notify Architect and Owner's representative no fewer than 1. two weeks in advance of proposed interruption of electric service.
- Do not proceed with interruption of electric service 2. without the Architect and Owner's written permission.
- 3. Comply with NFPA 70E.

#### 1.7 COORDINATION

- Coordinate the demolition, layout, and installation of panelboards and components with other construction that Α. penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- PART 2 PRODUCTS

#### 2.1 GENERAL REQUIREMENTS FOR PANELBOARD

- Enclosure: Surface-mounted cabinet. Α.
  - 1. NEMA 4X enclosure.
  - 2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
  - 3. Directory Card: Inside panelboard door, mounted in transparent card holder.
  - Keys: Two for panelboard cabinet lock. 4.
  - 5. Circuit Breakers: Reference panel schedule for breaker quantities and ratings.
- Incoming Mains Location: Bottom. в.
- Phase, Neutral, and Ground Buses: С.
  - Material: Hard-drawn copper, 98 percent conductivity. 1.
  - 2. Equipment Ground Bus: Adequate for feeder and branchcircuit equipment grounding conductors; bonded to box.
- Conductor Connectors: Suitable for use with conductor material D. and sizes.
  - 1. Material: Hard-drawn copper, 98 percent conductivity.
  - 2. Main and Neutral Lugs: Mechanical type.
  - 3. Ground Lugs and Bus-Configured Terminators: Mechanical type.

- Service Equipment Label: NRTL labeled for use as service Ε. equipment.
- Future Devices: Mounting brackets, bus connections, filler F. plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: 10,000 amperes, symmetrical to match existing panel.
- 2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARD
  - Manufacturers: Subject to compliance with requirements, provide Α. products by one of the following:
    - 1. Eaton Culter Hammer; Glendale Heights, IL
    - 2. GE
    - 3. Siemens
    - Square D; Schneider Electric; Palatine, IL. 4.
  - Panelboards: NEMA PB 1: в. 1. Lighting and appliance branch-circuit type.
  - Mains: 100 amp bus, 60 amp/2 pole breaker. C.
  - Branch Overcurrent Protective Devices: Plug-on or bolt-down D. circuit breakers, replaceable without disturbing adjacent units.
  - Doors: Concealed hinges; secured with flush latch with tumbler Ε. lock. Constructed for NEMA 4X enclosure rating.
- 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES
  - Α. Manufacturers: Match to panel board:
  - Molded-Case Circuit Breaker (MCCB): Listed with a NRTL, with Β. interrupting capacity to meet listed fault current. Reference drawings E200 and E300 for panel schedule and additional information.
    - Thermal-Magnetic Circuit Breakers: Inverse time-current 1. element for low-level overloads, and instantaneous magnetic trip element for short circuits.
    - 2. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
      - a. Standard frame sizes, trip ratings, and number of poles.
      - Mechanical style, suitable for number, size, b. Luas: trip ratings, and conductor materials.

- Undervoltage Trip: Set to operate at 35 to 75 percent c. of rated voltage without intentional time delay.
- d. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- Receive, inspect, handle, and store panelboard according to Α. NECA 407 and NEMA PB 1.1.
- Examine panelboards before installation. Reject panelboards В. that are damaged or rusted or have been subjected to water saturation.
- Examine elements and surfaces to receive panelboard for С. compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- Install panelboard and accessories according to NECA 407 and Α. NEMA PB 1.1.
- Mount top of branch panel trim a maximum of 72 inches above в. finished floor unless otherwise indicated.
- С. Mount panelboard cabinet plumb and rigid without distortion of box.
- Install overcurrent protective devices and controllers not D. already factory installed.
- Install filler plates in unused spaces. Ε.
- Arrange conductors in gutters into groups and bundle and wrap F. with wire ties after completing load balancing. The ungrounded and grounded circuit conductors of each multi-wire branch circuit shall be grouped by cable ties or similar means in at least one location within the panelboard or other point of origination.
- G. Comply with NECA 1.

#### 3.3 IDENTIFICATION

- Identify field-installed conductors, interconnecting wiring, and Α. components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."
- Create a directory to indicate installed circuit loads after в. balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable. Directory must meet requirements of NEC 408.4. Drawing panel schedules are generally not intended to be substitutes for the final panel circuit directories.
- Panelboard Nameplates: Label panelboard with a nameplate С. complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- 3.4 FIELD QUALITY CONTROL
  - Α. Perform tests and inspections.
  - Acceptance Testing Preparation: в. Test continuity of each circuit. 1.
  - Tests and Inspections: C.
    - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
    - Correct malfunctioning units on-site, where possible, and 2. retest to demonstrate compliance; otherwise, replace with new units and retest.
  - D. Panelboards will be considered defective if they do not pass tests and inspections.

#### 3.5 ADJUSTING

- Adjust moving parts and operable component to function smoothly, Α. and lubricate as recommended by manufacturer.
- Load Balancing: After Substantial Completion, but not more than в. 60 days after Final Acceptance, measure load balancing and make circuit changes.
  - 1. Measure as directed during period of normal system loading.

- 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed.
- 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
- Tolerance: Difference exceeding 20 percent between phase 4. loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

- 1.1 WORK INCLUDES
  - Base Bid: Α.
    - 1. General Contractor Shall Provide:
      - a. Specification Grade receptacles, receptacles with integral GFCI, toggle switches, and associated device plates.
- 1.2 RELATED DOCUMENTS
  - A. Drawings and other specification sections.
- 1.3 DEFINITIONS
  - A. EMI: Electromagnetic interference.
  - в. GFCI: Ground-fault circuit interrupter.
  - Piqtail: Short lead used to connect a device to a branch-С. circuit conductor.
  - D. RFI: Radio-frequency interference.
  - E. PIR: Passive Infrared

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- Field quality-control test reports. в.
- Operation and Maintenance Data: For wiring devices to include С. in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

#### 1.5 QUALITY ASSURANCE

Source Limitations: Obtain each type of wiring device and Α. associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

- Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a NRTL, and в. marked for intended use.
- C. Comply with NFPA 70.
- 1.6 COORDINATION
  - A. Receptacles for existing equipment or equipment provided under other sections: Match plug configurations.
- PART 2 PRODUCTS
- 2.1 STRAIGHT BLADE RECEPTACLES
  - Convenience Receptacles, heavy-duty, specification grade, 125 V, Α. 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R.
  - Manufacturers: В.
    - 1. Cooper-Eaton: #5362
    - 2. Hubbell: #5362
    - 3. Legrand-Pass & Seymour: #5362

#### 2.2 GFCI RECEPTACLES

- General Description: Straight blade, feed-through type. Comply Α. with NEMA WD 1, NEMA WD 6, Class A, and include indicator light that is lighted when device is tripped.
- в. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
- C. Manufacturers:
  - 1. Cooper-Eaton: #WRVGF20
  - 2. Hubbell: #GFR5362
  - 3. Legrand-Pass & Seymour: #PT2095HG

#### 2.3 TOGGLE SWITCHES

- Heavy-Duty, specification grade, 1-pole and 3-way toggle switch, Α. 277 V, 20 A: Compy with NEMA WD 1, NEMA WD 6.
- в. Manufacturers:
  - 1. Cooper-Eaton: 1-pole #AH1221; 3-way #AH1223
  - 2. Hubbell: 1-pole #1221; 3-way #1223
  - 3. Legrand Pass & Seymour: 1-pole #PS20AC; 3-way #PS20AC3

#### 2.4 WALL PLATES

- Single and combination types to match corresponding wiring Α. devices.
  - 1. Plate-Securing Screws: Metal with head color to match plate finish.
  - 2. Material for Unfinished Spaces: Galvanized steel.
  - Weatherproof receptacle applications: Cast aluminum or 3. non-metallic 'while-in-use' lift cover, and listed and labeled for use in "wet locations." The outlet box hood installed shall be identified as "Extra Duty" and be in accordance with the National Electrical Code NFPA 70 Article 406.9(B)(1).
  - Weatherproof switch applications on metal box: Cast 4. aluminum with lever type external handle operator and perimeter gasket. The outlet box hood installed shall be identified as "Extra Duty" and be in accordance with the National Electrical Code NFPA 70 Article 404.4(A).
  - Weatherproof switch applications on non-metallic box: PVC 5. with lever type external handle operator and perimeter gasket. The outlet box hood installed shall be identified as "Extra Duty" and be in accordance with the National Electrical Code NFPA 70 Article 404.4(A).

### PART 3 - EXECUTION

# 3.1 INSTALLATION

- Α. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- Coordination with Other Trades: в.
  - 1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
- Conductors: C.
  - Do not strip insulation from conductors until just before 1. they are spliced or terminated on devices.
  - Strip insulation evenly around the conductor using tools 2. designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
  - The length of free conductors at outlets for devices shall 3. meet provisions of NFPA 70, Article 300, without pigtails.
  - 4. Existing Conductors:
    - a. Cut back and pigtail, or replace all damaged conductors.
    - b. Straighten conductors that remain and remove corrosion and foreign matter.

- Pigtailing existing conductors is permitted provided c. the outlet box is large enough.
- Device Installation: D.
  - 1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
  - Keep each wiring device in its package or otherwise 2. protected until it is time to connect conductors.
  - Do not remove surface protection, such as plastic film and 3. smudge covers, until the last possible moment.
  - Connect devices to branch circuits using pigtails that are 4. not less than 6 inches in length.
  - When there is a choice, use side wiring with binding-head 5. screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
  - Use a torque screwdriver when a torque is recommended or 6. required by the manufacturer.
  - When conductors larger than No. 12 AWG are installed on 15-7. or 20-A circuits, splice No. 12 AWG pigtails for device connections.
  - Tighten unused terminal screws on the device. 8.
  - When mounting into metal boxes, remove the fiber or plastic 9. washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- Ε. Receptacle Orientation:
  - Install ground pin of vertically mounted receptacles up, 1. and on horizontally mounted receptacles to the right.
- F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical.
- 3.2 IDENTIFICATION
  - A. Comply with Division 26 Section "Identification for Electrical Systems."
- 3.3 FIELD QUALITY CONTROL
  - Perform tests and inspections and prepare test reports. Α.
    - Test Instrument for Convenience Receptacles: 1. Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
  - Tests for Convenience Receptacles: в.
    - 1. Line Voltage: Acceptable range is 105 to 132 V.
    - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
    - 3. Ground Impedance: Values of up to 2 ohms are acceptable.

- GFCI Trip: Test for tripping values of 5mA. 4.
- 5. Using the test plug, verify that the device and its outlet box are securely mounted.
- The tests shall be diagnostic, indicating damaged б. conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

### 1.1 WORK INCLUDES

A. Base Bid:1. General Contractor Shall Provide:a. Non-fusible switches.

# 1.2 RELATED DOCUMENTS

A. Drawings and other specification sections.

## 1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.

## 1.4 SUBMITTALS

- A. Shop Drawings: For enclosed switches. Include plans, elevations, sections, details, and attachments to other work.
- B. Operation and Maintenance Data: For enclosed switches to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Manufacturer's written instructions for testing and adjusting enclosed.

### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NFPA 70.

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#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
  - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
  - 2. Altitude: Not exceeding 6600 feet.

#### 1.7 COORDINATION

Coordinate layout and installation of switches and components Α. with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

### PART 2 - PRODUCTS

#### 2.1 NONFUSIBLE SWITCHES

- Manufacturers: Subject to compliance with requirements, provide Α. products by one of the following:
  - 1. Eaton Culter Hammer
  - 2. GE
  - 3. Siemens
  - Square D; Schneider Electric; Palatine, IL. 4.
- Type HD, Heavy Duty, Single Throw, 240-V ac, 30A, horsepower в. rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Lugs: Mechanical type, suitable for number, size, and conductor material.

