

**OFFICIAL BID DOCUMENT  
FOR  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
FFA LEADERSHIP TRAINING CENTER  
HARDINSBURG, KENTUCKY**

This Official Bid Document consisting of pages 1 through 14, shall be used in submitting a bid document for the work. Copies will be furnished upon request by the authority issuing the Contract Documents.

THIS BID DOCUMENT SUBMITTED BY \_\_\_\_\_

\_\_\_\_\_  
(Name and Address of Bidder)

DATE: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_

**TO:           SEALED BID CLERK  
403 WAPPING STREET, 2<sup>nd</sup> FLOOR  
ENGINEERING AND CONTRACT ADMINISTRATION  
COMMONWEALTH OF KENTUCKY  
FRANKFORT, KY 40601-2638  
PHONE: (502) 564-3050**

GENTLEMEN:

This Bidder, in compliance with your Request for Bid No. RFB-232-20, and having carefully examined the Drawings and complete Contract Documents as defined in Article 1 of the General Conditions as well as the Specifications for the work as prepared by White Pollard Architects; hereby proposes to furnish all labor, materials, supplies and services required to perform the specifics of the Contract Documents, within the time set forth therein and for the stated Lump Sum Bid Amount.

The Bidder hereby acknowledges receipt of the following Addenda:

ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____
ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____
ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____
ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____

**(IF NONE HAVE BEEN ISSUED AND RECEIVED, INSERT THE WORD NONE.)**

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**ALL BLANKS IN THE BID DOCUMENTS SHALL BE COMPLETED AND ALL REQUIRED SUPPORT DATA SHALL BE FURNISHED. IF INDICATED I N THE BIDDING DOCUMENTS, SUMS SHALL BE EXPRESSED IN BOTH WORDS AND FIGURES. IN THE CASE OF DESCREPANCY BETWEEN THE TWO, THE AMOUNT IN WORDS SHALL PREVAIL.**

**LUMP SUM BASE BID:**

The Bidder agrees to furnish all labor, materials, supplies and services required to complete this project defined as FFA Cabins, Shop and Miscellaneous Construction, FFA Leadership Training Center, Hardinsburg, Kentucky for the Department for Facilities and Support Services, Commonwealth of Kentucky, in accordance with the Drawings, Specifications, and Contract Documents, and any duly issued Addenda for the LUMP SUM BID AMOUNT set forth below:

**LUMP SUM BASE BID AMOUNT:**

\_\_\_\_\_ DOLLARS  
(USE WORDS)

\_\_\_\_\_ CENTS (\$ \_\_\_\_\_)  
(USE WORDS) (USE FIGURES)

**NOTE: THE AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST PAGE MUST BE PROPERLY EXECUTED FOR THE LUMP SUM BASE BID TO BE VALID.**

**OFFICIAL BID DOCUMENT**

**AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST**

**I, HEREBY CERTIFY:**

1. That I am the bidder (if the bidder is an individual), a partner in the bidder (if the bidder is a partnership), or an officer and employee of the bidding corporation having authority to sign on it's behalf (if the bidder is a corporation);
2. That the submitted bid or bids covering Division of Engineering and Contract Administration Request for Bid No. RFB-232-20 have been arrived at by the bidder independently and have been submitted without collusion with, and without any agreement, understanding or planned common course of action with any other contractor, vendor of materials, supplies, equipment or services described in the Request for Bid, designed to limit independent bidding or competition; as prohibited by provision KRS 45A.325;
3. That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder, its surety on any bond furnished with the bid or bids and will not be communicated to any such person prior to the official opening of the bid or bids.
4. That the bidder is legally entitled to enter into the contract with the Commonwealth of Kentucky and is not in violation of any prohibited conflict of interest, including those prohibited by the provisions of KRS 164.390; and 45A.330 to 45A.340 and 45A.455;
5. This offer is for thirty (30) calendar days from the date this bid is opened. In submitting the above it is expressly agreed that upon proper acceptance by the Division of Engineering and Contract Administration of any or all items bid above, a contract shall thereby be created with respect to the items accepted;
6. That I have fully informed myself regarding and affirm the accuracy of all statements made in this Official Bid Document including Bid Amount.
7. Unless otherwise exempted by KRS 45.590, the bidder intends to comply in full with all requirements of the Kentucky Civil Rights Act and to submit data required by the Kentucky Equal Employment Act upon being designated the successful bidder.
8. That the bidder, if awarded a contract, would not be in violation of the Executive Branch Code of Ethics established by KRS 11A.001 through KRS 11A.990.
9. That the bidder is not debarred from doing business with federal agencies and that, if debarred during the life of the contract, the bidder will notify the Commonwealth buyer of record within seventy-two (72) hours of the federal debarment.

READ CAREFULLY – SIGN IN SPACE BELOW – FAILURE TO SIGN INVALIDATES BID

**SIGNED BY:** \_\_\_\_\_

**FIRM:** \_\_\_\_\_

**PRINT NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**CITY** \_\_\_\_\_ **STATE** \_\_\_\_\_ **ZIP CODE** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**TELEPHONE NO:** \_\_\_\_\_

**FEDERAL ID. NO. OR SOCIAL SECURITY NO.** \_\_\_\_\_

**EMAIL:** \_\_\_\_\_

**\*Disadvantaged Contractors, check type of certification:**

☐ WBE ☐ MBE ☐ DBE ☐ SERVICE-DISABLED VETERAN

**\*Disadvantaged Contractors attach a copy of certification.**

**OFFICIAL BID DOCUMENT – SUBMITTAL DATA**

**THE FOLLOWING ITEMS ARE HEREWITH ENCLOSED AS REQUIRED:**

- ☐ Sworn Required Affidavit For Bidders, Offerors And Contractors
- ☐ Sworn Affidavit for Claiming Resident Bidder Status
- ☐ Vendor Report of Prior Violations of KRS Chapters, 136, 139, 141, 337, 338, 341 and 342.
- ☐ Bidder's Qualifications.
- ☐ Disadvantaged Business Enterprises (DBE) Participation

The utilization of minority/disadvantaged vendors and subcontractors is encouraged, whenever possible, on public projects. The bidder and contractor should make full efforts to locate disadvantaged business persons.

Bidders may use the following resources:

Commonwealth of Kentucky's SMALL BUSINESS CONNECTION website: <https://secure.kentucky.gov/sbc/default.aspx>

Kentucky Minority and Women Business Enterprise website: <https://mwbe.ky.gov/Pages/default.aspx>

Kentucky Service-Disabled Veteran-Owned Small Business website:

<https://finance.ky.gov/initiatives/sdvosb/Pages/default.aspx>

Kentucky Transportation Cabinet Disadvantaged Business Enterprise directories: <http://transportation.ky.gov/Civil-Rights-and-Small-Business-Development/Pages/Certified-DBE-Directory.aspx>

Finance and Administration Cabinet, Office of EEO/Contract Compliance: email [Finance.ContractCompliance@ky.gov](mailto:Finance.ContractCompliance@ky.gov) or call 502-564-2874

U.S. Small Business Administration, Dynamic Small Business Search website: [http://dsbs.sba.gov/dsbs/search/dsp\\_dsbs.cfm](http://dsbs.sba.gov/dsbs/search/dsp_dsbs.cfm)

Louisville/ Jefferson County Metropolitan Sewer District website: <http://www.msdlouky.org/insidemsd/diverse/find.html>

A bidder must include a list of all disadvantaged vendors and/or subcontractors contacted in order to prepare a bid (ATTACH TO OFFICIAL BID DOCUMENT).

If the bidder fails to utilize any disadvantaged vendors and/or subcontractors, a statement must be included to describe actions to include disadvantaged vendors and/or subcontractors (ATTACH TO OFFICIAL BID DOCUMENT).

The Finance and Administration Cabinet will review all submissions by bidders to determine compliance with this provision.

- ☐ List of Unit Prices, if applicable
- ☐ List of Subcontractors, if applicable
- ☐ List of Materials and Equipment, if applicable
- ☐ Bid Guaranty in the amount of no less than five percent (5%) of the TOTAL BID AMOUNT.
- ☐ Roofing Certifications, if applicable.

**COMMONWEALTH OF KENTUCKY  
FINANCE AND ADMINISTRATION CABINET  
SWORN STATEMENT REGARDING CAMPAIGN FINANCE LAWS  
PURSUANT TO KRS 45A.110 AND KRS 45A.115**

The following form (page 5) relative to Campaign Finance Laws shall be completed in total, notarized and returned with your bid. Responsibility of a bidder or offeror for a contract award shall not be made until the bidder or offeror provides this sworn statement.



## **REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS**

### **FOR BIDS AND CONTRACTS IN GENERAL:**

- I. Each bidder or offeror swears and affirms under penalty of perjury, that:
- a. In accordance with [KRS 45A.110](#) and [KRS 45A.115](#), neither the bidder or offeror as defined in [KRS 45A.070\(6\)](#), nor the entity which he/she represents, has knowingly violated any provisions of the campaign finance laws of the Commonwealth of Kentucky; and the award of a contract to the bidder or offeror or the entity which he/she represents will not violate any provisions of the campaign finance laws of the Commonwealth.
  - b. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and all subcontractors therein, are aware of the requirements and penalties outlined in [KRS 45A.485](#); have properly disclosed all information required by this statute; and will continue to comply with such requirements for the duration of any contract awarded.
  - c. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and its affiliates, are duly registered with the Kentucky Department of Revenue to collect and remit the sales and use tax imposed by [KRS Chapter 139](#), and will remain registered for the duration of any contract awarded.
  - d. The bidder or offeror swears and affirms under penalty of perjury that the entity bidding is not delinquent on any state taxes or fees owed to the Commonwealth of Kentucky and will remain in good standing for the duration of any contract awarded.
  - e. Pursuant to [KRS 45A.480](#) the bidder or offeror swears and affirms under penalty of perjury, that all contractors and subcontractors employed, or that will be employed, under the provisions of this contract shall be in compliance with the requirements for worker's compensation insurance according to [KRS Chapter 342](#) and unemployment insurance according to [KRS Chapter 341](#).
  - f. The bidder or offeror swears and affirms under penalty of perjury that the entity bidding is properly authorized under the laws of the Commonwealth of Kentucky to conduct business in this state; is duly registered with the Kentucky Secretary of State to the extent required by Kentucky law; and will remain in good standing to do business in the Commonwealth of Kentucky for the duration of any contract awarded.
  - g. By his signature, the offeror certifies that he is legally entitled to enter into this contract with the Commonwealth of Kentucky, and by holding and performing this contract will not be violating any conflict-of-interest statute ([KRS 45A.330](#), [KRS 45A.335](#), [KRS 45.340](#), [KRS 45A.990](#), [KRS 164.390](#)) or [KRS 11A.040](#) of the Executive Branch Code of Ethics, relating to employment of former public servants.

### **FOR "NON-BID" CONTRACTS (I.E. SOLE-SOURCE; NOT-PRACTICAL OR FEASIBLE TO BID; OR EMERGENCY CONTRACTS, ETC):**

- II. Each contractor further swears and affirms under penalty of perjury, that:
- a. In accordance with [KRS 121.056](#), and if this is a non-bid contract, neither the contractor, nor any member of his/her immediate family having an interest of 10% or more in any business entity involved in the performance of any contract awarded, have contributed more than the amount specified in [KRS 121.150](#) to the campaign of the gubernatorial slate elected in the election last preceding the date of contract award.
  - b. In accordance with [KRS 121.330\(1\) and \(2\)](#), and if this is a non-bid contract, neither the contractor, nor officers or employees of the contractor or any entity affiliated with the contractor, nor the spouses of officers or employees of the contractor or any entity affiliated with the contractor, have knowingly contributed more than \$5,000 in aggregate to the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract award.
  - c. In accordance with [KRS 121.330\(3\) and \(4\)](#), and if this is a non-bid contract, to the best of his/her knowledge, neither the contractor, nor any member of his/her immediate family, his/her employer, or his/her employees, or any entity affiliated with any of these entities or individuals, have directly solicited contributions in excess of \$30,000 in the aggregate for the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract.

**REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS**

As a duly authorized representative for the bidder, offeror, or contractor, I have fully informed myself regarding the accuracy of all statements made in this affidavit, and acknowledge that the Commonwealth is reasonably relying upon these statements, in making a decision for contract award and any failure to accurately disclose such information may result in contract termination, repayment of funds and other available remedies under law.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

Company Name

Address

Subscribed and sworn to before me by

\_\_\_\_\_  
(Affiant)

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

of \_\_\_\_\_ this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.  
(Company Name)

\_\_\_\_\_  
Notary Public

[seal of notary]

My commission expires: \_\_\_\_\_

**REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS CLAIMING RESIDENT BIDDER STATUS****FOR BIDS AND CONTRACTS IN GENERAL:**

The bidder or offeror hereby swears and affirms under penalty of perjury that, in accordance with KRS 45A.494(2), the entity bidding is an individual, partnership, association, corporation, or other business entity that, on the date the contract is first advertised or announced as available for bidding:

1. Is authorized to transact business in the Commonwealth;
2. Has for one year prior to and through the date of advertisement
  - a. Filed Kentucky income taxes;
  - b. Made payments to the Kentucky unemployment insurance fund established in KRS 341.49; and
  - c. Maintained a Kentucky workers' compensation policy in effect.

The BIDDING AGENCY reserves the right to request documentation supporting a bidder's claim of resident bidder status. Failure to provide such documentation upon request shall result in disqualification of the bidder or contract termination.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

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

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Subscribed and sworn to before me by \_\_\_\_\_  
(Affiant) (Title)

of \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.  
(Company Name)

\_\_\_\_\_  
Notary Public

[seal of notary]

My commission expires: \_\_\_\_\_

[illegible]

### BIDDER'S QUALIFICATIONS

The Bidder's Qualifications are required by the owner to be submitted as set forth herewith:

1. This firm is a Corp.\_\_\_\_\_, Partnership\_\_\_\_\_, or Proprietorship\_\_\_\_\_.
2. A permanent place of business is maintained at:

STREET	CITY	STATE	ZIP CODE
--------	------	-------	----------

TELEPHONE NUMBER

3. The following construction plant and equipment will be made available for use on this contract:

4. In the event the contract is awarded the undersigned, surety bonds will be furnished by:

5. Experience of Contractor on other similar work:

6. We now have the following jobs under contract and bonded:

JOB	TOTAL CONTRACT	PERCENT COMPLETED
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %

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**DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION**

- 1.01 **CERTIFICATION OF DBE:** Any DBE utilized pursuant to this Section shall be certified as a DBE by one of the following: Kentucky Finance and Administration Cabinet, Kentucky Transportation Cabinet or other state Transportation agencies, the Louisville/Jefferson County Metropolitan Sewer District, the Tri-State Minority Supplier Development Council or other state Minority Supplier Development Councils, the Ohio River Valley Women's Business Council, the Women's Business Enterprise National Council, the National Women Business Owners Council, or the Small Business Administration.
- 1.02 **OBLIGATION OF BIDDER/CONTRACTOR:** Bidder/Contractor shall make a good faith effort to meet the DBE contract goal set by the Commonwealth by including DBE's as subcontractors and/or material suppliers on 10% of the total estimated cost of the Contract. The failure to meet the foregoing goal shall not result in disqualification from bidding or being awarded a contract. However, Bidders/Contractors not meeting the DBE goal shall be expected to provide written proof of their good faith efforts. Award of the contract shall be conditioned upon satisfaction of the requirements established by this section. The Bidder/Contractor shall attempt to divide the work in the contract to facilitate use of DBE's (however, there is no requirement that the work be artificially divided or divided in a way that raises the bid price of the Bidder/Contractor).
- 1.03 **PROOF REQUIRED:** Each bidder shall furnish written proof in their bid package that they reached the DBE participation goal for this Contract, or of their good faith efforts to meet the DBE participation goal. A copy of each participating DBE's certification shall accompany the required forms. All submissions shall be subject to verification of the Commonwealth.
- A. Proof that the apparent successful bidder reached the DBE goal shall consist of the following and shall be made on form DB-2-A, attached hereto:
1. The names and addresses of DBE firms that will participate in the contract;
  2. A description of the work each named DBE firm will perform;
  3. The dollar amount of participation by each named DBE firm;
  4. The percentage amount of participation by each named DBE firm;
- B. Proof that the apparent successful bidder made a good faith efforts to meet the DBE participation goal may include the following:
1. Advertisement by the Bidder/Contractor of DBE contracting opportunities associated with this contract in at least one of each of the following periodicals: a periodical in general circulation throughout the Commonwealth, a trade periodical focused on DBE contractors/suppliers in general circulation throughout the Commonwealth, and a minority-focused periodical in general circulation throughout the Commonwealth. The Bidder/Contractor shall include copies of the dated advertisements in his bid package;
  2. Written notice of DBE opportunities in this contract to at least five pertinent DBE's at least seven days prior to the bid opening date. Copies of the written notices shall be included in the bid package;
  3. The Bidder/Contractor's response(s) to those DBE's who requested plans, specifications and/or contracting requirements. Copies of said responses shall be included in the bid package;
  4. Documentation on form DB-2-B of good faith negotiations with at least three DBE's, with no rejection of a qualified DBE without sound reason, including price quotes that are above other subcontractor's price quotes;
  5. Utilization of the Finance and Administration Cabinet's Office of Equal Employment Opportunity and Contract Compliance for referrals to organizations that assist in locating DBE's. Proof of use of such referrals and contacts made as a result thereof shall be included in the bid package.

DB-2-A

**DISADVANTAGED BUSINESS AVAILABILITY VERIFICATION**

\_\_\_\_\_ does commit itself that on the following project:  
NAME OF COMPANY

PROJECT NAME REQUEST FOR BID NUMBER

The Bidder agrees to furnish information required by the Commonwealth of Kentucky to indicate the Disadvantaged Business which it intends to utilize. Breach of this commitment constitutes breach of the Bidder's contract if awarded.

NAME OF DISADVANTAGED BUSINESS	TELEPHONE	TYPE OF WORK

DOLLAR VALUE	PERCENT	DISADVANTAGED CLASSIFICATION

The undersigned shall enter into a formal agreement with the Disadvantaged business firms for work listed in this schedule conditioned upon execution of a contract with the Commonwealth of Kentucky.

Disadvantaged business firms listed above by the Bidder and accepted by the Owner and the Architect/Engineer shall be used on the work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect/Engineer. The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

Signature and title of authorized official of the company and the data shall be properly executed on this document or the bid will be deemed nonresponsive.

NAME OF AUTHORIZED OFFICER TITLE

SIGNATURE DATE

If you are bidding as a General Contractor on this project i.e. direct bidding and a Disadvantaged as defined herein, please provide a copy of your DBE Certification.

Submit with Bid.  
(Please copy additional Disadvantaged Business Availability Forms as necessary.)

DB-2-B

DISADVANTAGED BUSINESS UNAVAILABILITY VERIFICATION

I, \_\_\_\_\_, \_\_\_\_\_ (TITLE)  
of \_\_\_\_\_  
(PRIME BIDDER)

certify that on \_\_\_\_\_ I contacted the following Disadvantaged owned business by: (circle one) Certified Mail, Phone, In Person to obtain a bid for work items to be performed on the Contract.

DISADVANTAGED CLASSIFICATION (IE. WBE, MBE, DBE, SDVOSB) CONTRACTOR	WORK ITEMS SOUGHT	FORM OF BID SUPPORT (IE., UNIT PRICE, MATERIALS LABOR & LABOR ONLY)

To the best of my knowledge and belief, said Disadvantaged owned business was unavailable (exclusive of unavailability due to lack of agreement on price) for work on this project, or unable to prepare a bid, for the following reason(s):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

\_\_\_\_\_ was offered an  
(NAME OF DISADVANTAGED BUSINESS)

opportunity to bid on the above-identified work on \_\_\_\_\_ by

\_\_\_\_\_  
(SOURCE)

The above statement is a true and accurate account of why I did not submit a bid on this project.

\_\_\_\_\_  
(SIGNATURE OF DISADVANTAGED BUSINESS)

\_\_\_\_\_  
(TITLE) (DATE)

Submit with Bid if Applicable.  
(Please copy additional Disadvantaged Business Unavailability Forms as needed.)



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**LIST OF PROPOSED SUBCONTRACTORS:**  
**(Must be submitted with Bid)**

The following list of proposed subcontractors is required by the owner to be executed, completed, and submitted with the Bidder's Proposal. All subcontractors are subject to approval by the Division of Engineering and Contract Administration, Department of Facilities and Support Services, Frankfort, Kentucky. Failure to submit this list, completely filled out, may result in bid rejection.

If certain branches of work are to be done by the Prime Contractor, so state. Review/evaluation of subcontractors will occur on the bid opening day. If the Commonwealth requests replacement of a subcontractor, on bid opening day, then the apparent low bidder will provide a replacement subcontractor prior to close of the Commonwealth's business day on that day. Failure of the apparent low bidder to comply with the preceding sentence may result in bid rejection. If subcontractor review/evaluation is not completed on the bid opening day, then procedures for any replacement will be issued based on the uniqueness of each situation. The responsibility for selection, offering of qualified, competent subcontractors to accomplish the work intended is solely the responsibility of the bidder to the Commonwealth.

**ALL BLANKS MUST BE FILLED IN. IF PERFORMED BY THE BIDDER, STATE PRIME/GENERAL CONTRACTOR.**

	<b>BRANCH OF WORK</b>	<b>NAME OF SUBCONTRACTOR</b>
1.	Rough & Finish Carpentry	
2.	Doors, Frames & Hardware	
3.	Painting	
4.	Pole Building	
5.	Plumbing	
6.	Electric	

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**LIST OF MATERIALS AND EQUIPMENT (MUST BE COMPLETELY FILLED OUT WHEN BID IS SUBMITTED):**

Every item listed under the different phases of construction must be clearly identified so that the Owner will definitely know what the bidder proposes to furnish. Bidders be hereby advised that this list is required by the owner to be executed, completed, and submitted with the Bidder's Proposal.

The use of the manufacturer's dealer's name only, or stating "as per plans and specifications", will not be considered as sufficient identification.

Where more than one "Make or Brand" is listed for any one item, the Owner has the right to select the one to be used.

Failure to submit a proper list may result in rejection of Bidder's Proposal.

	<b>MATERIAL AND/OR EQUIPMENT:</b>	<b>MANUFACTURER AND BRAND NAME:</b>
1.	Packaged Terminal Air Conditioners (PTAC)	
2.	Ductless Split Systems	
3.	Plumbing Fixtures	
4.	Water Heater	
5.	Electric Panels	
6.	Light Fixtures	
7.	Wiring Devices	

**FINANCE AND ADMINISTRATION  
DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES  
DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION**



**REQUEST FOR BID NO. RFB-232-20  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
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**Agency: 540**

**Fund: C97Q**



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**HARDINSBURG, KENTUCKY**

OFFICIAL BID DOCUMENT
NOTICE TO CONTRACTORS
MOVEIT INSTRUCTIONS
PART I ADVERTISEMENT FOR BIDS
PART II INSTRUCTIONS TO BIDDERS
PART III GENERAL CONDITIONS
PART IV PAYMENT BOND
PART V PERFORMANCE BOND
PART VI AGREEMENT BETWEEN OWNER AND CONTRACTOR
SPECIFICATIONS

**PLEASE NOTE THE FOLLOWING:**

THE VENDOR VIOLATION FORM IN THE BID DOCUMENTS IS BEING SENT TO THE LABOR CABINET FOR VERIFICATION. PLEASE MAKE SURE ALL YOUR VIOLATIONS ARE LISTED WITHIN THE LAST FIVE (5) YEARS. IF A BIDDER LISTS "NONE" AND HAS SOME, THEIR BID MAY BE REJECTED. FOR A LIST OF YOUR VENDOR VIOLATIONS, YOU CAN FAX OR EMAIL THE LABOR CABINET WITH YOUR REQUEST. FAX NUMBER IS (502) 696-1984 OR EMAIL: [wages@ky.gov](mailto:wages@ky.gov). CONTRACTORS MUST ALLOW THREE (3) DAYS IN ORDER TO GET INFORMATION FROM THE LABOR CABINET.