# 2.2

#### 2.3 ENCLOSURES

Enclosed Switches: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, Α. to comply with environmental conditions at installed location. 1. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

# 3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 INSTALLATION

- A. Install individual wall-mounted switches with tops at uniform height (maximum 72") unless otherwise indicated.
- B. Comply with NECA 1.

## 3.3 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."
  - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
  - 2. Label each enclosure with engraved laminated-plastic nameplate.
- 3.4 FIELD QUALITY CONTROL
  - A. Acceptance Testing Preparation:1. Test continuity of each circuit.
  - B. Tests and Inspections:
    - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
    - Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
    - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

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# 3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

- 1.1 WORK INCLUDES
  - A. Base Bid:
    - 1. General Contractor Shall Provide:
      - a. Interior LED lighting fixtures and light engines/drivers.
      - b. Lighting fixture supports.
- 1.2 RELATED DOCUMENTS
  - A. Drawings and other specification sections.

#### 1.3 DEFINITIONS

- Α. .
- B. CRI: Color-rendering index.
- C. CU: Coefficient of utilization.
- D. LER: Luminaire efficacy rating.
- Ε. Luminaire: Complete lighting fixture, including driver housing, if provided.

#### 1.4 SUBMITTALS

- Product Data: For each type of lighting fixture, arranged in Α. order of fixture designation. Include data on features, accessories, finishes, and the following:
  - 1. Physical description of lighting fixture including dimensions.
  - 2. Driver/light engine.
  - Energy-efficiency data (lumens/watt for LED fixtures). 3.
  - 4. Life, output, and energy-efficiency data for light engines.
  - Internet links to Photometric data, in IESNA format, based 5. on laboratory tests of each lighting fixture type and accessories identical to those indicated for the lighting fixture as applied in this Project.
    - For indicated fixtures, photometric data shall be a. certified by a qualified independent testing agency.
Photometric data for remaining fixtures shall be certified by the manufacturer.

- b. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.
- Operation and Maintenance Data: For lighting equipment and в. fixtures to include in emergency, operation, and maintenance manuals.
- C. Warranties: Special warranties specified in this Section.

#### 1.5 QUALITY ASSURANCE

- Luminaire Photometric Data Testing Laboratory Qualifications: Α. Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- Luminaire Photometric Data Testing Laboratory Qualifications: в. Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.
- Electrical Components, Devices, and Accessories: Listed and С. labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NFPA 70.

#### 1.6 COORDINATION

A. Coordinate layout and installation of lighting fixtures with other construction, including equipment, and partition assemblies.

### 1.7 WARRANTY

- Special Warranty for LED fixtures: Manufacturer's standard form Α. in which fixture manufacturer agrees to repair or replace fixtures failing in materials or workmanship within specified warranty period (Five years from date of Substantial Completion).
- Special Warranty for Electronic Drivers: Manufacturer's в. standard form in which LED driver manufacturer agrees to repair or replace units that fail in materials or workmanship within

specified warranty period (Five years from date of Substantial Completion).

PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. As defined in lighting fixture schedule, on drawings.
- 2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS
  - A. Metal Parts: Free of burrs and sharp corners and edges.
  - Sheet Metal Components: Steel, unless otherwise indicated. в. Form and support to prevent warping and sagging.
  - Doors, Frames, and Other Internal Access: Smooth operating, С. free of light leakage under operating conditions, and designed to permit opening without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during maintenance and when secured in operating position.
  - D. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
    - 1. White Surfaces: 85 percent.
  - E. Plastic Diffusers:
    - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation, impact restistant.
      - a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
      - b. UV stabilized.
    - 2. Polycarbonate diffusers:
      - a. UV stabilized to prevent yellowing and brittleness.

### 2.3 LED FIXTURES

- A. Minimum lumen output rating listed in fixture schedule descriptions.
- B. Maximum input wattage listed in fixture schedule descriptions.

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- C. Fixture data shall be produced in compliance with IESNA LM70.
- D. Color temperature range indicated in fixture schedule descriptions; minimum 70 CRI rating.
- E. Electronic driver with surge protection circuitry and universal input voltage (120-277 volts ac).

PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with walls.
- Connect wiring according to Division 26 Section "Low-Voltage в. Electrical Power Conductors and Cables."

END OF SECTION 265100

PART 1 - GENERAL

#### 1.1 WORK INCLUDES

- A. Base Bid:
  - 1. General Contractor Shall Provide:
    - a. Exterior LED luminaires with light engines and electronic drivers.
    - b. Luminaire-mounted photoelectric relays.
- 1.2 RELATED DOCUMENTS
  - A. Drawings and other specification sections.

#### 1.3 DEFINITIONS

- Α. CRI: Color-rendering index.
- B. HID: High-intensity discharge.
- C. Luminaire: Complete lighting fixture.
- 1.4 SUBMITTALS
  - Product Data: For each luminaire and support component, Α. arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:
    - 1. Physical description of luminaire, including materials, dimensions, and verification of indicated parameters.
    - 2. Details of attaching luminaires and accessories.
    - 3. Details of installation and construction.
    - 4. Luminaire materials.
    - 5. Photometric data based on laboratory tests of each luminaire type, complete with indicated and accessories.
      - For indicated luminaires, photometric data shall be a. certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
      - Photometric data shall be certified by manufacturer's b. laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

- 6. Photoelectric relays.
- 7. Fixture data including: life, output, and energy-efficiency data.
- 8. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
- в. Operation and Maintenance Data: For luminaires to include in emergency, operation, and maintenance manuals.
- C. Warranty: Special warranty specified in this Section.

#### 1.5 OUALITY ASSURANCE

- Luminaire Photometric Data Testing Laboratory Qualifications: Α. Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- Luminaire Photometric Data Testing Laboratory Qualifications: в. Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.
- Electrical Components, Devices, and Accessories: Listed and С. labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- Comply with IEEE C2, "National Electrical Safety Code." D.
- Comply with NFPA 70. Е.

#### 1.6 WARRANTY

- Special Warranty: Manufacturer's standard form in which Α. manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
  - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
  - 2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
  - 3. Warranty Period for Color Retention: Five years from date of Substantial Completion.

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#### 1.7 MANUFACTURERS

A. As defined in Luminaire Schedule, on drawing Sheet E-1.

#### 1.8 LUMINAIRES, GENERAL REQUIREMENTS

- A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
- Comply with IESNA RP-8 for parameters of lateral light в. distribution patterns indicated for luminaires.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- Sheet Metal Components: Corrosion-resistant aluminum, unless D. otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Cast aluminum, weather- and light-tight enclosures that will not warp, sag, or deform in use.
- Doors, Frames, and Other Internal Access: Smooth operating, F. free of light leakage under operating conditions, and designed to open without use of special tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during opening and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.
- G. Exposed Hardware Material: Stainless steel.
- Plastic Parts: High resistance to yellowing and other changes н. due to aging, exposure to heat, and UV radiation.
- Lenses and Refractors Gaskets: Use heat- and aging-resistant I. resilient gaskets to seal and cushion lenses and refractors in luminaire doors.
- J. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping.
- Factory-Applied Finish for Aluminum Luminaires: Comply with к. NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  - 1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

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- 2. Class I, Color Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: medium satin; 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.
  - a. Color: Dark bronze.
- 3. Minimum Starting Temperature: Minus 40 deg F.

### PART 2 - EXECUTION

- 2.1 LUMINAIRE INSTALLATION
  - A. Install lamps in each luminaire.
  - Fasten luminaire to indicated structural supports. в.
  - C. Adjust luminaires that require field adjustment or aiming.
- 2.2 CORROSION PREVENTION
  - Α. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- 2.3 GROUNDING
  - A. Attach associated branch circuit equipment grounding conductor to fixture ground screw.

### 2.4 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- Illumination Observations: Verify normal operation of lighting в. units after installing luminaires and energizing circuits with normal power source.
  - 1. Verify operation of photoelectric controls.

### END OF SECTION 265600

SECTION 312000 - EARTH MOVING

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.
- B. See Civil Drawings for earth moving requirements for the site (i.e., approximately five feet outside of the building footprint).

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Preparing subgrades for slabs-on-grade.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Drainage course for concrete slabs-on-grade.
  - 4. Excavating and backfilling trenches for utilities and pits for buried utility structures within building limits.
  - 5. Testing
- B. Related Sections:
  - 1. Section 015000 "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
  - 2. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
  - 3. Divisions 21, 22, 23, 26, 27, 28, and 33 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

#### 1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

- D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
  - 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
  - 2. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
  - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m)for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
  - 1. Excavation of Footings, Trenches, and Pits: Late-model, trackmounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom; measured according to SAE J-1179.
  - Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other manmade stationary features constructed above or below the ground surface.
- I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
  - 1. Classification according to ASTM D 2487.
  - 2. Laboratory compaction curve according to ASTM D 698.

#### 1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

#### 1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
  - Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 015000 "Temporary Facilities and Controls," and Section 311000 "Site Clearing," are in place.
- D. Do not commence earth moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.
- E. The following practices are prohibited within protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Parking vehicles or equipment.
  - 3. Foot traffic.
  - 4. Erection of sheds or structures.
  - 5. Impoundment of water.
  - 6. Excavation or other digging unless otherwise indicated.
  - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
  - 1. Liquid Limit: 50 or less.
  - 2. Plasticity Index: 25 or less.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
  - Unsatisfactory soils also include satisfactory soils not maintained within -2 and +3 percentage points of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- G. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- H. Sand: ASTM C 33; fine aggregate.
- I. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

#### 2.2 CONTROLLED LOW-STRENGTH MATERIAL

- A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:
  - 1. Portland Cement: ASTM C 150, Type I.

- 2. Fly Ash: ASTM C 618, Class C or F.
- Normal-Weight Aggregate: ASTM C 33, 3/4-inch (19-mm) nominal maximum aggregate size.
- 4. Water: ASTM C 94/C 94M.
- 5. Air-Entraining Admixture: ASTM C 260.
- B. Produce conventional-weight, controlled low-strength material with 140-psi (965-kPa)compressive strength when tested according to ASTM C 495.

#### 2.3 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
  - 1. Red: Electric.
  - 2. Yellow: Gas, oil, steam, and dangerous materials.
  - 3. Orange: Telephone and other communications.
  - 4. Blue: Water systems.
  - 5. Green: Sewer systems.

#### 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 earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

#### 3.2 DEWATERING

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

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

### 3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

#### 3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
  - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
    - a. 24 inches (600 mm) outside of concrete forms other than at footings.
    - b. 12 inches (300 mm) outside of concrete forms at footings.
    - c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
    - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    - e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
    - f. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.
- B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
  - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
    - a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

- Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
  - a. 24 inches (600 mm) outside of concrete forms other than at footings.
  - b. 12 inches (300 mm) outside of concrete forms at footings.
  - c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
  - d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
  - e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
  - f. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

#### 3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
  - Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

#### 3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
  - 1. Clearance: 12 inches (300 mm) each side of pipe or conduit.

- C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
  - Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

#### 3.7 SUBGRADE INSPECTION

- A. Notify Architect and Owner's Representative when excavations have reached required subgrade.
- B. If Owner's Representative determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 25 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
  - Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
  - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for, via Change Order, according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

#### 3.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi (17.2 MPa), may be used when approved by Architect.
  - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

#### 3.9 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

#### 3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
  - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for Record Documents.
  - 3. Testing and inspecting underground utilities.
  - 4. Removing concrete formwork.
  - 5. Removing trash and debris.
  - 6. Removing temporary shoring and bracing, and sheeting.
  - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.
- 3.11 UTILITY TRENCH BACKFILL
  - A. Place backfill on subgrades free of mud, frost, snow, or ice.
  - B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
  - C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete"
  - D. Backfill voids with satisfactory soil while removing shoring and bracing.
  - E. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
    - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
  - F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.
  - G. Place and compact final backfill of satisfactory soil to final subgrade elevation.

- H. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.
- I. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.
- 3.12 SOIL FILL
  - A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
  - B. Place and compact fill material in layers to required elevations as follows:
    1. Under steps and ramps, use engineered fill.
    2. Under building slabs, use engineered fill.
    - 3. Under footings and foundations, use engineered fill.
  - C. Under footings and foundations, use select granular fill, see following paragraph "COMPACTION OF SOIL BACKFILLS AND FILLS."
- 3.13 SOIL MOISTURE CONTROL
  - A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
    - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
    - Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.
- 3.14 COMPACTION OF SOIL BACKFILLS AND FILLS
  - A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
  - B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
  - C. Beneath footings, if weaker soil deposits are exposed at the design bearing elevation or are within a depth equivalent to the foundation width below the bearing elevation, they are to be removed and replaced with select granular fill.
    - 1. The width of foundation undercuts should exceed footing dimensions by at least 6 inches along each side for every foot of

overdig as measured at the base of the excavation. Replacement material should consist of crushed limestone having a maximum size of 3 inches and a minimum size of 1/4 inch and containing no fines. Illinois Department of Transportation (IDOT) gradation specifications for CA-1, CA-3, CA-5 and CA-7 meet these criteria. The structural fill should be spread in 12 inch layers loose thickness with each layer densified using vibratory compaction equipment. Each lift of should be observed and tested.

- D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - Under structures and building slabs, , scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 97 percent.
  - 2. For utility trenches, compact each layer of initial and final backfill soil material at 97 percent.

#### 3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
  - 1. Provide a smooth transition between adjacent existing grades and new grades.
  - Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.
- 3.16 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE
  - A. Place drainage course on subgrades free of mud, frost, snow, or ice.
  - B. On prepared subgrade, place and compact drainage course under cast-inplace concrete slabs-on-grade as follows:
    - 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
    - 2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
    - 3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
    - Compact each layer of drainage course to required cross sections and thicknesses with a minimum of two passes of a plate-type vibratory compactor.

#### 3.17 FIELD QUALITY CONTROL

- A. Special Inspections: Engage and pay for a qualified special inspector to perform the following special inspections:
  - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
  - 2. Determine that fill material and maximum lift thickness comply with requirements.
  - 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities, in addition to the tests below. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect. Additional tests will be performed at the following locations and frequencies:

  Isolated Spread Footings: At least one test for every location.
  - Continuous Wall Footings: at least on test for every 20 feet or less of wall length, but no fewer than two tests.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
  - Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 20 feet or less of wall length, but no fewer than two tests.
  - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 100 feet (46 m) or less of trench length, but no fewer than two tests.
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

#### 3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

- 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.
- D. Comply with requirements of Storm Water Pollution Prevention Plan (SWPPP).
- 3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS
  - A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

# Peoria Zoo Takin Enclosure Glen Oak Park 2218 N. Prospect Rd. Peoria, IL 61603

OWNER PROJECT #15-011 A/E PROJECT #2015904.00

DATE: 29 September 2015

Owner:

Peoria Park District 1125 West Lake Peoria, Illinois 61614

## Civil Engineer

Mohr and Kerr Engineering and Land Surveying 5901 N. Prospect, Suite 6B Peoria, Illinois 61614 Ph. 309.692.8500 Fax 309.692.8501

## Architect/Mechanical/Engineer:

apaceDesign architects + engineers 2112 E. War Memorial Drive Peoria, Illinois 61614 Ph. 309.685.4722 Fax 309.685.4784

## Structural Consultant:

Hanson Professional Services Inc. 7625 N. University St., Ste. 200 Peoria, Illinois 61614 Ph. 309.691.0902 Fax. 309.691.1327

## **Electrical Engineer:**

Keith Engineering Design Inc. 208 S. First Avenue Morton, IL 61550 Ph. 309.938.4005 Fax.309.263.5657

## INDEX OF DRAWINGS:

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PEORIA ZOO -

EXPIRES 11.30.16 A-SHEETS ONLY

## Location in State

## Location in City

NO SCALE

THOMAS N. DEJARLD 81-4730

> EXPIRES 11.30.16 S-SHEETS ONLY



EXPIRES 11.30.15 P, H SHEETS ONLY



EXPIRES 11.30.15 E SHEETS ONLY

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BBREVIA	<b>Bidding</b>	Dc	ocuments	architects 2112 East War Memorial Drive endirects Peoria Illinois 61614	designers t:309.685.4722 f:309.685.4784 www.apaceDesign.com	exclusive property of apaceDesign n only be used with the express itects + Engineers. Furthermore, copied (either mechanically or art, without the express written gn Architects + Engineers.	,
A T.F. UM PROX CH NG. KNG DG D. 2. X. NG R	AMERICANS WITH DISABILITIES ACT ABOVE FINISHED FLOOR ALTERNATE ALUMINUM APPROXIMATE ARCHITECT (URAL) BEARING BLOCKING BOARD BUILDING BY OWNER CENTER LINE CENTER LINE CENTER TO CENTER CLASSROOM CEILING CLEAR (ANCE)	MANUF MAS. MAX M.B. MECH MISC MIN MISC MTL OR MET MNTD. NO NIC OC OPNG OPP OD	MANUFACTURE (R) MASONRY MAXIMUM MARKERBOARD MECHANICAL MISCELLANEOUS MINIMUM MISCELLANEOUS METAL MOUNTED NUMBER NOT IN CONTRACT ON CENTER OPENING OPPOSITE OUTSIDE DIAMETER	apaceDesign		These Bidding Documents are the Architects + Engineers; and ca permission of apaceDesign Arch these documents cannot be o electronically), in whole or in p permission of apaceDesig	
U L(S) MP NC NSTR NT ORD. T. J MO T A AG M S EC OR ELEV(S) UIP IST OR EX TER S M.A. C. I R(NG) P G LV P T RIZ. I T SUL	CONCRETE MASONRY UNIT COLUMN(S) COMPRESS (IBLE), COMPACTED CONCRETE CONSTRUCTION CONTINUOUS COORDINATE CARPET CERAMIC TILE DOUBLE DEEP DEMOLITION DETAIL DIAMETER DIAGONAL DIMENSION DOOR (S) DOWNSPOUT EACH EXTERIOR INSULATION FINISH SYSTEM ELECTRICAL ELEVATION (S) EQUAL EQUIPMENT EXISTING EXTERIOR FACE BRICK FILE DRAWER, FLOOR DRAIN FOUNDATION FEDERAL EMERGENCY MANAGEMENT ASSOCIATION FINISH (ED) FLOOR (ING) FIBERGLASS REINFORCED PANEL FOOTING GAUGE GALVANIZED GYPSUM HIGH HEIGHT HOUR HORIZONTAL HOLLOW METAL JOINT INSULATION LENGTH LINEAR FEET CONCRETE	O.S.B. P.LAM PLUMB. PLYWD PNT. OR PT P.C. RAD REINF REQ'D REF RB RM R.T.U. SCHED SLNT SF SHT SIM S.C.WD SPEC SQ S.STL STL S.A.T. STOR SIM STRUCT SUSP N T T+G T.B. T.B.R. THK TO TYP UON. VB VCT VERT VEST. WC. WWF W. W/ WIN (S) W/O WD ROUG	UNITED STRAND BOARD PLASTIC LAMINATE PLUMBING PLYWOOD PAINT PORTLAND CEMENT RADUS REINFORCE (D), (ING) REQUIRED REFERENCE RESILIENT BASE ROOM ROOF TOP UNIT SCHEDULE (D) SEALANT SOUARE FFET SIMILAR SOLID CORE WOOD SPECIFICATION (S) SOUARE STAINLESS STEEL STEEL SUSPENDED ACOUSTICAL TILE CEILING STORAGE SIMILAR STRUCTURAL SUSPENDED TALL TONGUE AND GROOVE TACKBOARD TO BE REMOVED THICK (NESS) TOP OF TYPICAL UNLESS OTHERWISE NOTED VINYL COMPOSITION TILE VESTIBULE WALL COVERING WELDED WIRE FABRIC WIDTH WITH WITH WITHOUT WOOD	itle Sheet	ew Takin Enclosure	eoria Zoo eoria Park District	eoria, il o'ious
	SAND OR GROUT		H WOOD (CONTINUOUS) RETE MASONRY UNITS (CMU)		Ž	<u> </u>	ב 
	INSULATION (RIGID) OR	(XX) FACE	BRICK	NO. 1 Biddir	ng Docur	DAT	<sup>™</sup> 15 
	AL NOTES						
ALL ITEMS IN ALL DIMENSIO CONTRACTOR CONTRACTOR ALL WORK O AS CITY OF F WORK SHALL CONTRACTOR REQUIRED B THESE DRAV CONTRACTOR AND COMPLIC CONTRACTOR ALL REFUSE ALL NEW CO RESPONSIBL STORAGE OF CONTRACTOR THROUGHOU ALL MANUFA ALL MANUFA ALL MATERIA	DICATED IN THIS SET OF DRAWINGS ARE CONTRACTOR ONS ARE TO FINISHED FACE OF WALL, UNLESS OTHERW R SHALL VERIFY ALL EXISTING CONDITIONS, PRIOR TO S R SHALL CAREFULLY COORDINATE ALL WORK OF ALL TR F THE PROJECT SHALL BE PROVIDED IN COMPLETE ACC PEORIA AND PEORIA COUNTY CODES AND ORDINANCES; MEET THE REQUIREMENTS OF THE STATE OF ILLINOIS OR SHALL BE RESPONSIBLE FOR ALL REQUIRED PERMITS Y GOVERNMENT AGENCIES AND UTILITIES. WINGS ARE NOT INTENDED TO DEPICT EACH AND EVERY OR IS IN THE BEST POSITION TO VERIFY THAT ALL CONDI ETE FACILITY. THE CONTRACTOR SHALL DO SO. OR SHALL CLEAN ENTIRE SITE ON A DAILY BASIS; AND SH MATERIALS SHALL BE PROPERLY AND LAWFULLY DISPON NSTRUCTION SHALL BE FULLY PROTECTED FROM ANY A E FOR FULL REPAIR TO ORIGINAL CONDITION, OF ANY S MATERIALS AND SUPPLIES, AND ANY POSSIBLY HAZAR OR AND SITE SUPERINTENDENT SHALL BE ACCESSIBLE B JT THE DURATION OF THE PROJECT. CTURERS, PRODUCTS, AND SYSTEMS SPECIFIED SHALL ALS, PRODUCTS, AND SYSTEMS TO BE INSTALLED PER M SPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL DIMI ION CONTAINED WITHIN THIS SET OF DOCUMENTS. LAYO ASTRUCTION BEGINS. ARCHITECT SHALL BE NOTIFIED IN	PROVIDED, UNLES ISE INDICATED. UBMITTING A BID. ADES, AND WORK ORDANCE WITH T AND SHALL BE CA PLUMBING CODE A S AND FEES; INCLU DETAIL OF THE PI TIONS ARE COMPI ALL ENDEAVOR TO SED OF OFF-SITE ND ALL DAMAGE. UCH CONSTRUCTI DOUS MATERIALS Y CELLPHONE DUI BE USED UNLESS ANUFACTURERS I ENSIONS AND COM DUT OF ALL NEW O IMEDIATELY IF FIE	SS SPECIFICALLY STATED OTHERWISE. BY SUBCONSULTANTS OF THE OWNER AND WORK OF THE OWNER. HE 2006 IBC FAMILY OF CODES; AS WELL AREFULLY COORDINATED. ALL PLUMBING AND THE MUNICIPAL WATER AUTHORITY. JDING BUT NOT LIMITED TO THOSE ROJECT. AS THE PARTY IN THE FIELD, THE LETED TO PROVIDE A FULLY OPERATIONAL D KEEP ALL REFUSE TO A MINIMUM. CONTRACTOR SHALL BE ION SO DAMAGED. , INCLUDING PAINT, SHALL BE LAWFULLY STORED. RING NORMAL WORKING HOURS G AN EQUAL IS APPROVED BY ARCHITECT AND OWNER. NSTRUCTIONS, U.O.N. NDITIONS, NEW OR EXISTING, TO FACILITATE THE CONSTRUCTION SHALL BE COMPLETED AND VERIFIED LD CONDITIONS VARY.	DATE 9.29 DRAWN BY BL CHECKED BL	.15 K K K	PROJECT NO. 2015904.00 SHEET GOO 1 OF 1	) 1