THERE IS A CHECKLIST ON PAGE 4 OF THE OFFICIAL BID DOCUMENT FOR CONTRACTORS TO MAKE SURE ALL OF BID DOCUMENT IS ENCLOSED WHEN SUBMITTING THEIR BID.

**IMPORTANT:** Be prepared for temperature checks at various state agency entry points. If you have a fever, you will be turned away. Face masks are also required by employees/contractors when working, traveling or meeting in groups or in common areas (breakrooms, hallways, etc.)

**Contractors must load their Bid Documents under the corresponding RFB in MOVEit in order for it to be received. IF BID IS NOT UPLOADED IN THE CORRECT FOLDER IN MOVEit, THE BID WILL BE DEEMED NON-RESPONSIVE.**

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THIS BID DOCUMENT SUBMITTED BY \_\_\_\_\_

\_\_\_\_\_  
(Name and Address of Bidder)

DATE: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_

**TO:           SEALED BID CLERK  
403 WAPPING STREET, 2<sup>nd</sup> FLOOR  
ENGINEERING AND CONTRACT ADMINISTRATION  
COMMONWEALTH OF KENTUCKY  
FRANKFORT, KY 40601-2638  
PHONE: (502) 564-3050**

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ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____
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ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____
ADDENDUM NO. _____	DATED _____	ADDENDUM NO. _____	DATED _____

**(IF NONE HAVE BEEN ISSUED AND RECEIVED, INSERT THE WORD NONE.)**

**OFFICIAL BID DOCUMENT  
FOR  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
FFA LEADERSHIP TRAINING CENTER  
HARDINSBURG, KENTUCKY**

**ALL BLANKS IN THE BID DOCUMENTS SHALL BE COMPLETED AND ALL REQUIRED SUPPORT DATA SHALL BE FURNISHED. IF INDICATED IN THE BIDDING DOCUMENTS, SUMS SHALL BE EXPRESSED IN BOTH WORDS AND FIGURES. IN THE CASE OF DISCREPANCY BETWEEN THE TWO, THE AMOUNT IN WORDS SHALL PREVAIL.**

**LUMP SUM BASE BID:**

The Bidder agrees to furnish all labor, materials, supplies and services required to complete this project defined as FFA Cabins, Shop and Miscellaneous Construction, FFA Leadership Training Center, Hardinsburg, Kentucky for the Department for Facilities and Support Services, Commonwealth of Kentucky, in accordance with the Drawings, Specifications, and Contract Documents, and any duly issued Addenda for the LUMP SUM BID AMOUNT set forth below:

**LUMP SUM BASE BID AMOUNT:**

\_\_\_\_\_ DOLLARS  
(USE WORDS)

\_\_\_\_\_ CENTS \_\_\_\_\_  
(USE WORDS) (USE FIGURES)

**NOTE: THE AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST PAGE MUST BE PROPERLY EXECUTED FOR THE LUMP SUM BASE BID TO BE VALID.**

**OFFICIAL BID DOCUMENT**

**AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST**

**I, HEREBY CERTIFY:**

1. That I am the bidder (if the bidder is an individual), a partner in the bidder (if the bidder is a partnership), or an officer and employee of the bidding corporation having authority to sign on it's behalf (if the bidder is a corporation);
2. That the submitted bid or bids covering Division of Engineering and Contract Administration Request for Bid No. RFB-232-20 have been arrived at by the bidder independently and have been submitted without collusion with, and without any agreement, understanding or planned common course of action with any other contractor, vendor of materials, supplies, equipment or services described in the Request for Bid, designed to limit independent bidding or competition; as prohibited by provision KRS 45A.325;
3. That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder, its surety on any bond furnished with the bid or bids and will not be communicated to any such person prior to the official opening of the bid or bids.
4. That the bidder is legally entitled to enter into the contract with the Commonwealth of Kentucky and is not in violation of any prohibited conflict of interest, including those prohibited by the provisions of KRS 164.390; and 45A.330 to 45A.340 and 45A.455;
5. This offer is for thirty (30) calendar days from the date this bid is opened. In submitting the above it is expressly agreed that upon proper acceptance by the Division of Engineering and Contract Administration of any or all items bid above, a contract shall thereby be created with respect to the items accepted.
6. That I have fully informed myself regarding and affirm the accuracy of all statements made in this Official Bid Document including Bid Amount.
7. Unless otherwise exempted by KRS 45.590, the bidder intends to comply in full with all requirements of the Kentucky Civil Rights Act and to submit data required by the Kentucky Equal Employment Act upon being designated the successful bidder.
8. That the bidder, if awarded a contract, would not be in violation of the Executive Branch Code of Ethics established by KRS 11A.001 through KRS 11A.990.
9. That the bidder is not debarred from doing business with federal agencies and that, if debarred during the life of the contract, the bidder will notify the Commonwealth of record within seventy-two (72) hours of the federal debarment.

READ CAREFULLY – SIGN IN SPACE BELOW – FAILURE TO SIGN INVALIDATES BID

**SIGNED BY:** \_\_\_\_\_

**FIRM:** \_\_\_\_\_

**PRINT NAME:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**CITY** \_\_\_\_\_ **STATE** \_\_\_\_\_ **ZIP CODE** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**TELEPHONE NO:** \_\_\_\_\_

**FEDERAL ID. NO. OR SOCIAL SECURITY NO.** \_\_\_\_\_

**EMAIL:** \_\_\_\_\_

**\*Disadvantaged Contractors, check type of certification:**

☐ WBE ☐ MBE ☐ DBE ☐ SERVICE-DISABLED VETERAN

**\*Disadvantaged Contractors attach a copy of certification.**

**OFFICIAL BID DOCUMENT – SUBMITTAL DATA**

**THE FOLLOWING ITEMS ARE HEREWITH ENCLOSED AS REQUIRED:**

- ☐ Sworn Required Affidavit For Bidders, Offerors And Contractors
- ☐ Sworn Affidavit for Claiming Resident Bidder Status
- ☐ Vendor Report of Prior Violations of KRS Chapters, 136, 139, 141, 337, 338, 341 and 342.
- ☐ Bidder's Qualifications.
- ☐ Disadvantaged Business Enterprises (DBE) Participation

The utilization of minority/disadvantaged vendors and subcontractors is encouraged, whenever possible, on public projects. The bidder and contractor should make full efforts to locate disadvantaged business persons.

Bidders may use the following resources:

Commonwealth of Kentucky's SMALL BUSINESS CONNECTION website: <https://secure.kentucky.gov/sbc/default.aspx>

Kentucky Minority and Women Business Enterprise website: <https://mwbe.ky.gov/Pages/default.aspx>

Kentucky Service-Disabled Veteran-Owned Small Business website:

<https://finance.ky.gov/initiatives/sdvosb/Pages/default.aspx>

Kentucky Transportation Cabinet Disadvantaged Business Enterprise directories: <http://transportation.ky.gov/Civil-Rights-and-Small-Business-Development/Pages/Certified-DBE-Directory.aspx>

Finance and Administration Cabinet, Office of EEO/Contract Compliance: email [Finance.ContractCompliance@ky.gov](mailto:Finance.ContractCompliance@ky.gov) or call 502-564-2874

U.S. Small Business Administration, Dynamic Small Business Search website: [http://dsbs.sba.gov/dsbs/search/dsp\\_dsbs.cfm](http://dsbs.sba.gov/dsbs/search/dsp_dsbs.cfm)

Louisville/ Jefferson County Metropolitan Sewer District website: <http://www.msdlbky.org/insidemsd/diverse/find.html>

A bidder must include a list of all disadvantaged vendors and/or subcontractors contacted in order to prepare a bid (ATTACH TO OFFICIAL BID DOCUMENT).

If the bidder fails to utilize any disadvantaged vendors and/or subcontractors, a statement must be included to describe actions to include disadvantaged vendors and/or subcontractors (ATTACH TO OFFICIAL BID DOCUMENT).

The Finance and Administration Cabinet will review all submissions by bidders to determine compliance with this provision.

- ☐ List of Unit Prices, if applicable
- ☐ List of Subcontractors, if applicable
- ☐ List of Materials and Equipment, if applicable
- ☐ Bid Guaranty in the amount of no less than five percent (5%) of the TOTAL BID AMOUNT.
- ☐ Roofing Certifications, if applicable

**COMMONWEALTH OF KENTUCKY  
FINANCE AND ADMINISTRATION CABINET  
SWORN STATEMENT REGARDING CAMPAIGN FINANCE LAWS  
PURSUANT TO KRS 45A.110 AND KRS 45A.115**

The following form (page 5) relative to Campaign Finance Laws shall be completed in total, notarized and returned with your bid. Responsibility of a bidder or offeror for a contract award shall not be made until the bidder or offeror provides this sworn statement.



## **REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS**

### **FOR BIDS AND CONTRACTS IN GENERAL:**

I. Each bidder or offeror swears and affirms under penalty of perjury, that:

- a. In accordance with [KRS 45A.110](#) and [KRS 45A.115](#), neither the bidder or offeror as defined in [KRS 45A.070\(6\)](#), nor the entity which he/she represents, has knowingly violated any provisions of the campaign finance laws of the Commonwealth of Kentucky; and the award of a contract to the bidder or offeror or the entity which he/she represents will not violate any provisions of the campaign finance laws of the Commonwealth.
- b. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and all subcontractors therein, are aware of the requirements and penalties outlined in [KRS 45A.485](#); have properly disclosed all information required by this statute; and will continue to comply with such requirements for the duration of any contract awarded.
- c. The bidder or offeror swears and affirms under penalty of perjury that, to the extent required by Kentucky law, the entity bidding, and its affiliates, are duly registered with the Kentucky Department of Revenue to collect and remit the sales and use tax imposed by [KRS Chapter 139](#), and will remain registered for the duration of any contract awarded.
- d. The bidder or offeror swears and affirms under penalty of perjury that the entity bidding is not delinquent on any state taxes or fees owed to the Commonwealth of Kentucky and will remain in good standing for the duration of any contract awarded.
- e. Pursuant to [KRS 45A.480](#) the bidder or offeror swears and affirms under penalty of perjury, that all contractors and subcontractors employed, or that will be employed, under the provisions of this contract shall be in compliance with the requirements for worker's compensation insurance according to [KRS Chapter 342](#) and unemployment insurance according to [KRS Chapter 341](#).
- f. The bidder or offeror swears and affirms under penalty of perjury that the entity bidding is properly authorized under the laws of the Commonwealth of Kentucky to conduct business in this state; is duly registered with the Kentucky Secretary of State to the extent required by Kentucky law, and will remain in good standing to do business in the Commonwealth of Kentucky for the duration of any contract awarded.
- g. By his signature, the offeror certifies that he is legally entitled to enter into this contract with the Commonwealth of Kentucky, and by holding and performing this contract will not be violating any conflict-of-interest statute ([KRS 45A.330](#), [KRS 45A.335](#), [KRS 45.340](#), [KRS 45A.990](#), [KRS 164.390](#), or [KRS 11A.040](#) of the Executive Branch Code of Ethics, relating to employment of former public servants.

### **FOR "NON-BID" CONTRACTS (I.E. SOLE SOURCE, NOT-PRACTICAL OR FEASIBLE TO BID; OR EMERGENCY CONTRACTS, ETC):**

II. Each contractor further swears and affirms under penalty of perjury, that:

- a. In accordance with [KRS 121.056](#), and if this is a non-bid contract, neither the contractor, nor any member of his/her immediate family having an interest of 10% or more in any business entity involved in the performance of any contract awarded, have contributed more than the amount specified in [KRS 121.150](#) to the campaign of the gubernatorial slate elected in the election last preceding the date of contract award.
- b. In accordance with [KRS 121.330\(1\) and \(2\)](#), and if this is a non-bid contract, neither the contractor, nor officers or employees of the contractor or any entity affiliated with the contractor, nor the spouses of officers or employees of the contractor or any entity affiliated with the contractor, have knowingly contributed more than \$5,000 in aggregate to the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract award.
- c. In accordance with [KRS 121.330\(3\) and \(4\)](#), and if this is a non-bid contract, to the best of his/her knowledge, neither the contractor, nor any member of his/her immediate family, his/her employer, or his/her employees, or any entity affiliated with any of these entities or individuals, have directly solicited contributions in excess of \$30,000 in the aggregate for the campaign of a candidate elected in the election last preceding the date of contract award that has jurisdiction over this contract.

**REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS**

As a duly authorized representative for the bidder, offeror, or contractor, I have fully informed myself regarding the accuracy of all statements made in this affidavit, and acknowledge that the Commonwealth is reasonably relying upon these statements, in making a decision for contract award and any failure to accurately disclose such information may result in contract termination, repayment of funds and other available remedies under law.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

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

Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Subscribed and sworn to before me by \_\_\_\_\_

(Affiant)

of \_\_\_\_\_

(Company Name)

this \_\_\_\_\_ day of \_\_\_\_\_

\_\_\_\_\_  
Notary Public

[seal of notary]

My commission expires: \_\_\_\_\_

**REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS CLAIMING RESIDENT BIDDER STATUS**

**FOR BIDS AND CONTRACTS IN GENERAL:**

The bidder or offeror hereby swears and affirms under penalty of perjury that, in accordance with KRS 45A.494(2), the entity bidding is an individual, partnership, association, corporation, or other business entity that, on the date the contract is first advertised or announced as available for bidding:

1. Is authorized to transact business in the Commonwealth;
2. Has for one year prior to and through the date of advertisement
  - a. Filed Kentucky income taxes;
  - b. Made payments to the Kentucky unemployment insurance fund established in KRS 341.49; and
  - c. Maintained a Kentucky workers' compensation policy in effect.

The BIDDING AGENCY reserves the right to request documentation supporting a bidder's claim of resident bidder status. Failure to provide such documentation upon request shall result in disqualification of the bidder or contract termination.

Signature \_\_\_\_\_ Printed Name \_\_\_\_\_

Title \_\_\_\_\_ Date \_\_\_\_\_

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

Address \_\_\_\_\_

Subscribed and sworn to before me by \_\_\_\_\_ (Affiant) \_\_\_\_\_ (Title)

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

(Company Name)

Notary Public \_\_\_\_\_

[seal of notary] My commission expires: \_\_\_\_\_

**SAMPLE**  
**DO NOT USE FOR BIDDING**

## VENDOR REPORT OF PRIOR VIOLATIONS ON CONSTRUCTION SEALED BIDS

This form is applicable to all sealed bids for construction projects issued by the Finance and Administration Cabinet, Division of Engineering and Contract Administration (DECA) in accordance with KRS 45A.080.

The **Prime Bidder** on any construction sealed bid **shall** provide the required information attached, for the Prime Bidder, as **an attachment to the bid**.

The information required is specifically - **any violations issued within the last five (5) calendar years of the following:**

1. Violations of KRS Chapter 136 (Corporation and Utility Taxes);
1. Violations of KRS Chapter 139 (Sales and Use Taxes);
2. Violations of KRS Chapter 141 (Income Taxes);
3. Violations of KRS Chapter 337 (Wages and Hours);
4. Violations of KRS Chapter 338 (Occupational Safety and Health of Employees);
5. Violations of KRS Chapter 341 (Unemployment Insurance);
6. Violations of KRS Chapter 342 (Workers Compensation); and
7. Violations of Occupational Safety and Health Laws **in any other states and at the federal level.**

If there are no violations for a particular category, vendor should attach a statement to that effect.

If there are violations for a particular category, the vendor should list them and provide the following information for each: the date of the violation, a short description of the violation (including statutory citation), the name of the governmental enforcement agency involved, and the amount of any penalties imposed as a result of the final determination.

Please note that this information may be provided to other governmental agencies, such as the Kentucky Labor Cabinet, as part of the bid process. DECA reserves the unqualified right to disqualify any vendors from participating further in this bid process.

In addition, the successful prime bidder and subcontractors shall remain in continuous compliance with KRS 45A.485 during the life of any contract awarded, and shall notify DECA of any new final determinations of violations in **any** of the above-mentioned categories, which occur after contract award, and during the life of any contract awarded. Failure to comply with these requirements may result in the bidder and subcontractors being disqualified from participating in future bid opportunities for the Commonwealth.

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

TAX PAYER ID #: 98-0674-1

THIS VENDOR VIOLATION FORM MAY BE SENT TO THE LABOR CABINET FOR VERIFICATION. PLEASE MAKE SURE ALL YOUR VIOLATIONS ISSUED WITHIN THE LAST FIVE (5) YEARS ARE LISTED. IF YOU LIST "NONE" BUT THE LABOR CABINET'S RECORDS SHOW OTHERWISE, YOUR BID MAY BE REJECTED. FOR A LIST OF YOUR VENDOR VIOLATIONS, YOU CAN FAX OR EMAIL THE LABOR CABINET WITH YOUR REQUEST.

FAX NUMBER IS (502) 696-1984 OR EMAIL: [wages@ky.gov](mailto:wages@ky.gov).

[illegible]

## BIDDER'S QUALIFICATIONS

The Bidder's Qualifications are required by the owner to be submitted as set forth herewith:

1. This firm is a Corp.\_\_\_\_\_, Partnership\_\_\_\_\_, or Proprietorship\_\_\_\_\_.
2. A permanent place of business is maintained at:

STREET	CITY	STATE	ZIP CODE
--------	------	-------	----------

\_\_\_\_\_  
TELEPHONE NUMBER

3. The following construction plant and equipment will be made available for use on this contract:

---



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4. In the event the contract is awarded the undersigned, surety bonds will be furnished by:

---

5. Experience of Contractor on other similar work:

---



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---



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6. We now have the following jobs under contract and bonded:

JOB	TOTAL CONTRACT	PERCENT COMPLETED
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %
_____	\$ _____	_____ %

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**DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION**

- 1.01 **CERTIFICATION OF DBE:** Any DBE utilized pursuant to this Section shall be certified as a DBE by one of the following: Kentucky Finance and Administration Cabinet, Kentucky Transportation Cabinet or other state Transportation agencies, the Louisville/Jefferson County Metropolitan Sewer District, the Tri-State Minority Supplier Development Council or other state Minority Supplier Development Councils, the Ohio River Valley Women's Business Council, the Women's Business Enterprise National Council, the National Women Business Owners Council, or the Small Business Administration.
- 1.02 **OBLIGATION OF BIDDER/CONTRACTOR:** Bidder/Contractor shall make a good faith effort to meet the DBE contract goal set by the Commonwealth by including DBE's as subcontractors and/or material suppliers on 10% of the total estimated cost of the Contract. The failure to meet the foregoing goal shall not result in disqualification from bidding or being awarded a contract. However, Bidders/Contractors not meeting the DBE goal shall be expected to provide written proof of their good faith efforts. Award of the contract shall be conditioned upon satisfaction of the requirements established by this section. The Bidder/Contractor shall attempt to divide the work in the contract to facilitate use of DBE's (however, there is no requirement that the work be artificially divided or divided in a way that raises the bid price of the Bidder/Contractor).
- 1.03 **PROOF REQUIRED:** Each bidder shall furnish written proof in their bid package that they reached the DBE participation goal for this Contract, or of their good faith efforts to meet the DBE participation goal. A copy of each participating DBE's certification shall accompany the required forms. All submissions shall be subject to verification of the Commonwealth.
- A. Proof that the apparent successful bidder reached the DBE goal shall consist of the following and shall be made on form DB-2-A, attached hereto:
1. The names and addresses of DBE firms that will participate in the contract;
  2. A description of the work each named DBE firm will perform;
  3. The dollar amount of participation by each named DBE firm;
  4. The percentage amount of participation by each named DBE firm;
- B. Proof that the apparent successful bidder made a good faith efforts to meet the DBE participation goal may include the following:
1. Advertisement by the Bidder/Contractor of DBE contracting opportunities associated with this contract in at least one of each of the following periodicals: a periodical in general circulation throughout the Commonwealth, a trade periodical focused on DBE contractors/suppliers in general circulation throughout the Commonwealth, and a minority-focused periodical in general circulation throughout the Commonwealth. The Bidder/Contractor shall include copies of the dated advertisements in his bid package;
  2. Written notice of DBE opportunities in this contract to at least five pertinent DBE's at least seven days prior to the bid opening date. Copies of the written notices shall be included in the bid package;
  3. The Bidder/Contractor's response(s) to those DBE's who requested plans, specifications and/or contracting requirements. Copies of said responses shall be included in the bid package;
  4. Documentation on form DB-2-B of good faith negotiations with at least three DBE's, with no rejection of a qualified DBE without sound reason, including price quotes that are above other subcontractor's price quotes;
  5. Utilization of the Finance and Administration Cabinet's Office of Equal Employment Opportunity and Contract Compliance for referrals to organizations that assist in locating DBE's. Proof of use of such referrals and contacts made as a result thereof shall be included in the bid package.

Submit with Bid.  
(Please copy additional Disadvantaged Business Availability Forms as necessary.)

DB-2-B

# DISADVANTAGED BUSINESS UNAVAILABILITY VERIFICATION

I, \_\_\_\_\_, \_\_\_\_\_ (TITLE)

of \_\_\_\_\_ (PRIME BIDDER)

certify that on \_\_\_\_\_ I contacted the following Disadvantaged owned business by: (circle one) Certified Mail, Phone, In Person to obtain a bid for work items to be performed on the Contract.

DISADVANTAGED CLASSIFICATION (IE. WBE, MBE, DBE, SDVOSB)	CONTRACTOR	WORK ITEMS SOUGHT	FORM OF BID SUPPORT (IE., UNIT PRICE, MATERIALS LABOR & LABOR ONLY)

To the best of my knowledge and belief, said Disadvantaged owned business was unavailable (exclusive of unavailability due to lack of agreement on price) for work on this project, or unable to prepare a bid, for the following reason(s):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

\_\_\_\_\_ was offered an  
(NAME OF DISADVANTAGED BUSINESS)

opportunity to bid on the above-identified work on \_\_\_\_\_ by

(SOURCE)

The above statement is a true and accurate account of why I did not submit a bid on this project.

(SIGNATURE OF DISADVANTAGED BUSINESS)

(TITLE)

(DATE)

Submit with Bid if Applicable.

(Please copy additional Disadvantaged Business Unavailability Forms as needed.)



**OFFICIAL BID DOCUMENT  
FOR  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
FFA LEADERSHIP TRAINING CENTER  
HARDINSBURG, KENTUCKY**

**LIST OF PROPOSED SUBCONTRACTORS:**

**(Must be submitted with Bid)**

The following list of proposed subcontractors is required by the owner to be executed, completed, and submitted with the Bidder's Proposal. All subcontractors are subject to approval by the Division of Engineering and Contract Administration, Department of Facilities and Support Services, Frankfort, Kentucky. Failure to submit this list, completely filled out, may result in bid rejection.

If certain branches of work are to be done by the Prime Contractor, so state. Review/evaluation of subcontractors will occur on the bid opening day. If the Commonwealth requests replacement of a subcontractor, on bid opening day, then the apparent low bidder will provide a replacement subcontractor prior to close of the Commonwealth's business day on that day. Failure of the apparent low bidder to comply with the preceding sentence may result in bid rejection. If subcontractor review/evaluation is not completed on the bid opening day, then procedures for any replacement will be issued based on the uniqueness of each situation. The responsibility for selection, offering of qualified, competent subcontractors to accomplish the work intended is solely the responsibility of the bidder to the Commonwealth.

**ALL BLANKS MUST BE FILLED IN. IF PERFORMED BY THE BIDDER, STATE PRIME/GENRAL CONTRACTOR.**

	BRANCH OF WORK	NAME OF SUBCONTRACTOR
1.	Rough & Finish Carpentry	
2.	Doors, Frames & Hardware	
3.	Painting	
4.	Pole Building	
5.	Plumbing	
6.	Electric	

**OFFICIAL BID DOCUMENT  
FOR  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
FFA LEADERSHIP TRAINING CENTER  
HARDINSBURG, KENTUCKY**

**LIST OF MATERIALS AND EQUIPMENT (MUST BE COMPLETELY FILLED OUT WHEN BID IS SUBMITTED):**

Every item listed under the different phases of construction must be clearly identified so that the Owner will definitely know what the bidder proposes to furnish. Bidders be hereby advised that this list is required by the owner to be executed, completed, and submitted with the Bidder's Proposal.