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- 14. 15.



apaceDesign architects 2112 East War Memorial Drive endineers Peoria Illinois 61614	designers t:309.685.4784 www.apaceDesign.com	MOHR & KERR ENGINEERING & LAND SURVEYING, P.C. 5901 N. Prospect, Suite 6B Office: (309) 692-8500 Peoria, Illinois 61614 Fax: (309) 692-8501 www.mohrandkerr.com Design Firm #184.00509						
SITE LAYOUT & GRADING PLAN	New Takin Enclosure	Peoria Zoo	Peoria Park District	Peoria, IL 61603				
NO. 1 Biddir	ng Docun	JE nents	9.2	DATE 9.15				
OF 11/30/2015								
DATE 9.29 DRAWN BY MR	.15 C	09/08/2015 PROJECT NO. 2015904.00 SHEET C100						

ALL CONSTRUCTION SHALL BE IN ACCORDANCE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, STANDARD SPECIFICATION FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, LATEST EDITION. REFERENCES TO METHOD OF PAYMENT ARE NOT APPLICABLE.

ALL EXISTING UNDERGROUND UTILITIES SHOWN ON PLANS ARE APPROXIMATE. EXACT LOCATIONS AND DEPTHS SHALL BE DETERMINED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL CALL JULIE AT 811 OR 1-800-892-0123, AND CONTACT PEORIA PARK DISTRICT 48 HOURS PRIOR TO CONSTRUCTION.

IF FIELD TILE ARE ENCOUNTERED DURING CONSTRUCTION, THE TILE SHALL BE REPAIRED AND LOCATION DOCUMENTED. NOTIFY THE ENGINEER PRIOR TO PLACING ANY BACKFILL.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES WITHIN THE CONSTRUCTION LIMITS. IF ANY UTILITY IS DAMAGED DURING THE COURSE OF CONSTRUCTION, THE UTILITY OWNER SHALL BE NOTIFIED IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EXPENSES INCURED TO REPAIR THE UTILITY.

IF A UTILITY CONFLICT ARISES WHICH WILL RESULT IN DAMAGE TO A UTILITY OR WILL CAUSE THE DESIGN TO BE REVISED, CONTACT THE ENGINEER.

TRENCH BACKFILL (FA-6 OR APPROVED ON SITE MATERIAL) SHALL BE PLACED IN ALL TRENCHES UNDER PAVEMENT AND WITHIN 2' OF THE BACK OF CURB OR EDGE OF PAVEMENT. TRENCH BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF STANDARD PROCTOR.

DRAINAGE AND STORM STRUCTURES SHALL BE KEPT FREE OF DEBRIS AND DIRT DURING THE COURSE OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY ANY STORM SEWER BACKUPS.

PORTLAND CEMENT CONCRETE, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATION.

THE SUBGRADE SHALL BE PREPARED IN ACCORDANCE WITH SECTION 301 OF THE STANDARD

ELEVATIONS SHOWN ON THE PLANS ARE FINISHED GRADES UNLESS OTHERWISE NOTED.

PROVIDE 4" MIN. TOPSOIL ON ALL DISTURBED AREAS. SEEDING TO BE DONE BY OWNER.

DOWNSPOUTS SHALL BE CONNECTED TO NEW PVC PIPE WITH OUTFALL TO POOL. SEE

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATION AND SHORING NECESSARY TO MAKE UTILITY CONNECTIONS. SHORING REQUIRING ENGINEERING SHALL BE AT THE CONTRACTOR'S

ARCHITECTURAL FOR DOWNSPOUT LOCATIONS.





SANITARY SEWER SAMPLING MANHOLE DETAIL

WATER MAIN



CAST CLOSED LID GRAY IRON LID























5/8" R

5/8"



1	THIS STRUCTURE IS GOVERNED BY THE 2006 INTERNATIONAL BUILDING CODE	
	WITH OCCUPANCY CATEGORY II (TABLE 1604.5)	
<u>DESIGN L</u> 1.	UNIFORM FLOOR LIVE LOADS: SLAB-ON-GRADE	
2.	ROOF LIVE LOAD = 20 PSF, 300 LBS. CONCENTRATED.	
3.	ROOF SNOW LOAD:	
	GROUND SNOW LOAD, Pg = 20 FLAT-ROOF SNOW LOAD, Pf = 25 PSF MIN.	
	SNOW EXPOSURE FACTOR, Ce = 0.90 (FULLY EXPOSED) SNOW LOAD IMPORTANCE FACTOR. Is = 1.0	
	THERMAL FACTOR $Ct = 1.1$	
	CONDITIONS; SEE DETAILS THIS SHEET.	
4.	WIND LOAD: BASIC WIND SPEED, V = 90 MPH	
	WIND IMPORTANCE FACTOR, $I = 1.00$ WIND EXPOSURE CATEGORY = "C"	
	INTERNAL PRESSURE COEFFICIENT = $\pm 0.18$ (ENCLOSED)	
5.	EARTHQUAKE DESIGN DATA: SEISMIC USE GROUP I	
	SEISMIC IMPORTANCE FACTOR, $I_E$ , = 1.00 mapped spectral response accelerations $S_E = 0.175$ an $S_C = 0.0777$	
	SITE CLASS = "D" SPECTRAL RESPONSE COEFFICIENTS S = 0.197 AND S = 0.104	
	SEISMIC DESIGN CATEGORY = "B" PAGIO = CEICHIO = CONTENTO = CONT	
	BASIC SEISMIC-FURCE-RESISTING SYSTEM(S) = INTERMEDIATE REINFORCED MASONRY SHEAR WALLS	
	SEISMIC RESPONSE COEFFICIENT(S), $C_s = 0.053$	
	RESPONSE MODIFICATION FACTOR(S), $R = 3.5$	
	ANALISIS I NOOLDONE USED - EQUIVALENT LATENAL FONGE I NOOLDONE	
<u>GENERAL</u> 1.	COORDINATE STRUCTURAL SHEETS WITH ALL OTHER SHEETS FOR PIPE SIZES AND LOCATIONS, BEAM POCKETS,	
2.	SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING PLANS FOR ADDITIONAL SLEEVES, INSERTS,	
3.	ALL SUBTERRANEAN STRUCTURES, UTILITIES, PIPING, ETC. IN THE AREA OF ALL EXCAVATIONS TO BE LOCATED AND MARKED BY THE CONTRACTOR PRIOR TO EARTH REMOVAL WORK. PIN FLAGS OR PAINT ARE ACCEPTABLE METHODS. CONTRACTOR TO MAINTAIN MARKERS UNTIL ALL EXCAVATION ACTIVITIES HAVE CEASED. COORDINATE	
4.	ALL SECTIONS, DETAILS AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL	
5.	CONTRACTOR IS RESPONSIBLE FOR ADEQUACY OF TEMPORARY SHORING, INCLUDING WALL SHORING, TO RESIST LATERAL LOADS DURING CONSTRUCTION	
6.	CONTRACTOR IS RESPONSIBLE FOR ADEQUACY OF UNDERPINNING EXISTING FOUNDATIONS, INCLUDING WALL UNDERPINNING, TO RESIST LOADS DURING CONSTRUCTION.	
7. 8.	ALL ASTM DESIGNATIONS SHALL BE THE LATEST UNLESS NOTED OTHERWISE. DRAWING SCALES ARE FOR REFERENCE ONLY FOR PLANS AND DETAILS AND ARE SUBJECT TO VARIATIONS OF	
OONODET	DIFFERENT CONDITIONS. DO NOT SCALE DRAWINGS FOR DIMENSIONS.	
<u>CONCRET</u> 1	E ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL SLEEVES, INSERTS,	
2.	EQUIPMENT PADS, EMBEDDED ITEMS, ETC. ALL CONCRETE SLABS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ALL CONCRETE	
3. <i>.</i>	FOUNDATIONS SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI. ALL REINFORCEMENT BARS SHALL CONFORM TO ASTM: A615, GRADE 60.	
4. / ( 5.	ALL REINFORCEMENT SHALL BE FABRICATED IN ACCORDANCE WITH ACI 315, <u>DETAILS</u> AND <u>DETAILING</u> OF CONCRETE REINFORCEMENT. REINFORCEMENT SHALL BE CLEAN AND FREE OF GREASE, SCALING AND RUST. PROTECTIVE COVERING FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED ON THE	
[	DRAWINGS: A. 3" WHERE CONCRETE IS CAST AGAINST GROUND	
	B. 1" FOR SLABS C. 12" FOR WALLS PIERS AND COLUMNS	
6. I 7	PROVIDE CORNER BARS IN ALL FOUNDATION WALLS EQUAL IN SIZE AND NUMBER TO HORIZONTAL REINFORCING.	
8.	COLUMNS. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185, FLAT SHEETS ONLY.	
9. (	CONTINUOUS TOP AND BOTTOM BARS, WHEN SHOWN IN SECTION ONLY, SHALL BE LAPPED AS FOLLOWS: TOP BARS NEAR MIDSPANS, BOTTOM BARS DIRECTLY OVER SUPPORTS.	
10.	ALL CONCRETE WORK SHALL CONFORM TO: ACI 318, BUILDING CODE FOR STRUCTURAL CONCRETE AND ACI 301, SPECIFICATION FOR STRUCTURAL CONCRETE.	
11.	PROVIDE CONTROL OR CONSTRUCTION JOINTS IN SLAB-ON-GRADE AT 15'-0" MAXIMUM SPACES EACH DIRECTION. CONTROL JOINTS TO BE SAW CUT OR TOOLED ONE-QUARTER DEPTH OF THE SLAB.	
12. I EPOXY	REFER TO SPECIFICATION SECTION 033000, "CAST-IN-PLACE CONCRETE" FOR ADDITIONAL REQUIREMENTS.	
<u> </u>	THE EPOXY SHALL BE A TWO COMPONENT, EPOXY RESIN BONDING SYSTEM CONFORMING TO THE	
	REQUIREMENTS OF ASTM DESIGNATION: C 881, TYPE IV, GRADE 2, CLASS C. SUBMIT INFORMATION ON EPOXY MATERIAL TO ENGINEER FOR APPROVAL.	
2.	DRILL HOLES IN EXISTING CONCRETE, THEN REPEATEDLY WIRE BRUSH HOLES CLEAN AND REMOVE DUST WITH COMPRESSED AIR, UNTIL THE HOLE IS COMPLETELY CLEAN. ANCHOR DOWEL BARS WITH ADHESIVE. FOLLOW ALL ADDITIONAL MANUFACTURER'S INSTRUCTIONS.	

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## <u>PENTRY:</u>

- ALL SHEATHING SHALL BE INSTALLED WITH THE LONG DIMENSION PERPENDICULAR TO SUPPORTING MEMBERS (EXCEPT WALL PANELS) AND SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) SPANS. STAGGER THE LOCATIONS OF ADJACENT PANEL END JOINTS 4'-O" MINIMUM. ALL PANEL END JOINTS SHALL OCCUR OVER FRAMING MEMBERS. ALLOW 1/6" SPACING AT ALL PANEL EDGES U.N.O BY THE PANEL MANUFACTURER. PROVIDE ONE (1) PANEL EDGE CLIP BETWEEN SUPPORTS WHERE T&G PANELS ARE NOT SPECIFIED. PROVIDE ADDITIONAL CLIPS AS REQUIRED WHERE SUPPORTS ARE SPACED GREATER THAN THE MAXIMUM EDGE SUPPORT SPACING PER APA SPAN RATING TABLES AND PROVIDE A MINIMUM OF (2) CLIPS WHERE SUPPORTS ARE SPACED GREATER THAN 24" O/C.
- REFER TO SPECIFICATION SECTION 061600 "SHEATHING" FOR ADDITIONAL REQUIREMENTS.
- SHEATHING SHALL BE PRESERVATIVE TREATED.

### NDATION

- ALL FOOTING EXCAVATIONS SHALL BE CLEAN AND FREE OF DEBRIS, STANDING WATER AND LOOSE SOIL PRIOR TO PLACING CONCRETE. FOOTINGS SHALL BE INSPECTED AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO CONCRETE PLACEMENT.
- FOOTINGS SHALL BE CENTERED ON COLUMN LINES, AND WALLS, UNLESS NOTED OTHERWISE (U.N.O.) BANK FORM FOOTINGS WHERE SOIL CONDITIONS WILL PERMIT OR INDICATED.
- IN STRUCTURAL AREAS (WHERE STRUCTURES DERIVE SOME OR ALL SUPPORT FROM FILL-SUPPORTED FOUNDATIONS) AND SLAB-ON-GRADE, FILL SHALL BE COMPACTED TO 98 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698)
- ALL FILL MATERIAL SHALL BE APPROVED FOR USE IN ADVANCE OF PLACEMENT BY THE OWNER'S REPRESENTATIVE. NO FILL SHALL BE PLACED OVER FROZEN, MUDDY OR OTHER DELETERIOUS MATERIAL. LIFT THICKNESS SHALL BE MINIMIZED TO ALLOW EFFICIENT COMPACTION. NO FILL MAY BE PLACED OVER A PREVIOUS LIFT THAT HAS NOT BEEN ADEQUATELY COMPACTED AND HAS BEEN ACCEPTED BY THE OWNER'S REPRESENTATIVE.
- BACKFILL AGAINST GRADE WALLS SHALL BE PLACED EVENLY ON ALL SIDES.
- BEAR ALL SPREAD FOOTING ON UNDISTURBED SOILS HAVING A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 2,000 POUNDS PER SQUARE FOOT.
- ALLOW THE GEOTECHNICAL ENGINEER TO INSPECT ALL FINISHED EXCAVATIONS AND BEARING SUBGRADES BEFORE PLACING CONCRETE.
- THE FOUNDATIONS HAVE BEEN DESIGNED TO THE REQUIREMENTS SET FORTH IN THE GEOTECHNICAL REPORT PREPARED BY WHITNEY & ASSOCIATES, DATED JULY 14, 2015.
- 10. REFER TO SPECIFICATION SECTION 312000, "EARTHWORK" FOR ADDITIONAL REQUIREMENTS.

### \_\_PLATE\_CONNECTED\_WOOD\_TRUSSES:

- ALL WOOD TRUSSES SHALL BE DESIGNED, DETAILED, FABRICATED, HANDLED, BRACED AND INSTALLED IN STRICT ACCORDANCE WITH THE 'DESIGN SPECIFICATION FOR METAL-PLATE-CONNECTED WOOD TRUSSES' OF THE TRUSS PLATE INSTITUTE (TPI) TO SAFELY SUPPORT THE DESIGN LOADS AND SPAN CONDITIONS INDICATED IN THE CONTRACT DOCUMENTS. THE RECOMMENDED MINIMUM DESIGN LOADS OF APPENDIX "A" OF TPI SHALL MEET ALL
- REQUIREMENTS OF THE GOVERNING CODES AND BUILDING DEPARTMENTS. ALL WOOD TRUSSES AND CONNECTIONS SHALL BE DESIGNED BY AN ILLINOIS LICENSED STRUCTURAL ENGINEER (SE) RETAINED BY THE TRUSS MANUFACTURER. THE TRUSS MANUFACTURER SHALL SUBMIT SIGNED AND SEALED TRUSS DESIGN AND CONNECTION CALCULATIONS.
- 3. ALL TRUSSES SHALL BE FACTORY MANUFACTURED UTILIZING WOOD WEBS AND WOOD CHORDS. 4. ROOF TRUSS DESIGN LOADS ARE AS FOLLOWS AND AS INDICATED ON THE PLANS.
  - a. TOP CHORD DEAD LOAD: 10 POUNDS PER SQUARE FOOT
  - b. BOTTOM CHORD DEAD LOAD: 10 POUNDS PER SQUARE FOOT.
  - c. TOP CHORD LIVE LOAD: 20 POUNDS PER SQUARE FOOT.
  - d. BALANCED SNOW LOAD: 25 POUNDS PER SQUARE FOOT.
  - e. UNBALANCED SNOW LOAD: SEE THIS SHEET.
  - f. SNOW LOAD AT PROJECTIONS: SEE THIS SHEET.
  - q. WIND LOAD ACTING TOWARDS ROOF SURFACE: PER ASCE 7-05.
  - h. WIND LOAD ACTING AWAY FROM ROOF SURFACE: PER ASCE 7-05. i. WIND LOAD AT OVERHANGS ACTING AWAY FROM ROOF SURFACE:
  - PER ASCE 7-05.
  - j. LOAD COMBINATIONS: IN ACCORDANCE WITH "2006 INTERNATIONAL BUILDING
  - CODE." k. 300 LBS. CONCENTRATED LIVE LOAD FOR MAINTENANCE, ACTING ANYWHERE ALONG THE SPAN.
- MAXIMUM TRUSS DEFLECTION UNDER DESIGN LOADS:
- a. TRUSSES: VERTICAL DEFLECTION OF 1/240 OF SPAN DUE TO TOTAL
- LOAD. b. TRUSSES: VERTICAL DEFLECTION OF 1/360 OF SPAN DUE TO SNOW
- OR LIVE LOAD. 6. PERMANENT BOTTOM CHORD BRACING SHALL CONSIST OF CONTINUOUS 2x4'S (MINIMUM LENGTH 8'-0") NAILED TO THE TOP OF THE TRUSS BOTTOM CHORDS AT OR NEAR PANEL POINTS. DIAGONAL BRACING SHALL BE PLACED AT APPROXIMATELY A 45 DEGREE ANGLE. THE DIAGONAL BRACING SHALL BE PLACED BOTH IN THE PLANE OF THE BOTTOM CHORD AND IN THE PLANE OF
- THE WEB MEMBERS. PROVIDE AUXILIARY WOOD FRAMING AS REQUIRED FOR ALL OPENINGS, VALLEYS, RIDGES, ETC.
- REFER TO SPECIFICATION SECTION 061753 "SHOP-FABRICATED WOOD TRUSSES" FOR ADDITIONAL REQUIREMENTS
- TRUSSES CONSTRUCTED FROM WOOD-PRESERVATIVE TREATED LUMBER. 10. ALL STEEL CONNECTIONS AND TRUSS PLATES SHALL BE GALVANIZED AND COMPATIBLE WITH
- TREATED LUMBER AND PROTECTED FROM CORROSION.

### MASONRY

- DAYS.
- INCLUDING:
- WITH THE CONTRACT DOCUMENTS.

- 9. MASONRY CONSTRUCTION SHALL CONFORM TO THE REGULATIONS OF ACI 530.1/ASCE 6/TMS 602. 10. REFER TO SPECIFICATION 04200 "UNIT MASONRY FOR ADDITIONAL REQUIREMENTS.

1. PROVIDE UNIT MASONRY THAT DEVELOPS 2,000 PSI NET-AREA COMPRESSIVE STRENGTH (f'm) AT 28 2. MASONRY DESIGN BASED ON INSPECTED WORKMANSHIP. SAMPLE, TEST AND INSPECT MASONRY IN ACCORDANCE WITH TABLE 5, "LEVEL 'B' QUALITY ASSURANCE", OF ACI 530.1/ASCE 6/TMS 602, à p p A. CERTIFICATES FOR MATERIALS USED IN MASONRY CONSTRUCTION INDICATING COMPLIANCE B. VERIFICATION OF I'M PRIOR TO CONSTRUCTION. sign a) AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE: PROPORTIONS OF SITE MIXED MORTAR - CONSTRUCTION OF MORTAR JOINTS Ă - LOCATION OF REINFORCEMENT AND CONNECTORS b) PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE: 6 - GROUT SPACE IS CLEAN ap - GRADE AND SIZE OF REINFORCEMENT, CONNECTORS - PLACEMENT OF REINFORCEMENT AND CONNECTORS - PROPORTIONS OF SITE PREPARED GROUT - CONSTRUCTION OF MORTAR JOINTS c) VERIFY PLACEMENT OF GROUT d) OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS e) VERIFY COMPLIANCE WITH THE REQUIRED INSPECTION PROVISIONS OF THE CONTRACT DOCUMENTS AND THE APPROVED SUBMITTALS 3. MORTAR TO BE TYPE "S" COMPLYING WITH THE REQUIREMENTS OF ASTM C 270. 4. ALL GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2,500 P.S.I. AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM C 476. 5. CMU UNITS SHALL CONFORM TO ASTM C 55 OR C 90 WITH A MINIMUM AVERAGE NET AREA COMPRESSIVE STRENGTH OF 2,800 PSI MINIMUM. 6. REINFORCEMENT TO BE AS CALLED FOR ON THE DRAWINGS AND SCHEDULES, ALL REINFORCEMENT BARS SHALL CONFORM TO ASTM-A615 GRADE 60. 7. MASONRY UNITS TO BE PLACED IN RUNNING BOND, UNLESS OTHERWISE NOTED. 8. ALL BEAM BEARINGS SHALL BE GROUTED TO THE FOUNDATION.









- 1. BEAR ALL FOOTINGS ON UNDISTURBED SOILS HAVING A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 2,000 PSF.
- FOOTINGS WERE SIZED TO MEET A NET ALLOWABLE SOIL BEARING PRESSURE OF 2,000 PSF.
- FOOTINGS SHALL BE CENTERED ON WALLS UNLESS OTHERWISE NOTED.
   3'-0" DEEP COMPACTED CRUSHED GRAVEL (CA-7) AT EXTERIOR DOORWAYS BELOW ENTRY SLABS. EXTEND OUT FROM BUILDING A MINIMUM OF 5'-0" x
- WIDTH OF OPENING OR SIDEWALK, WHICHEVER IS GREATER, SEE DET. 2/S301.
  5. REFER TO SHEETS S301 AND S302 FOR FOUNDATION DETAILS AND SECTIONS. REFEER TO SHEET S001 FOR STRUCTURAL GENERAL NOTES.