The use of the manufacturer's dealer's name only, or stating "as per plans and specifications", will not be considered as sufficient identification.

Where more than one "Make or Brand" is listed for any one item, the Owner has the right to select the one to be used.

Failure to submit a proper list may result in rejection of Bidder's Proposal.

	<b>MATERIAL AND/OR EQUIPMENT:</b>	<b>MANUFACTURER AND BRAND NAME:</b>
1.	Packaged Terminal Air Conditioners (PTAC)	
2.	Ductless Spilt Systems	
3.	Plumbing Fixtures	
4.	Water Heater	
5.	Electric Panels	
6.	Light Fixtures	
7.	Wiring Devices	



**Andy Beshear**  
Governor

Commonwealth of Kentucky  
Finance and Administration Cabinet  
DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES  
**DIVISION OF ENGINEERING & CONTRACT  
ADMINISTRATION**

Bush Building, 403 Wapping Street, 2<sup>nd</sup> Floor  
Frankfort, KY 40601  
(502) 564-3155  
Fax (502) 564-3649

**Holly M. Johnson**  
Secretary

**Sam Ruth**  
Commissioner

**Jennifer Linton**  
Executive Director

**NOTICE TO CONTRACTORS  
FOR  
FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION  
FFA LEADERSHIP TRAINING CENTER  
HARDINSBURG, KENTUCKY**

Attached hereto is a copy of the "Advertisement for Bids" for furnishing all labor, equipment, appliances and materials necessary for FFA Cabins, Shop and Miscellaneous Construction, FFA Leadership Training Center, Hardinsburg, Kentucky.

**SAME IS DESIGNATED AS:**

<b>REQUEST NO.</b>	Request for Bid No. RFB-232-20
<b>BID ON:</b>	FFA CABINS, SHOP AND MISCELLANEOUS CONSTRUCTION FFA LEADERSHIP TRAINING CENTER HARDINSBURG, KENTUCKY
<b>BID DATE:</b>	June 23, 2020 2:00 P.M., Eastern Time

Responsible Contractors who have proper experience, equipment and qualifications are invited to bid on this work. These factors will be considered in the Award of Contract and all work will be performed under the standard regulations for construction of the Commonwealth of Kentucky.

**PRE-BID MEETING/SITE VISITS:**

There will not be a pre-bid on the above referenced project. Interested contractors must contact Josh Mitcham, Director of the KY FFA Leadership Training Center. Email: [Josh.Mitcham@education.ky.gov](mailto:Josh.Mitcham@education.ky.gov), Phone: 270-756-2301. Contractors must make an appointment to visit the site. Only one person per appointment permitted. Be prepared for temperature checks at various state agency entry points. If you have a fever, you will be turned away. Face masks are also required by employees/contractors when working, traveling or meeting in groups or in common areas (breakrooms, hallways, etc.)

**PART I  
ADVERTISEMENT FOR BIDS**

**1. INVITATION:**

Sealed bid documents for the following work will be received by the Division of Engineering and Contract Administration, 2nd Floor Bush Building, 403 Wapping Street, Commonwealth of Kentucky, Frankfort, KY 40601, in the manner and on the date hereinafter specified for the furnishing of all labor, materials, supplies, tools, appliances, equipment, services, etc., necessary for FFA Cabins, Shop and Miscellaneous Construction, FFA Leadership Training Center, Hardinsburg, Kentucky, as set forth in the specifications and as shown on the drawings prepared by Steve White, White Pollard Architects, PLLC, Jeffrey McBride, Rampart Engineering, Chris Smith, Advanced Engineers and Land Surveys and approved by the Department for Facilities and Support Services of the Commonwealth of Kentucky and under the terms and conditions to this Request for Bid.

**2. PROJECT DESCRIPTION:**

The project is to construct a new maintenance shop building and two new cabins at the FFA Leadership Training Camp in Hardinsburg, KY. The new shop building will be wood construction over concrete slab with a metal skin containing mostly unconditioned storage space used to house equipment and lawn-mowers for camp maintenance (approx. 2,639 SF) and containing a small, conditioned office area with a single toilet room. The area above the office will be for a storage mezzanine accessed by stairs in the storage area. The storage area will be serviced by two, manually-operated, 14'-0" wide, overhead, insulated, sectional garage doors. Lighting in the storage area will be high-bay LED lights and LED panel type lights in the office area. The building will have three-phase power to allow for welding activities. Two porches will be included - a covered front porch for personnel access and a secured, rear porch for outside storage. The office will be conditioned by a PTAC unit. The concrete floors will be epoxy-shielded, alls in the office will be gypsum board with rubber base. Doors to be hollow metal panels and frames for exterior use. The two cabins are to be 24'-0" x 36'-0" single-room building to house 10 bunk beds for campers located on the site of the demolished bath-house. The buildings will be wood framed on concrete slab with metal exterior skin and asphalt-shingled roofs. The floors will be epoxy-shielded, walls and ceilings will be finished with painted plywood panels. Lighting will be LED panel type lights, HVAC will be ductless split system with two ceiling cassettes in the cabin. Each bunk bed location will be provided with high and low outlets serving both beds. Cabins will have a single exterior door and 4 awning type windows.

**3. METHOD OF BIDDING:**

Bids will be received from Prime Contractors on a Lump Sum Bid Basis for the total project. All phases of work shall be bid to and through the Prime Contracting Firms. Bids shall be submitted in the manner herein described and on the official bid document form included with the conditions and specifications and shall be subject to all the conditions as set forth and described in the Bid Documents.

**SPECIAL NOTE:**

**Bids shall be submitted on the Official Form supplied by the Division of Engineering and Contract Administration. Failure to comply with the foregoing requirements will be cause for invalidation of bid.**

**4. METHOD OF AWARD:**

Award shall be issued on the lowest responsive bid by a responsible bidder. The Bid Document shall contain all qualifying requirements and forms. It is the intent of the Commonwealth of Kentucky to use all available funds.

Bid is subject to **Reciprocal preference for Kentucky resident bidders and Preferences for a Qualified Bidder or the Department of Corrections, Division of Prison Industries (KAR 200 5:410).**

**KRS 45A.490 Definitions for KRS 45A.490 to 45A.494.**

As used in KRS 45A.490 to 45A.494:

- (1) "Contract" means any agreement of a public agency, including grants and orders, for the purchase or disposal of supplies, services, construction, or any other item; and
- (2) "Public agency" has the same meaning as in KRS 61.805.

**KRS 45A.492 Legislative declarations.**

The General Assembly declares:

- (1) A public purpose of the Commonwealth is served by providing preference to Kentucky residents in contracts by public agencies; and
- (2) Providing preference to Kentucky residents equalizes the competition with other states that provide preference to their residents.

**KRS 45A.494 Reciprocal preference to be given by public agencies to resident bidders -- List of states -- Administrative regulations.**

- (1) Prior to a contract being awarded to the lowest responsible and responsive bidder on a contract by a public agency, a resident bidder of the Commonwealth shall be given a preference against a nonresident bidder registered in any state that gives or requires a preference to bidders from that state. The preference shall be equal to the preference given or required by the state of the nonresident bidder.
- (2) A resident bidder is an individual, partnership, association, corporation, or other business entity that, on the date the contract is first advertised or announced as available for bidding:
  - (a) Is authorized to transact business in the Commonwealth; and
  - (b) Has for one (1) year prior to and through the date of the advertisement, filed Kentucky corporate income taxes, made payments to the Kentucky unemployment insurance fund established in KRS 341.490, and maintained a Kentucky workers' compensation policy in effect.
- (3) A nonresident bidder is an individual, partnership, association, corporation, or other business entity that does not meet the requirements of subsection (2) of this section.
- (4) If a procurement determination results in a tie between a resident bidder and a nonresident bidder, preference shall be given to the resident bidder.
- (5) This section shall apply to all contracts funded or controlled in whole or in part by a public agency.
- (6) The Finance and Administration Cabinet shall maintain a list of states that give to or require a preference for their own resident bidders, including details of the preference given to such bidders, to be used by public agencies in determining resident bidder preferences. The cabinet shall also promulgate administrative regulations in accordance with KRS Chapter 13A establishing the procedure by which the preferences required by this section shall be given.
- (7) The preference for resident bidders shall not be given if the preference conflicts with federal law.
- (8) Any public agency soliciting or advertising for bids for contracts shall make KRS 45A.490 to 45A.494 part of the solicitation or advertisement for bids.

The reciprocal preference as described in KRS 45A.490-494 above shall be applied in accordance with 200 KAR 5:400.

**Determining the residency of a bidder for purposes of applying a reciprocal preference**

Any individual, partnership, association, corporation, or other business entity claiming resident bidder status shall submit along with its response the attached Required Affidavit for Bidders, Offerors, and Contractors Claiming Resident Bidder Status. The BIDDING AGENCY reserves the right to request documentation supporting a bidder's claim of resident bidder status. Failure to provide such documentation upon request shall result in disqualification of the bidder or contract termination.

A nonresident bidder shall submit, along with its response, its certificate of authority to transact business in the Commonwealth as filed with the Commonwealth of Kentucky, Secretary of State. The location of the principal office identified therein shall be deemed the state of residency for that bidder. If the bidder is not required by law to obtain said certificate, the state of residency for that bidder shall be deemed to be that which is identified in its mailing address as provided in its bid.

5. **PROJECT CONTACTS:**

1. Architect: Steve White, White Pollard Architects, PLLC, (859) 469-9177, [steve@whitepollard.com](mailto:steve@whitepollard.com)
2. Consultant: Jeffrey McBride, Rampart Engineering, (502) 541-5352, [jeffrey@rampartengineering.com](mailto:jeffrey@rampartengineering.com)
3. Project Manager: Carl Kratzer, Division of Engineering and Contract Administration, (502) 782-0374, [Carl.Kratzer@ky.gov](mailto:Carl.Kratzer@ky.gov)
4. Consultant: Chris Smith, Advanced Engineering and Land Surveys, (502) 244-3876, [aels@bellsouth.net](mailto:aels@bellsouth.net)
5. Agency: Josh Mitcham, KY Department of Education, (502) 227-8298, [josh.mitcham@education.ky.gov](mailto:josh.mitcham@education.ky.gov)
6. Purchasing Agent: Margaret MacDonald, Division of Engineering and Contract Administration, (502) 564-5182, [Margaret.MacDonald@ky.gov](mailto:Margaret.MacDonald@ky.gov)

6. **BID SUBMITTAL:**

Due to the COVID-19 virus, the Bush Building is closed until further notice. Bids will no longer be accepted via postal carrier (USPS, UPS, FED EX, etc.) nor can bids be delivered to the Bush Building. All forms in your bid document shall be completely filled out when your bid is submitted. **Bids must be submitted electronically through MOVEit in order to be accepted.** Instructions are attached. **Contractors must load their Bid Documents under the corresponding RFB in MOVEit in order for it to be received. IF BID IS NOT UPLOADED IN THE CORRECT FOLDER IN MOVEit, THE BID WILL BE DEEMED NON-RESPONSIVE.** *Bidders are encouraged to take a screen shot verifying bid submittal.* This is a secure website, no one can see these bids but the buyers. They are date and time stamped when submitted.

Please note that the instructions for MOVEit state that contractors will be notified when their bid is received. Buyers will NOT be notifying contractors.

All results will be posted to Lynn Imaging planroom after the bid opening and review. If additional information is needed from the successful bidder the buyer will be in contact.

**NOTE: Your bid must be sent in time to arrive prior to the bid closing date and time.**

Bidder assumes full responsibility for timely delivery of the bid in compliance with the above described procedures and conditions.