TND

2 OF 7

## LEGEND

- TOF = TOP OF FOOTING ELEVATION (EL. 97'-0" U.N.O.)
- TOW = TOP OF WALL ELEVATION (EL. 100'-0" U.N.O.)
- $\langle \rangle$  = FOOTING MARK, SEE SCHEDULE
- = SHEET NOTE MARK, SEE CORRESPONDING SHEET NOTE.

## FOOTING SCHEDULE

## WALL FOOTINGS

RK	w	SIZE x L x T					EQU	REINF ALLY S	PACED					
5〉	1'-6" x	CONT. x	1'-0"	2-#5	BARS	x CONT	., #4	TRANS	VERSE	0	48"	CTS.(	BOTTO	V)
0〉	2'-0" x	CONT. x	1'-0"	3-#5	BARS	x CONT	., #4	TRANS	VERSE	0	48"	CTS.(	BOTTO	V)
/ = /	WIDTH	L =	LENGTH		Т	= THI	CKNE	SS						



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## MASONRY WALL REINFORCING SCHEDULE

MARK	REINFORCING	REM
1	#4 VERT. BARS @ 48" CTS., & HORIZONTAL JOINT REINFORCING @ 16" CTS.	SEE DET.
2	#4 VERT. BARS @ 8" CTS., & HORIZONTAL JOINT REINFORCING @ 8" CTS.	SEE DET.

EMARKS T. 4A/S401 . 4B/S401

		-				
<u>R</u>	OOF FRAMING SHEET NOTES		ve 85.4784	91-0902 -1327	nc.com wide	
1.	AT WALLS: PROVIDE SIMPSON H1 TRUSS ANCHORS AT EACH TRUSS BEARING IN		orial Dri <sup>,</sup> 4 : 309.68	(309) 6	nson-ir Nationv	
	ACCORDANCE WITH DETAIL 1/S401, PROVIDE SIMPSON LGT2 OR LGT3-SDS2.5 TRUSS ANCHORS AT GIRDER TRUSS BEARINGS.	cts ers	ar Mem s 6161 <sup>4</sup> F722 F	hone:	ww.ha	
2.	TRUSS SUPPLIER TO PROVIDE SUPPLEMENTAL ROOF FRAMING, BRACING, AND BRIDGING AS REQUIRED	hite. ginee signe	East W a Illinois 19.685.4		. S O	200
3.	SEE SHEET SOOT FOR STRUCTURAL GENERAL NOTES.	arc eno des	2112 Peoric T: 30		Inc. 20	uite 2
4. 5.	ROOF SHEATHING SHALL BE LOCATED THROUGHOUT AND NOT INTERRUPTED. TRUSS WEB BRACING: THE TRUSS DESIGN DRAWINGS INDICATE LOCATIONS OF				ervices	, SL
	WHERE CONTINUOUS LATERAL BRACING (CLB) IS TO BE ATTACHED TO THE				onal Se	y St 1614
	LENGTHS) COMBINED WITH DIAGONAL BRACING IN THE PLANE OF THE TRUSS WEB	SS.			rofessi	ersit s 6`
	MEMBER. THE CLB'S MUST BE ANCHORED AT EACH END. INSTALL THE DIAGONAL BRACING AT APPROXIMATELY 45 DEGREES TO THE CLB AND EXTEND					Univ linoi
	FROM THE TOP CHORD TO THE BOTTOM CHORD, REPEAT EVERY 12 FEET OR	ac			ight Ho	a, II. −
	WITH NO LESS THAT 2–16D NAILS, AND ANCHOR ENDS WITH 4–16D NAILS.	<b>j</b>			) Copyr	7625 Peor
	REFER TO BCSI—B3 SUMMARY SHEET BY WTCA AND TPI FOR DETAILED REQUIREMENTS.					
6.	PERMANENT SWAY BRACING (REFERENCE BCSI-B3 SUMMARY SHEET BY WTCA AND					
	THE DIAGONAL BRACING AT APPROXIMATELY 45 DEGREES TO THE HORIZON, IN					
	THE VERTICAL PLANE, AND EXTEND FROM THE TOP CHORD TO THE BOTTOM CHORD, REPEATED AT 12 FT. MAXIMUM SPACING. LOCATE AS CLOSE TO THE					
	TRUSS CHORDS AS POSSIBLE. ATTACH DIAGONAL BRACING TO EACH WEB THAT IS					
7	NAILS.					
/.	WTCA AND TPI): LOCATE AT MAXIMUM SPACING DETERMINED BY DELEGATED					
	DESIGN. BOTTOM CHORD PERMANENT LATERAL RESTRAINT BRACING SHALL BE					
-	2-16D NAILS.					
8.	THERE IS NOT A RIGID CEILING ATTACHED TO THE BOTTOM CHORD OF THE TRUSSES. DELEGATED DESIGN SHALL INCORPORATE THIS INTO BRACING					
9.	REQUIREMENTS. CONFIRM QUANTITY, LOCATION AND WEIGHT OF ROOFTOP FOUIPMENT WITH					
5.	CONTRACTOR PRIOR TO FABRICATION OF TRUSSES.					
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		NO.	IS	SUE		DATE
SH	<u>EET NOTES</u>	1 Biddin	g Docum	ents	9.	29.15
1. 2	PROVIDE TRUSS ANCHORS AT EACH TRUSS BEARING IN ACCORDANCE WITH DETAILS.					
∠. 3.	SEE SHEET SOOT FOR SNOW LOADS AND STRUCTURAL GENERAL NOTES.					
т.	USING RUNNING BOND. CONTROL JOINTS (C.J.) SHALL BE LOCATED WHERE					
5.	INDICATED AT TEE INTERSECTIONS. SEE S401 FOR LINTEL/HEADER SCHEDULE.					
				1		
		<sup>DATE</sup> 9.29.	15		т NO. 015904	4.0
		drawn by TW	Z	SHE	ET	
			D		20	<u>01</u>
		APPROVED	-		52	
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WA	LLS				CEIL	ING	
Т	SOL	JTH	WE	ST	MATERIAL/		REMARKS
FINISH	MATERIAL	FINISH	MATERIAL	FINISH	FINISH	HEIGHT	
SEALER	CMU	SEALER	CMU	SEALER	EXPOSED	VARIES	-
N/SEALER	GALV. STL.	Ν	CMU	SEALER	EXPOSED	VARIES	-
N/SEALER	GALV. STL.	Ν	GALV. STL./CMU	N/SEALER	EXPOSED	VARIES	-
SEALER	GALV. STL.	Ν	GALV. STL./CMU	N/SEALER	EXPOSED	VARIES	-
SEALER	GALV. STL./CMU	N/SEALER	CMU	SEALER	EXPOSED	VARIES	-

REMARKS
#234 SERIES AND NECESSARY ACCESSORIES.
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## SECTION THRU DOOR LOCK

3-3/4"













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TYP.



16





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2 A300

16

1 (A300

10" DIA. TUBE SKYLIGHT, CENTER TUBE AND FLASHING BETWEEN STANDING SEAMS OF MET. ROOFING SYSTEM, TYP. STANDING SEAM MET. ROOFING — SYSTEM, TYP. SYNTHETIC UNDERLAYMENT, CONT., TYP. 3/4" SHEATHING, CONT., TYP. ICE AND WATER SHIELD, -CONT., TYP. 5" POLYISO. INSUL., CONT., — TYP. 5/8" SHEATHING, CONT., SEE — STRUCT., TYP.

> TUBE SKYLIGHT DETAIL 2 (ALT. BID NO. 1) A101 SCALE: 1-1/2" = 1'-0" \_\_\_\_\_

REVISED KEYED NOTES: (APPLY TO THIS SHEET ONLY)         01       = STANDING SEAM MET. ROOF SYSTEM, CONT., TYP.         02       = 6" PRE-FINISHED GUTTER, CONT., TYP.         03       = 4x6 PRE-FINISHED DOWNSPOUT, CONT., TYP.         04       = OUTLINE OF BUILDING BELOW, SHOWN DASHED.         05       = TUBE SKYLIGHT W/ PITCHED FLASHING BOOT FROM MANUF., SEE DET. 2/A101. (ALTERNATE BID NO. 1)         06       = PRE-FINISHED MET. RIDGE/HIP CAP, CONT., TYP.         07       = VENT THRU ROOF FROM TRENCH DRAIN, SEE PLUMB. PROVIDE/INSTALL FLASHING BOOT.         08       = VENT THRU ROOF FROM UNIT HEATER, SEE MECH. PROVIDE/INSTALL FLASHING BOOT.	CeDesign apaceDesign acchitects 2112 East War Memorial Drive endineers Peoria Illinois 61614	designers t:309.685.4721 f:309.685.4784 www.apaceDesign.com	Sidding Documents are the exclusive property of apaceDesign ittects + Engineers; and can only be used with the express ssion of apaceDesign Architects + Engineers. Furthermore, ese documents cannot be copied (either mechanically or ctronically), in whole or in part, without the express written permission of apaceDesign Architects + Engineers.
- SELF FLASHING BOOT, TYP.	Roof Plan	Jew Takin Enclosure	Peoria Zoo Peoria Park District Peoria, IL 61603
- SPRAY FOAM INSUL., CONT.,			
— TRTD. WD. 2x6 FRAMED OPNG, TYP.	NO. 1 Biddin	iss ig Docun	ue DATE nents 9.29.15
— WD. TRUSS, SEE STRUCT., TYP.			
<ul> <li>EXTENSION TUBE WITH ANGLE ADAPTERS, TAPE ALL JOINTS WITH 2" FOIL TAPE, TYP.</li> </ul>			
	DATE 9.29. DRAWN BY BLI CHECKED BLI APPROVED BLI	.15 K K K	PROJECT NO. 2015904.00 SHEET <b>A101</b>








<ul> <li>PLUSED KEYED NOTES: (APPLY TO THIS SHEET ONLY)</li> <li>P = GALV. STL. BRACING, SEE STRUCT.</li> <li>P = CAGED CEILING FAN, SEE ELEC.</li> <li>P = RADIANT HEATER, SEE MECH.</li> <li>P = RADIANT HEATER, SEE STRUCT., TYP.</li> <li>P = LIGHT, SEE ELEC., TYP.</li> <li>P = TUBE SKYLIGHT (ALTERNATE BID NO. 1)</li> </ul>	apaceDesign apace	designers t:309.685.4784 www.apaceDesign.com	These Bidding Documents are the exclusive property of apaceDesign Architects + Engineers; and can only be used with the express permission of apaceDesign Architects + Engineers. Furthermore, these documents cannot be copied (either mechanically or electronically), in whole or in part, without the express written permission of apaceDesign Architects + Engineers.
	Reflected Ceiling Plan	New Takin Enclosure	Peoria Zoo Peoria Park District Peoria, IL 61603
		15 K	UE DATE nents 9.29.15







UNI	T HEATER SCHEDULE	
UNIT	NUMBER	UH-1
LOCA	TION	EAST END
FAN T	YPE	CENTRIFUGAL
REQU	IRED HEATING CAPACITY (BTU/HR.)	99,000
HEAT	ING SOURCE	NATURAL GAS
MAXI	MUM GAS INPUT	125,000
REQU	IRED GAS PRESSURE RANGE (INCHES WATER)	6" - 7"
NOMIN	AL AIRFLOW (CFM)/STATIC PRESSURE IN WATER	1,800/0.5
MAXI	MUM SOUND LEVEL (dBA @15 FT.)	40
COME	BUSTION TYPE	SEPARATED
BURNER/HEAT EXCHANGER		2-STAGE 409 ST. STL.
VENT SIZE		4"
MAXI	MUM WEIGHT (POUNDS)	140
MININ	IUM EFFICIENCY	80%
ACCE	SSORIES	2-STAGE THERMOSTAT CONCENTRIC INTAKE/VENT
	VOLTAGE/PHASE	115 / 1φ
۲.	MAXIUM HORSEPOWER	1/2
OTO DATA	ТҮРЕ	3-SPEED OPEN DRIP-PROOF
ΣĽ	MAXIMUM FULL-LOAD AMPS	13
	MAXIMUM OVER-CURRENT PROTECTION (AMPS)	30
UF.	MODINE	HDC 125
MAN	REZNOR	UDBS 125

FAN	N SCHEDULE			
UNIT	NUMBER	EF-1	EF-2	
LOCA	TION	EAST END	WEST END	
AREA	SERVED	TAKIN STALLS	TAKIN STALLS	
AIRFI	LOW REQUIRED (CFM) (HIGH/LOW)	500/220	500/220	
STAT	IC PRESSURE (IN WATER)	.25/10	.25/10	
TYPE		CEILING CENTRIFUGAL	CEILING CENTRIFUGAL	
ΜΑΧΙ	MUM FAN OUTLET SIZE	10" x 8"	10" x 8"	
NOMINAL RPM (HIGH/LOW)		906/690	906/690	
DRIVE		DIRECT	DIRECT	
GRILI	LE TYPE	ALUMINUM	ALUMINUM	
MAXIMUM POWER REQUIRED (WATTS)		285	285	
VOLT	AGE/PHASE	115 / 1φ	115 / 1φ	
ACCESSORIES DS ELECTRIC DISCONNECT SWITCH G GRAVITY DAMPER SC SPEED CONTROL		DS G REMOTE SC	DS G REMOTE SC	
ANUF.	GREENHECK	SP-A710-VG	SP-A710-VG	
ž				



END KEY: DUCT TO BE INSTALLED RECTANGULAR DUCT; X"-WIDE x Y"-DEEP HARD ROUND DUCT; A"-DIAMETER RECTANGULAR-TO- ROUND TRANSFER THERMOSTAT	apace Design designers	2112 East War Memorial Drive Peoria Illinois 61614 T: 309.685.4722 F: 309.685.4784		
	/AC PLAN	w Takin Enclosure	oria 200 oria Dark Dietrict	oria, IL 61603
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= 1-0"	DATE 09.2 DRAWN BY BA CHECKED	9.15 .W	SHEET	904.00
plot @1/4" =	APPROVED MA	AC AC		DF 2

END KEY:
DUCT TO BE INS
RECTANGULAR X"-WIDE x Y"-DE
HARD ROUND D A"-DIAMETER
RECTANGULAR ROUND TRANSF
THERMOSTAT





## KEYED ELECTRICAL NOTES

(1) EXISTING BUILDING TO BE DEMOLISHED.

2 EXISTING ABANDONED OVERHEAD ELECTRICAL UTILITY CONDUCTORS TO REMAIN.

3 FEED TO EXISTING BUILDING TO BE DISCONNECTED AT PANEL MOUNTED ON POLE, AND REMOVED TO THE EXTENT POSSIBLE, PRIOR TO BUILDING DEMOLITION. ABANDON WHERE REMOVAL IS NOT FEASIBLE. REMOVE EXISTING LOAD CENTER AND RECEPTACLES FOR REPLACEMENT WITH PANEL INSIDE NEW BUILDING AND NEW RECEPTACLES AT POLE. EXISTING UNDERGROUND SERVICE, RISER, METER, AND FUSED DISCONNECT SWITCH SHALL REMAIN.

4 EXISTING FEED TO BUILDING BEING REMOVED.

5 PROVIDE 3#3 AND 1#8 GND IN 1–1/4" PVC TO NEW BUILDING. SEE POWER PLAN 2/E100 AND RISER DIAGRAM ON SHEET E200 FOR ADDITIONAL INFORMATION.







## KEYED ELECTRICAL NOTES

EXTEND PVC CONDUIT UP INTO BOTTOM OF WATERER FOR POWER CONNECTION TO HEATING ELEMENT. REFERENCE DETAIL 2/P100.

2 SURFACE MOUNT NEW PANEL AND FEED FROM EXISTING POLE MOUNTED DISCONNECT. SEE SITE PLAN ON SHEET E001 AND RISER DIAGRAM ON SHEET E200 FOR ADDITIONAL INFORMATION.

3 POSITION CEILING FANS BETWEEN STRUCTURAL MEMBERS TO MAINTAIN HEIGHT OF 11' TO BOTTOM OF FAN.

(4) INSTALL FAN DISCONNECT TOGGLE SWITCH AT 48" AFF. PROVIDE 120V CONNECTION TO ASSOCIATED CONTROL VOLTAGE TRANSFORMER (FURNISHED WITH EXHAUST FAN). MOUNT LOW-VOLTAGE SPEED CONTROL DEVICE (FURNISHED WITH EXHAUST FAN), ADJACENT TO TOGGLE SWITCH. ROUTE LOW-VOLTAGE WIRING FROM TRANSFORMER TO SPEED CONTROL AND FAN IN SEPARATE 1/2" CONDUIT. PROVIDE 3#14 BETWEEN TRANSFORMER AND SPEED CONTROL DIAL. COORDINATE WITH FAN MANUFACTURER.

5 DISCONNECT AND REMOVE EXISTING LOAD CENTER AND RECEPTACLES, MOUNTED ON POLE. PROVIDE NEW CONNECTION FROM EXISTING POLE MOUNTED DISCONNECT SWITCH TO NEW PANEL A. SEE DIAGRAM AND ADDITIONAL INFORMATION ON SHEET E200. PROVIDE NEW WEATHERPROOF RECEPTACLES ON POLE, FED FROM PANEL A.

abace Services       Services         abace Services       Services         apacebesion       Services <th>PEORIA, IL 61603 FAX 309-214-0063</th>	PEORIA, IL 61603 FAX 309-214-0063
Revised Electrical Plans New Takin Enclosure Peoria Zoo Peoria Park District	
NO.     ISSUE     DATE       1     Bidding Documents     10.21.       -     -     -       -     -     -	15
BRIAN R BRIAN R 062-050306 EXPIRES: 30NOVIS OF ILLING DATE: 9/29/2015	
DATE PROJECT NO. 9.29.15 2015904.00 DRAWN BY SHEET ATF	

NOTE:

CONDUITS FOR DEVICES AT EXTERIOR BUILDING WALLS SHALL BE ROUTED CONCEALED IN WALL TO RECESSED FLUSH OUTLET BOX. CONDUITS FOR DEVICES WITHIN THE BUILDING SHALL BE ROUTED EXPOSED FOR FUTURE ACCESS, TO SURFACE MOUNTED OUTLET BOXES.



		EC	QUIPMENT (	CONNEC	CTION S	CHEDU	LE	
CALLOUT	SYMBOL	NEMA	VOLTS	AMPS	KVA	HP	CIRCUIT	WIRE CALLOUT
EF—1	<b>\$</b>		120V 1P 2W	2.4	0.29		A-5	3/4"C,1#12,#12N,#12G
EF-2	<b>\$</b>		120V 1P 2W	2.4	0.29		A-5	3/4"C,1#12,#12N,#12G
UH-1	<b>©_\$</b>		120V 1P 2W	9.8	1.18	1/2 HP	A-7	3/4"C,1#12,#12N,#12G
WATERER	Ø		120V 1P 2W	2.5	0.3		A-3	3/4"C,1#12,#12N,#12G
WATERER	Ø		120V 1P 2W	2.5	0.3		A-1	3/4"C,1#12,#12N,#12G
WATERER	Ø		120V 1P 2W	2.5	0.3		A-1	3/4"C,1#12,#12N,#12G
WATERER (FUTURE)	Ø		120V 1P 2W	2.5	0.3		A-3	3/4"C,1#12,#12N,#12G

KEY	'ED EL
	NEW PAN
2	CONNECT
3	PROVIDE
4	PROVIDE ELECTROI
5	PROVIDE
6	PROVIDE BRONZE CONDUCT
7	PROVIDE GRADE, I
8	EXISTING
9	EXISTING
10	REMOVE CONTRAC FROM EX
11	EXISTING REPLACE PROVIDE
12	EXISTING REMOVAL

TO ELECTRICAL DEVICE TO BE GROUNDED



## LECTRICAL NOTES

ANEL 'A' IN NON-METALLIC ENCLOSURE. SEE PLAN 2/E100 FOR LOCATION IN BUILDING.

T FEEDER GROUNDED CONDUCTOR (NEUTRAL) TO NEUTRAL BUS.

GROUNDING BUSHING WITH #8 AWG BONDING JUMPER TO PANEL GROUND BUS. #8 AWG GROUNDING ELECTRODE CONDUCTOR FROM PANEL GROUND BUS TO GROUNDING DDE.

3/4" PVC TO BELOW GROUND FOR ROUTE OF GROUNDING ELECTRODE CONDUCTOR.

E NEW 10' x 3/4" COPPER-CLAD STEEL GROUNDING ELECTRODES (GROUND RODS) WITH E CLAMPS A MINIMUM OF 12' APART, JUST OUTSIDE BUILDING. EXTEND GROUNDING ELECTRODE CTOR BETWEEN GROUND RODS.

E 3#3 IN 1–1/4" PVC MINIMUM 18" BELOW GRADE. INSTALL WARNING RIBBON 6" BELOW IN TRENCH ABOVE CONDUIT.

G POLE MOUNTED DISCONNECT SWITCH; EXTEND CONDUIT AND CONDUCTORS TO SWITCH.

E EXISTING POLE MOUNTED LOAD CENTER AND ASSOCIATED WEATHERPROOF RECEPTACLES. ACTOR SHALL VERIFY TERMINATION POINT OF CONDUIT/CONDUCTORS ROUTED UNDERGROUND XISTING LOAD CENTER, PRIOR TO REMOVAL.

GROUNDING ELECTRODE (GROUND ROD). REMOVE EXISTING GROUNDING CONDUCTOR AND E WITH NEW #6 BARE COPPER GROUNDING CONDUCTOR TO EXISTING DISCONNECT SWITCH. E NEW GROUND LUG IN DISCONNECT SWITCH HOUSING FOR CONNECTION.

GOVERHEAD AMEREN UTILITY CONDUCTORS THAT HAVE BEEN ABANDONED. COORDINATE L WITH UTILITY COMPANY.