**There will be a public bid reading by conference call on the bid opening date at 2:30 P.M. Eastern Time.**

**The dial in number is 502-782-2663 or 844-603-5060.**

**Participant code is 45182#**

7. **BID WITHDRAWAL:**

No bidder may withdraw his bid for a period of thirty (30) days after the date set for the opening of bids.

8. **BONDING:**

All bids shall be accompanied by a bid guarantee (in the form of a bid bond or certified check) of not less than five (5%) percent of the amount of the lump sum base bid. A 100% Performance Bond and a separate 100% Payment Bond shall be furnished by the successful bidder. All bonding and insurance requirements are contained in the Instructions to Bidders and/or General Conditions. Bonds should be executed by a surety company authorized to do business in the Commonwealth of Kentucky.

9. **RIGHT TO REJECT:**

The Division of Engineering and Contract Administration, Commonwealth of Kentucky, reserves the right to reject any and all bids and to waive all informalities and/or technicalities where the best interest of the Commonwealth may be served.

10. **GENERAL INFORMATION:**

- A. Bidder's Qualifications, Unit Prices, Proposed Subcontractors, and List of Materials are required to be submitted with the bid.
- B. All documents related to this project shall be submitted, transmitted, transferred, reviewed, approved or rejected, and/or otherwise processed using the Owner's Document Collaboration System (eCommunications) which is the Owner's web-based document collaboration system that shall be used by all project participants. No submission, transmittal, transfer, review, approval or processing shall be deemed Official without the use of this system.
- C. KRS 337.550 (1) Provides that if any contractor or subcontractor is found to be in violation of any provisions of KRS 337.505 to 337.550 by the Department of Labor and upon notification to the Commissioner of the Department for Facilities and Support Services, the Commissioner of the

Department for Facilities and Support Services shall hold such contractor or subcontractor ineligible to bid on public works until such a time as that contractor or subcontractor is in substantial compliance as determined by the Commissioner of Labor.

- D. Each demolition/renovation project must comply with Kentucky Division of Air Pollution Control Regulation 401 KAR 57:011. This includes notification, in writing, to the Division of Air Pollution Control, ten (10) days before start of the project.

- E. **Tobacco-Free:** Pursuant to Executive Order, use of any tobacco products (including e-cigarettes) is prohibited in all Executive Branch buildings and parking lots and on the grounds. Please refer to Executive Order # 2014-747 for complete details.  
For FAQ's go to: <http://tobacco-free.ky.gov/Pages/FAQs.aspx>

- F. **REGISTRATION WITH SECRETARY OF STATE:**

Domestic and foreign corporations shall be registered with the Kentucky Secretary of State and declared to be in "good standing" prior to award of contract. Offeror should verify status at the following website: <http://www.sos.ky.gov> and click on "Business Services". Failure to comply with this requirement within (5) days after notification may render your bid non-responsive.

- G. **REGISTRATION WITH SECRETARY OF STATE BY A FOREIGN ENTITY:**

Pursuant to KRS 45A.480(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by [KRS 14A.9-010](#) to obtain a certificate of authority to transact business in the Commonwealth ("certificate") from the Secretary of State under [KRS 14A.9-030](#) unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. Therefore, foreign entities should submit a copy of their certificate with their solicitation response. If the foreign entity is not required to obtain a certificate as provided in [KRS 14A.9-010](#), the foreign entity should identify the applicable exception in its solicitation response. Foreign entity is defined within [KRS 14A.1-070](#).

**For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity's solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.**

Businesses can register with the Secretary of State at <https://secure.kentucky.gov/sos/ftbr/welcome.aspx>.

- H. **REGISTRATION with eMars (eProcurement):**

In order to receive a contract in the State's electronic procurement system (eMars/eProcurement), a vendor/contractor shall be registered to conduct business therein. Business entities not already registered may register by visiting the eProcurement website at (<http://emars311.ky.gov/webapp/vssprdonline/AltSelfService>) and complete the registration information. The website has phone numbers and email addresses to facilitate answering any questions you may have with the registration or update process. Failure to comply with this requirement within (5) days after notification may render your bid non-responsive.

- I. **PRE-BID MEETING:**

There will not be a pre-bid on the above referenced project. Interested contractors must contact Josh Mitcham, Director of the KY FFA Leadership Training Center.

Email: [Josh.Mitcham@education.ky.gov](mailto:Josh.Mitcham@education.ky.gov), Phone: 270-756-2301. Contractors must make an appointment to visit the site. Only one person per appointment permitted. Be prepared for temperature checks at various state agency entry points. If you have a fever, you will be turned away. Face masks are also required by employees/contractors when working, traveling or meeting in groups or in common areas (breakrooms, hallways, etc.)



## MOVEit TRANSFER

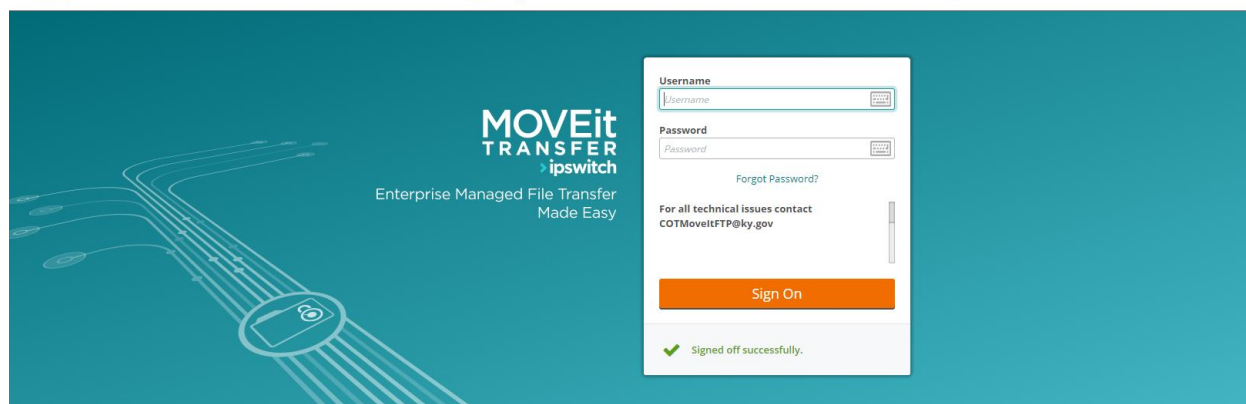
<https://ftp.ky.gov>

This application is used for

**Secure File Transfer:** upload/download files with the FTP application and share the secure location with other registered MOVEit users with no size limit. NOTE: the retention of files on all MOVEit applications is 90 days unless otherwise requested.



- Encrypted File Transfer and Messaging  
 - HTTPS, FTPS and SFTP (SSH), Optional Client Certs/Keys  
 - ISO 27001, HIPAA, PCI, GDPR, SOX, BASEL III/IV, FIS, FISMA, GLBA, FFIEC, ITAR Compliant  
 Ky.gov An Official Website of the Commonwealth of Kentucky



Login.

Username: kyrfb  
 Password: Submitter2020

**Forgot Password** - you cannot change the password on this account.

Unable to login –

Contact the [CommonwealthServiceDesk@ky.gov](mailto:CommonwealthServiceDesk@ky.gov) and they will notify the MOVEit team to assist you. You can also call 502-564-7576.

### IMPORTANT:

Please include company name and RFB# in the file name. It is recommended that all files (bid documents, equipment lists, bid bond, etc.) be combined into one document before submission.



After you login to the system, you will see this screen.

- Encrypted File Transfer and Messaging
- HTTPS, FTPS and SFTP (SSH), Optional Client Certs/Keys
- ISO 27001, HIPAA, PCI, GDPR, SOX, BASEL I/II/III, FIPS, FIS

Ky.gov An Official Website

Signed onto Commonwealth of Kentucky as Kentucky RFB Submitter engineering (kyrfb).
MY ACCO

HOME

All time and date stamps displayed on this site are GMT -4, except time and date stamps recorded during standard time (GMT -5).

Powered by  
**MOVEit** > ipswitch

**Files are retained for 90 days.**  
**No size restrictions are placed on attachments.**

**For service and support click the TECH SUPPORT link in the upper right hand corner.**

This site is for submitting RFB/RFPs.

INSTRUCTIONS:  
To submit your proposal, locate the folder below that corresponds to the Proposal identification number listed in the vendor self-service portal.

- Open the folder, browse to your files and select the files to upload, make sure to click Upload.
- When the upload is complete a green check mark will appear to the left of your files and the bottom of the window will have the close button.
- Click Close and
- Sign out of the application.

Your files will automatically be transferred to our procurement staff and verification of receipts will be sent to you via email.

Thank you for your submission. - FINRFPsubmitter

Upload

Home Folder

Notice the instructions on the screen for submission.

Scroll down the page to see the list of RFB/RFP's available for submission. Click the folder that corresponds to the project you are bidding on to open the folder. Upload your proposal to the correct RFB/RFP

/Distribution/KyAgencies/KYFinance/Procurement/ENG-RFP

<input type="checkbox"/>	Name	<input checked="" type="checkbox"/>	Size/Contents	Creator	Created
<input type="checkbox"/>	RFB-168-20				3/18/2020 3:39:56 PM
<input type="checkbox"/>	RFB-174-20				3/18/2020 3:40:49 PM
<input type="checkbox"/>	RFB-176-20				3/18/2020 3:40:43 PM
<input type="checkbox"/>	RFB-177-20				3/18/2020 3:40:37 PM
<input type="checkbox"/>	RFB-178-20				3/18/2020 3:40:33 PM
<input type="checkbox"/>	RFB-181-20				3/18/2020 3:40:24 PM
<input type="checkbox"/>	RFB-183-20				3/18/2020 3:40:17 PM
<input type="checkbox"/>	RFB-189-20				3/18/2020 3:40:04 PM
<input type="checkbox"/>	RFB-191-20				3/18/2020 3:40:12 PM

**\*\* Highly Recommended \*\***

Before uploading your files, add your Company name to the front of all file names.

Example: AcmeCoyote\_Filename.pdf

**NOTES Section** – Use this section to input your contact information or make comments about the files being uploaded.

Click on Drag and Drop Files or the **Upload Button**.



**Drag and drop file to add files!**

Or click the "Upload Files" button

Click Browse or Drag and Drop.

Navigate to the folder location of the file(s), then select the file(s) that you want to send. You can also drag and drop files into this field. There is not a size limit for file uploads.

Once all files have been added, the file(s) will show on the screen.

Click Upload.

A check mark will appear to the **left** of each successful upload.

\*\*\* We highly recommend that you print the screen as verification for your records that the file(s) were submitted. There is no other verification of receipt of files. If you feel that you need further verification, you can email [COTMOVEitFTP@ky.gov](mailto:COTMOVEitFTP@ky.gov).

Verify that the file was uploaded to the correct folder by reviewing the file path (see highlighted below).

#### Folders

/Distribution/KyAgencies/KYFinance/Procurement/ENG-RFP/RFB-223-20 Bluegrass Station 352 Fence/

Drop files to upload.				Upload Files
<input type="checkbox"/> Name	<input checked="" type="checkbox"/> Size/Contents	Creator	Created	
<input type="checkbox"/> MOVEit Instructions for Vendor.pdf	<input checked="" type="checkbox"/> 693.3 KB	Kentucky RFB Submitter engineering	5/22/2020 8:18:10 AM	

Click Close at the bottom of the window.  
Sign out.



The **Sign Out** Link will exit you from the application.

The **Tech Support Link** will provide links to the User Guide under MOVEit Transfer Help, and Information on how to Contact the COT MOVEit Team.

#### FOR TECHNICAL ASSISTANCE WITH MOVEit/FTP

- Non-Commonwealth third parties should contact the Commonwealth Service Desk.  
Commonwealthservicedesk@ky.gov and cc: COTMOVEITFTP@ky.gov. Or call 502-564-7576.
  - In the request for assistance please include the following -- username, telephone number, RFP number, list of any files you are uploading, and a detailed description of any errors or messages received.