		MATERIAL SCHEDULE	
ITEM	SYMBOL	DESCRIPTION	MANUFACTURER
1	\$	SINGLE POLE SWITCH, TOGGLE HANDLE, MAINTAINED CONTACT, 20 AMP, 120/277 VOLT. SIDE AND BACK WIRED.	HUBBELL 1221 LEVITON PASS & SEYMOUR COOPER
2	\$ <sub>D</sub>	FAN SPEED CONTROL/DIMMER SWITCH COMPATIBLE WITH 120-VOLT FAN MOTORS. COORDINATE COMPATIBILITY WITH MANUFACTURER SUBMITTED. PROVIDE GASKETED WEATHERPROOF COVER OVER SPEED CONTROL SWITCH.	LUTRON PASS & SEYMOUR COOPER LEVITON
3	\$3	SWITCH, THREE WAY, TOGGLE HANDLE, MAINTAINED CONTACT, 20 AMP, 120/277 VOLT. SIDE AND BACK WIRED.	HUBBELL 1223 LEVITON PASS & SEYMOUR COOPER
4	\$ <sub>wP</sub>	SWITCH INSTALLED IN WEATHERPROOF OUTLET BOX WITH NEMA 3R NON-METALLIC COVER WITH LEVER TYPE EXTERNAL SWITCH OPERATOR (FOR TOGGLE TYPE SWITCHES)	HUBBELL HBL13R23 OR APPROVED EQUIVALENT
5	€G	GROUND FAULT DUPLEX RECEPTACLE, STRAIGHT BLADE, 20 AMPERE, SPECIFICATION GRADE, 3 WIRE GROUNDING TYPE, IMPACT RESISTANT THERMOPLASTIC FACE, TEST AND RESET BUTTONS IN FACE. FEDERAL SPECIFICATION AND U.L. LISTED, 2003 U.L. 943 COMPLIANT. ("A" WOULD INDICATE ABOVE COUNTER INSTALLATION.)	HUBBELL GFR-5352ST, LEVITON, PASS & SEYMOUR, COOPER
6	₽₽ <sub>G</sub>	DOUBLE DUPLEX GROUND FAULT RECEPTACLE, TWO EACH GROUND FAULT INTERRUPTING RECEPTACLES IN ONE COMMON BACK BOX, STRAIGHT BLADE, 20 AMPERE, SPECIFICATION GRADE, 3 WIRE GROUNDING TYPE, IMPACT RESISTANT THERMOPLASTIC FACE, TEST AND RESET BUTTONS IN FACE. FEDERAL SPECIFICATION AND U.L. LISTED, 2003 U.L. 943 COMPLIANT. ("A" WOULD INDICATE ABOVE COUNTER INSTALLATION.)	2 EACH HUBBELL GFR-5352ST LEVITON, PASS & SEYMOUR, COOPER
7	₽ ₩/G	GROUND FAULT DUPLEX RECEPTACLE, STRAIGHT BLADE, 20 AMPERE, SPECIFICATION GRADE, 3 WIRE GROUNDING TYPE, IMPACT RESISTANT THERMOPLASTIC FACE, TEST AND RESET BUTTONS IN FACE. WEATHERPROOF COPPERPLATE, NEMA 4 RATED WHILE IN USE. FEDERAL SPECIFICATION AND U.L. LISTED, 2003 U.L. 943 COMPLIANT.	HUBBELL GFR-5352ST/WP826MP LEVITON, PASS & SEYMOUR, COOPER
8	$\heartsuit$	EQUIPMENT CONNECTION, E.C. SHALL FURNISH AND INSTALL FINAL CONNECTION TO EQUIPMENT FURNISHED BY OTHERS.	
9	Ľ	DISCONNECT SWITCH, 240-VOLT, NON-FUSIBLE, GENERAL DUTY, LOCKABLE IN OFF POSITION, PROVIDE GROUND LUG, UL LISTED. COORDINATE ENCLOSURE NEMA TYPE WITH LOCATION. SIZE AND QUANTITY OF POLES SHALL MATCH EQUIPMENT DEVICE IS SERVING.	SQUARE 'D' CLASS 3110 CUTLER HAMMER SIEMENS GENERAL ELECTRIC
10	PANEL A	PANEL BOARD, NEMA 4X ENCLOSURE, GASKETED DOOR COVER CONSTRUCTION, 120/240 VOLT, 1 PHASE, 3 WIRE, COPPER BUS, SOLID NEUTRAL, GROUND BUS, SEE ONE LINE DIAGRAM AND PANEL SCHEDULE FOR ADDITIONAL INFORMATION. FURNISH AND INSTALL BREAKERS AS INDICATED ON THE PANEL SCHEDULE.	SQUARE 'D' NQ SERIES EATON/CUTLER-HAMMER GENERAL ELECTRIC SIEMENS

		LUMINAIRE SCHEDULE		
CALLOUT	SYMBOL	DESCRIPTION	MODEL	1
F1	0	CHAIN HUNG VANDAL RESISTANT, VAPOR-TIGHT, LINEAR LED FIXTURE WITH POLYCARBONATE HOUSING, CLEAR, UV-STABILIZED POLYCARBONATE LENS, STAINLESS STEEL LENS LATCHES, UNIVERSAL VOLTAGE ELECTRONIC DRIVER, AND 4000 INITIAL LUMEN OUTPUT AT 4100K.	LITHONIA VAP 39 LED CMB EATON HUBBELL	
F2	$\prec$	INDUSTRIAL 54"-56", 3-BLADE CEILING FAN, WITH 120 VOLT, 1-SPEED, THERMALLY PROTECTED, MOISTURE PROOF MOTOR, WHITE CAST IRON HOUSING, ALUMINUM BLADES, AND STEEL DOWNROD. MOUNT WITH MINIMUM 9' CLEARANCE FROM FLOOR. CONTROL WITH FAN SPEED CONTROL	NORTHWEST ENVIROFAN 190A-7 HUNTER DAYTON	4 5 6
F3	Ю	WALL MOUNTED LED EXTERIOR FIXTURE WITH CAST ALUMINUM OR POLYCARBONATE HOUSING, UV RESISTANT POLYCARBONATE LENS, PHOTO CELL, 1000 NOMINAL, INITIAL LUMENS AT 4000–4100K, 120 VOLT INPUT, AND BLACK OR DARK BRONZE FINISH	LITHONIA OLWP 11 PE BZ HUBBELL LUMARK	7 8 9

## LUMINAIRE SCHEDULE NOTES:

- CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS, MECHANICAL SYSTEM PLANS, DETAILS, SECTIONS, AND ELEVATIONS FOR AID IN COORDINATION OF FIXTURE LOCATIONS AND ANY INTERFERENCES.
- CONTRACTOR SHALL PROVIDE COPIES OF COMPLETE FIXTURE SCHEDULES, LIGHTING PLANS, AND LIGHTING SPECIFICATIONS TO ALL SUPPLIERS OR MANUFACTURERS' REPRESENTATIVES INVOLVED IN FIXTURE PRICING OR ORDERING, PRIOR TO BID.
- FIXTURES SHALL BE PROVIDED WITH FEATURES, OPTIONS, AND ACCESSORIES REQUIRED FOR COMPLETE INSTALLATION AND THOSE LISTED IN FIXTURE MODEL NUMBERS PROVIDED, SPECS., AND WRITTEN DESCRIPTION. IF CONFLICTS EXIST BETWEEN THESE, NOTIFY A/E FOR CLARIFICATION PRIOR TO BIDDING OR ORDERING.
- FIXTURE MANUFACTURERS LISTED ARE IN NO GENERAL ORDER AND DO NOT INDICATE ANY ORDER OF PREFERENCE. CONTRACTOR SHALL VERIFY LAMP TYPES INDICATED ARE COMPATIBLE WITH MANUFACTURERS' CURRENT MODEL FIXTURES SUBMITTED. NOTIFY A/E IMMEDIATELY OF DISCREPANCIES AND MAKE NECESSARY CORRECTIONS PRIOR TO
- BIDDING.
- PROVIDE #10 AWG CONDUCTORS FOR ALL EXTERIOR BUILDING LIGHTING CIRCUITS. ALL DRIVER AND LED COMBINATIONS SHALL BE CEE CERTIFIED.
- 3. ALL INTERIOR FIXTURE COLOR TEMPERATURES SHALL BE 4100K AND ALL EXTERIOR COLOR TEMPERATURES SHALL BE 4100K UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL LED FIXTURES SHALL INCLUDE A 5 YEAR REPLACEMENT WARRANTY ON LIGHT ENGINE(S), INCLUDING DRIVER(S).

	GENERAL ELECTRICAL NOTES:
1.	ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL CODES INCLUDING BUT NOT LIMITED TO THE NATIONAL ELECTRICAL CODE, THE INTERNATIONAL BUILDING CODE, AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES AND ASHRAE 90.1. THE AUTHORITY HAVING JURISDICTION SHALL HAVE THE FINAL DECISION ON ALL INSTALLATIONS AND REACTICES
2.	REFER TO THE MATERIAL SCHEDULE, LUMINAIRE SCHEDULE, AND OTHER ASSOCIATED SCHEDULES FOR
3.	ALL ELECTRICAL CONDUCTORS SHALL BE STRANDED COPPER WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE. THE MINIMUM WIRE SIZE SHALL BE #12 AWG.
4.	CIRCUIT IDENTIFICATION NUMBERS ARE TO COORDINATE CIRCUITING WITH THE ASSOCIATED PANEL. THE CIRCUIT NUMBERS SHALL BE FIELD MODIFIED TO BALANCE THE ELECTRICAL LOAD ON ALL THREE PHASES AS EVENLY AS POSSIBLE
5.	ALL CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
6.	A GREEN GROUNDING CONDUCTOR SHALL BE CONNECTED TO ALL LOADS SERVED. THE CONDUCTOR SHALL BE SIZED PER THE NATIONAL ELECTRICAL CODE TO ACCOMMODATE THE LOAD SERVED. ALL GROUNDING CONDUCTORS SHALL BE INSTALLED IN CONDUIT.
7.	ALL BUILDING WIRING SHALL BE INSTALLED IN CONDUIT. MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS OTHERWISE NOTED.
8.	MC CABLING IS NOT PERMITTED. ALL POWER CONDUCTORS SHALL BE IN CONDUIT.
9.	ALL CONDUITS SHALL BE CONCEALED IN WALLS, ABOVE CEILINGS, ETC. WHERE POSSIBLE. ALL CONDUIT ROUTED EXPOSED SHALL BE INSTALLED IN A WORKMAN—LIKE MANNER. ALL EXPOSED CONDUITS IN UNFINISHED AREAS SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO WALLS AND CEILINGS.
10.	COORDINATE THE EXACT LOCATION OF ALL DEVICES WITH OTHER TRADES, ARCHITECTURAL ELEVATIONS, AND REVIEWED SUBMITTALS PRIOR TO ROUGH-IN
11.	ALL CUTTING AND PATCHING REQUIRED FOR CONDUITS, DEVICES, OR OTHER ELECTRICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
12.	COORDINATE ALL MOUNTING OF ELECTRICAL EQUIPMENT REQUIRED FOR EQUIPMENT SUPPLIED BY OTHERS. EQUIPMENT SHALL BE MOUNTED TO AVOID ANY INTERFERENCE WITH OTHER EQUIPMENT OPERATION OR ACCESS. ALL INSTALLATIONS OF ELECTRICAL EQUIPMENT TO EQUIPMENT SUPPLIED BY OTHERS SHALL BE COORDINATED AND APPROVED BY SUPPLYING CONTRACTOR PRIOR TO ROUGH-IN.
13.	FLUSH MOUNT ALL TOGGLE SWITCHES 42" ABOVE THE FINISHED FLOOR TO THE CENTER OF THE DEVICE UNLESS OTHERWISE NOTED. FLUSH MOUNT ALL RECEPTACLES ABOVE THE FINISHED FLOOR TO THE CENTER OF THE DEVICE UNLESS OTHERWISE
14	NOIED. LINE TYPE KEY:
17.	aNEW WORK BY THE ELECTRICAL CONTRACTOR
	bNEW WORK BY OTHERS
	bDEMOLITION WORK BY ELECTRICAL CONTRACTOR
15.	INDICATES THE TYPE OF CONDUCTORS IN THE CONDUIT. VERIFY QUANTITY FOR EACH SPECIFIC LOAD SERVED.
	GROUND CONDUCTOR PHASE CONDUCTOR NEUTRAL CONDUCTOR
16	CONDUCTOR TICK MARKS INDICATER ON CONDUITS RO NOT REPRESENT THE QUANTITY OF CONDUCTORS IN THE

16. CONDUCTOR LICK MARKS INDICATED ON CONDUITS DO NOT REPRESENT THE QUANTITY OF CONDUCTORS IN THE CONDUIT, BUT THE TYPE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE REQUIRED QUANTITY OF GROUND, NEUTRAL, PHASE, AND SWITCH LEGS IN EACH CONDUIT.