## Section 1: Definitions

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1. "Addendum" means a written or graphic instrument issued by the purchasing agency prior to the execution of the contract that modifies or interprets the Bidding Documents by addition, deletion, clarification or correction.
  2. "Alternate" means an optional item stated in the bid the amount of which is to be added to or deducted from the amount of the base bid.
  3. "Architect" or "Engineer" means a firm that provides professional design services and is engaged by the Division of Engineering and Contract Administration for Capital Construction Projects, and identified as such in the Contract Documents. The term refers to the design team, consisting of the prime architect/engineer and all Sub-Consultants (if used) or consultant identified by the owner.
  4. "Bid" means the sum stated in the Bid Response for which the bidder offers to perform the work described in the specifications and detailed on the plans.
  5. "Bidder" means one who submits a bid directly to the owner for the work described in the bidding documents.
  6. "Bidding Documents" means the Solicitation, including Instructions to Bidders, General Conditions, Special and Supplemental Conditions, Forms for Response, plans, specifications and Addenda issued prior to receipt of bids.
  7. "Bid Response" means a complete and properly signed document, offering to do the work or designated portion thereof, supported by data called for by the bidding documents.
  8. "Chief Purchasing Officer" means the secretary of the Finance and Administration Cabinet, who shall be responsible for all procurement of the Commonwealth except as provided by KRS Chapters 175, 176, 177, and 180. KRS 45A.030(3).
  9. "Commonwealth" means the Commonwealth of Kentucky.
  10. "Construction" means the process of building, altering, repairing, improving or demolishing any public structures or buildings, or other public improvements of any kind to any public real property. It does not include the routine maintenance of existing structures, buildings or real property. KRS 45A.030(4).
  11. "Contract (CT/CT2)" means a document established to purchase a specific quantity or amount of goods or non-professional services at a specific price. KRS 45A.030(8).
  12. "Contract Modification" means any written alteration in the specifications, delivery point, rate of delivery, contract period, price, quantity or other contract provisions of any existing contract, whether accomplished by unilateral action in accordance with a contract provision or by mutual action of the parties to the contract. It includes bilateral actions, such as supplemental agreements, and unilateral actions, such as change orders, administrative changes, notices of termination and notices of the exercise of a contract option. KRS 45A.030(9).
  13. "DECA" means the Division of Engineering and Contract Administration within the Department for Facilities and Support Services, Finance and Administration Cabinet.
  14. "Delivery Order (DO/DO2)" means a document established by a state agency to purchase a specific quantity at a specific price referencing a Master Agreement. DO documents are generally used for commodities and DO2 documents are used for services.
  15. "DFSS" means the Department for Facilities and Support Services within the Finance and Administration Cabinet.
  16. "DRP" means the Division of Real Properties within the Department for Facilities and Support Services, Finance and Administration Cabinet.
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17. "Electronic Offer" means an online bid through the state's eProcurement system, an offer submitted by electronic mail, or an offer submitted by facsimile.
18. "FAC" means the Finance and Administration Cabinet.
19. "Government Body" means any department, commission, council, board, bureau, committee, institution, legislative body, agency, government, corporation or other establishment of the executive or legislative branch of the state government. KRS 45A.030(17).
20. "Master Agreement (MA)" means a document that establishes a price agreement for use by state agencies with a vendor for supplying specific goods and services at specific unit prices during a specified time period. It does not place an order for goods and services.
21. "Offer" means a bid, proposal, Solicitation response or quotation.
22. "OPS" means the Office of Procurement Services within the Finance and Administration Cabinet.
23. "Owner" means the Commonwealth of Kentucky.
24. "Person" means any business, individual, organization or group of individuals. KRS 45A.030(20).
25. "Planholder" means any entity, supplier and/or subcontractor that has purchased plans and specifications from the Division of Engineering and Contract Administration's reprographics vendor in order to submit a bid with the Commonwealth of Kentucky.
26. "Procurement" means the purchasing, buying, renting, leasing or otherwise obtaining of any supplies, services or construction. It includes all functions that pertain to the procurement of any supply, service or construction item, including description of requirements, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration. KRS 45A.030(21).
27. "Proof of Necessity Agreement (PON2)" means a type of contract established by a state agency to purchase professional services (i.e. personal service contracts, grants and memoranda of agreements).
28. "Purchase Order (PO/PO2)" means a type of contract established by a state agency to purchase a specific quantity or amount of goods or non-professional services at a specific price and is generally for a one-time purchase. A PO2 for non-professional services may contain an option to renew for an additional time period.
29. "Purchasing Agency" means any governmental body that is authorized by this code or its implementing administrative regulations or by way of delegation from the chief purchasing officer to contract on its own behalf rather than through the central contracting authority of the chief purchasing officer. KRS 45A.030(23).
30. "Purchasing Officer" means any person authorized by a governmental body in accordance with procedures prescribed by administrative regulations to enter into and administer contracts and make written determinations and findings with respect thereto. The term includes an authorized representative acting within the limits of authority. KRS 45A.030(24).
31. "Quote" or "Quotation Response" means a complete offer to perform the work specified in the Request for Quotation.
32. "RFB" means a Request for Bids.
33. "RFI" means a Request for Information.
34. "RFP" means a Request for Proposals. KRS 45A.070(5).
35. "RFQ" means a Request for Quotations.

- 36. "SAS" means the Office of Statewide Accounting Services within the Finance and Administration Cabinet.
- 37. "Secretary" means the secretary of the Finance and Administration Cabinet.
- 38. "Solicitation" means an RFB, RFI, RFP or RFQ.
- 39. "Sub-bidder" or "Subcontractor" means one who submits a bid to a prime bidder for materials or labor for a portion of the work described in the bidding documents.
- 40. "Tiered Pricing" means a determination of price based on volume, where the larger the volume, the larger the discount offered.
- 41. "Time" means calendar days.
- 42. "Unit Price" means an amount stated in the bid as a price per unit of measurement for materials or services as described in the bidding documents.
- 43. "Using Agency" means the state government entity that utilizes the work being contracted.

**FAP 220-05-00****BIDDER INSTRUCTIONS FOR COMPETITIVELY SEALED BID CONSTRUCTION SOLICITATIONS**

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- 1. Bidder's Representations:** Each bidder, by submitting a bid, swears or affirms, under penalty of law, that:
  - a. The bidder has read and understands the bidding documents and the bid is made in accordance with the bidding documents.
  - b. The bidder has carefully examined the site of the proposed work and is familiar with the local conditions under which the work is to be performed.
  - c. The bid is premised upon furnishing the work required by the bidding documents.
  - d. The bid amount has been arrived at by the bidder independently and has been submitted without collusion with, and without any agreement, understanding or planned common course of action with any other contractor, vendor of materials, supplies, equipment or services described in the Solicitation, that is designed to limit independent bidding or competition.
  - e. The contents of the bid have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder, or its surety on any bond furnished with the bid and will not be communicated to any such person prior to the bid opening.
  - f. The bidder is legally entitled to enter into a contract with the Commonwealth and the award of a contract shall not create any conflict of interest, including those set out in KRS 45A.330 – KRS 45A.340; KRS 45A.455 and KRS 164.390.
- 2. Bidding Documents:**
  - a. A bidder, sub-bidder, sub-contractor and others may obtain bidding documents in the manner and for the charge, if any, stated in the Solicitation.
  - b. A complete set of bidding documents shall be used in preparing bids. The Commonwealth assumes no responsibility for misinterpretations resulting from the use of incomplete sets of bidding documents. The bidder shall supply all information called for in the Solicitation. Failure to supply the specified information may be cause for determining the bid nonresponsive.
  - c. The Commonwealth, in providing bidding documents, does so only for the purpose of obtaining bids on the work and does not confer a license or grant for any other use.
  - d. A bidder shall promptly notify the purchasing officer of any ambiguity, inconsistency or error, which it may discover upon examination of the bidding documents or of the site and local conditions.
  - e. All questions regarding the meaning or interpretation of the bidding documents shall be directed in writing to the purchasing officer. Unless otherwise specified in the Solicitation, questions received less than ten (10) calendar days prior to the date for receipt of bids may not be answered.
  - f. Any interpretation, correction or change of the bidding documents shall be made by an addendum issued by the purchasing agency. Interpretations, corrections or changes of the bidding documents made in any other manner shall not be binding and bidders shall not rely upon such interpretations, corrections or changes.
  - g. Unless otherwise indicated in the bidding documents, the materials, products and equipment described or referenced by manufacturers' or vendors' names, trade names and catalog numbers are intended to establish a standard of required function, dimension, appearance and quality. Unless otherwise stated, equal items may be furnished or used if approved by the purchasing officer in consultation with the architect or the director of DECA.

- h. Addenda shall be published on the Commonwealth's eProcurement web site, and shall be issued to all who are registered planholders with the contracted reprographics company or other distribution authorized by the director of DECA.
- i. Copies of addenda shall be made available for inspection wherever bidding documents are on file.
- j. No addenda of a material nature shall be issued later than seven (7) calendar days prior to the date for receipt of bids, except for addenda postponing the date for receipt of bids or withdrawing the Solicitation.
- k. The bidder shall ascertain prior to submitting a bid that the bidder has received all addenda issued by the purchasing officer for the particular solicitation. The bidder shall acknowledge receipt of all addenda on the Bid Response or by a separate letter to the purchasing officer, which shall be received at or prior to the hour and date specified for receipt of bids.

### **3. Bidding Procedure:**

- a. Bids shall be submitted on the Bid Documents provided by the purchasing officer.
- b. All blanks in the Bid Documents shall be completed and all required support data shall be furnished.
- c. If required in the bidding documents, sums shall be expressed in both words and numerical figures. In the case of discrepancy between the two, the amount in words shall prevail.
- d. The authorized representative of the bidder, who signed the Bid Response, shall initial any alteration or erasure in ink.
- e. The bid shall be firm in offer and conform substantially to the advertised terms, plans and specifications. Any qualifications or reservation imposed by a bidder in the bid retaining the option of accepting, modifying or rejecting an offered contract shall be cause to render the bid not firm and ineligible for consideration of award. Any offer in response to the Solicitation that includes terms contrary or in addition to those in the Solicitation may be considered non-responsive and may be rejected by the Commonwealth.
- f. All alternates specifically called for by the Commonwealth shall be bid. Voluntary alternate bids or an alternate to a lump sum bid shall not be considered.
- g. The bidder shall make no stipulations on the Bid Response nor qualify the bid in any manner.
- h. A person legally authorized to bind the bidder to a contract shall sign the Bid Response. The Bid Response shall also include the legal name of the bidder and a statement indicating whether the bidder is a sole proprietorship, a partnership, a corporation or other legal entity. A bid by a corporation shall also identify the state of incorporation and federal employer identification number.
- i. The purchasing officer shall retain the bid security of bidders until:
  - 1. The contract has been executed and performance and payment bonds have been furnished;
  - 2. The specified time has elapsed so that bids may be withdrawn; or
  - 3. All bids have been rejected.
- j. The completed Bid Response, bid security, and required support data shall be enclosed in a sealed envelope. The envelope shall be addressed to the bid receipt clerk stated in the Solicitation and shall identify the bidder's name and address, the invitation number stated in the bidding documents, closing date and hour. If the bid is sent by mail, the sealed envelope shall contain the notation "BID ENCLOSED" on the face thereof.



- k. Bids shall be received at the designated location prior to the closing time and date for receipt of bids indicated in the Solicitation or any extension thereof made by addendum. Bids received after the closing time and date for receipt of bids may be considered for evaluation and award only if:
  - 1. No other bids were received within the advertisement period;
  - 2. The readvertisement time delay would seriously affect the operations of the using agency; and
  - 3. In the reasonable judgment of the purchasing officer, the bid was finalized prior to the official closing time and date for the receipt of bids.
- l. A bidder shall assume full responsibility for timely delivery at the location designated for receipt of bids.
- m. Oral, telephonic, facsimile or telegraphic bids or changes in bids by such methods are not permitted and shall not be considered.
- n. A competitively solicited contract shall be awarded from a bid evaluation in the state's eProcurement system or all bidders shall be notified of the award in writing.

#### **4. Modification or Withdrawal of a Bid:**

- a. A bid may be withdrawn prior to the closing time and date for receipt of bids by written request from an authorized representative of the bidder. The modification or withdrawal of a bid shall be received by the receipt clerk stated in the Solicitation prior to bid closing time to be considered valid.
- b. A withdrawn bid may be resubmitted up to the closing time designated for the receipt of bids.
- c. No bidder may withdraw, modify or cancel its bid for a period of thirty (30) calendar days following closing time and date for receipt of bids without the bid security being subject to forfeiture.

#### **5. Legal Requirements:**

- a. A foreign corporation submitting a bid shall be registered with the Kentucky Secretary of State and be declared in good standing prior to the issuance or receipt of a contract.
- b. A domestic corporation submitting a bid shall be in good standing in accordance with the requirements of the Kentucky Secretary of State.

#### **6. Taxes:**

- a. The winning bidder shall be liable for payment of Kentucky sales and use tax.
- b. The winning bidder is deemed the end user of all building materials used in construction projects for the Commonwealth.
- c. The winning bidder may not separately state Kentucky sales or use tax payable by the Commonwealth.

#### **7. Planholder's List:** The published planholder and addenda listing is for general information purposes and the exclusion or inclusion of any firm in no way expresses or implies Commonwealth approval or disapproval of the qualifications of any listed bidder, subcontractor, or material or equipment supplier.

#### **8. Bid Bonds:** Pursuant to KRS 45A.185, DECA or the using agency may require a bid bond as surety that a bidder will hold its offer firm for a specified period of time. If the Solicitation requires a bid bond, a bidder shall file with the requesting agency a bid bond or certified check in the amount and form specified by the Solicitation with the requesting agency. The bond shall be received either with the bid or prior to the bid closing to be considered.

- a. The bond shall be in an amount equal to at least five percent (5%) of the amount of the bid or as stated in the Solicitation.
- b. In addition to signing the bid bond as principal, the bidder shall have the bond signed by a surety company authorized to do business in the Commonwealth. A list of surety companies may be obtained from the Kentucky Department of Insurance. If the surety on a bond has its authority to do business in Kentucky revoked or, if for any reason it ceases to do business in the Commonwealth, the bidder shall promptly obtain another surety on the bond.
- c. The bond shall be conditioned on full performance of all obligations imposed on the bidder by the Solicitation, including the obligation to keep the price firm for as long a period as specified in the Solicitation, obligation to enter into a contract with the Commonwealth, and the obligation to file a performance payment bond if required by contract. The bid bond shall provide that upon failure to perform an obligation, the Commonwealth may recover from the bidder and the surety, or either of them, any and all damages suffered because of the failure.
- d. If a bidder elects to submit a certified check in lieu of a bid bond, it shall be security for full performance of all obligations referred to in subsection c. of this Section.
- e. If a bidder is not awarded a contract, the certified check shall be returned to that bidder promptly after the award is made. The successful bidder's check shall be returned after the contract is awarded or as soon as the bidder has filed a performance bond, if required. Checks may be returned by certified mail, return receipt requested. The return receipts shall be electronically attached or hard copies attached to each bidder's bid and filed in the bid folder.

#### **9. Consideration of Bids:**

- a. Unless the bidding documents indicate otherwise, all properly identified, timely bids shall be publicly opened, read aloud, and listed on the official bid tabulation. Tabulations shall be made available to bidders upon written request to the FAC's Open Records Custodian.
- b. The Commonwealth retains the right to cancel the Solicitation, to reject any and all bids, and to waive technicalities and minor irregularities in bids, if such action is determined to be in the best interest of the Commonwealth.
- c. Grounds for the disqualification of bids are stated in 200 KAR 5:306(4)(2).
- d. Minor or technical deficiencies or irregularities in a bid may be waived by the purchasing officer on behalf of the Commonwealth, if:
  - 1. The purchasing officer determines that it is in the Commonwealth's best interest to do so;
  - 2. The technicalities or irregularities are mere matters of form not affecting the material substance of a bid, represent an immaterial deviation from or variation in the precise requirements of the Solicitation, and have no more than a trivial or negligible effect on price, quality, quantity or delivery of supplies or performance of services being procured; and
  - 3. The correction or waiver of the technicality or irregularity does not affect the relative standing of, or prejudice other bidders.
- e. If the Commonwealth does not waive the deficiency, the deficient bid shall be rejected.

#### **10. Acceptance of Bid:**

- a. A contract shall be awarded, after a reasonable bid evaluation period, in accordance with the Solicitation, if the acceptable bid is within the amount budgeted by the agency.

- b. The Commonwealth reserves the right to accept or reject any alternate bid. If alternates designated by the Commonwealth are considered in the award, the alternates shall be accepted in the sequence in which they are listed on the Bid Documents and the lowest bid sum shall be computed on the basis of the sum of the base bid plus any alternates accepted.

#### **11. Qualification of Contractors:**

- a. A bidder shall submit a statement of the bidder's qualifications as part of the Bid Response. The purchasing officer shall have the right to make such inquiry as deemed necessary to determine the ability of the bidder to perform the work in a prompt and efficient manner in accordance with the contract documents. The failure of a bidder to promptly supply information in connection with the purchasing officer's inquiry may be grounds for a determination that such bidder is nonresponsive.
- b. In determining the qualifications and responsibility of a bidder, the purchasing officer shall consider the bidder's experience, facility, previous work standing, financial standing, skill, quality and efficiency of construction plant, and equipment proposed to be utilized on the project.
- c. The Commonwealth may reject any bid if an investigation and evaluation of the bidder's qualifications give reasonable doubt that the bidder can perform the work in a prompt and efficient manner in accordance with the contract documents.

#### **12. Unit Prices:**

- a. If requested in the Solicitation, a bidder shall submit a list of unit prices in accordance with the Bid Document instructions, which shall include labor, materials, equipment, appliances, supplies, overhead and profit, as applicable.
- b. Unit prices shall be used for the pricing of changes in the quantity of work from that indicated by the contract drawings and specifications, if the Commonwealth has authorized such changes in writing.
- c. Only one (1) unit price shall be quoted for each designated item of work. The unit price shall be used to calculate price adjustments based on deductive as well as additive changes.
- d. Unit prices shall apply to all phases of the work whether the work is performed by the bidder or by the bidder's subcontractor.
- e. For unit prices of a lump sum bid contract, the Commonwealth reserves the right, prior to an award of contract, to evaluate the unit prices and adjust or reject any unit price that is determined by the purchasing officer to be unreasonable in amount.
- f. If a total sum bid is made by line item, and unit prices are quoted for estimated quantities of units of work, such unit prices are not subject to change. However, the purchasing officer reserves the right to correct mathematical errors in extensions and additions by the bidder. In the latter case, the purchasing officer's corrected bid sum total shall supersede the bidder's incorrect computed bid sum total.

#### **13. Subcontractor Listing:**

- a. If requested, a bidder shall list the names of subcontractors proposed for each of the principal portions of the work, including those persons or entities who are to furnish material or equipment fabricated to a special design, in the designated place on the Bid Documents.
- b. When a listed subcontractor is proposed for a principal portion of the work as required in subsection a. above, and that subcontractor is not self-performing the work, but is subcontracting the work to lower tier subcontractor, each lower tier subcontractor shall be listed in parenthesis after the name of the main subcontractor. Without such listing of lower tier contractors, the main subcontractor must perform the work of that principal portion of the work with its own forces in its entirety.

- c. A bidder shall establish, to the satisfaction of the purchasing officer, the reliability and responsibility of the listed subcontractors. The bidder may be required by the purchasing officer to provide additional information regarding listed subcontractors, including listed lower tier subcontractors.
- d. If, after due investigation, there is reasonable objection to the qualifications of a listed subcontractor or a listed lower tier subcontractor, the bidder shall, upon written direction of the purchasing officer, submit the name of an acceptable substitute subcontractor or lower tier subcontractor with no change in bid price. The failure of the bidder to promptly comply with this requirement may be grounds for rejection of the bid.
- e. Any listed subcontractor or listed lower tier subcontractor to whom the purchasing officer does not make written objection prior to the award of the contract shall be deemed acceptable to the Commonwealth.
- f. A bidder shall make no other substitution for any listed subcontractor or listed lower tier subcontractor without first receiving the approval of the purchasing officer in writing of the intended substitution and the specific reason for the substitution. A substitution may be disapproved if the purchasing officer has reasonable objection. The purchasing officer may require a written agreement from the subcontractor being released.
- g. Any work performed by a lower tier subcontractor that is not listed on the form of proposal in the manner described above, where required by the purchasing officer, shall be deemed to have been installed at the risk of the general contractor and the Commonwealth reserves the right, at its sole discretion, to reject that portion of the work and require that the work be removed and installed by a listed subcontractor or that the Commonwealth otherwise be compensated by a credit change order for an amount determined by the Commonwealth as reasonable for acceptance of such work installed by a non-listed lower tier subcontractor.
- h. Nothing contained in the bidding documents shall be deemed to create a contractual relationship between the Commonwealth and any subcontractor.

#### **14. Materials and Contractor Listing:**

- a. If requested, a bidder shall submit a listing of primary materials and equipment, including manufacturer's name, brand and catalog number. The materials and equipment listing shall be bound with the Bid Response or completed in the time period designated in Section 15.b. of this FAP.
- b. Prior to the final acceptance of a bid, the purchasing officer shall make a preliminary review of the bidder's list of materials and equipment. The purchasing officer shall advise the bidder of the tentative acceptability of such materials and equipment, subject to satisfactory completion and approval of shop drawings, or direct such other action as may be necessary in order to meet the requirements of the contract documents. If any of the listed material or equipment is determined not to meet the requirements of the contract documents, the bidder shall be required to furnish other material or equipment meeting those requirements at no change in bid price. Preliminary review and acceptance of the above list shall not relieve the bidder, as the contractor, of the obligation to furnishing equipment and materials in accordance with the contract documents.

#### **15. Post-Bid Review:**

- a. A bidder may have an authorized representative at the bid opening for the submittal of the material and equipment listing and the post-bid review of the apparent winning bid.
- b. Unless otherwise provided in the bidding documents or authorized by the purchasing officer, the apparent winning bidder shall submit the material and equipment listing no later than one (1) hour after the close of the reading of the bids. The materials and equipment listing shall be that listing bound with the Bid Documents.
- c. After opening, the scope of work bid by each bidder shall be reviewed by representatives of the purchasing agency, the using agency, the architect or engineer, and the apparent winning bidder. Review shall be directed toward subcontractors, material listing, unit prices and qualifications of the bidder.

- d. The bidder's representative shall have the authority and ability to respond to questions that arise during the review.

#### **16. Equal Employment and Nondiscrimination:**

- a. The Commonwealth is committed to a policy of providing equal job opportunities on public contracts and prohibiting discrimination based on race, creed, color, sex, age, religion, national origin or disability in employment. KRS 45.560 – KRS 45.640.
- b. The utilization of minority vendors and subcontractors is encouraged, whenever possible, on public works contracts. The bidder and contractor should make full efforts to locate minority business persons. KRS 45A.610.
- c. Unless exempted in accordance with KRS 45.590, the provisions of KRS 45.560 – KRS 45.640 shall be binding upon the declared successful bidder and the resulting contract shall contain the provisions set forth in KRS 45.570(2).
- d. Unless a bidder is exempt under KRS 45.560 – KRS 45.640, the apparent successful bidder shall submit to the purchasing agency in the manner described and on the form(s) required, the information required by KRS 45.600 within five (5) calendar days of being declared the apparent low bidder. The form(s) shall be reviewed by the FAC Office of Equal Employment Opportunity and Contract Compliance.

#### **17. Performance and Payment Bonds:**

- a. Pursuant to KRS 45A.190 and KRS 45A.195, a bidder shall deliver the required performance and payment bonds to the purchasing agency upon notification of intent to award, or, with the approval of the purchasing officer, within fourteen (14) calendar days after that date. Otherwise, the Commonwealth may determine that the proposed awardee has abandoned the Bid Response and the bid shall become null and void.
- b. Unless otherwise specified in the bidding documents, the bonds shall be written on the form bound in the bidding document in the number of copies to be specified by the purchasing officer.
- c. A bidder shall require the attorney-in-fact, who executes required bonds on behalf of the surety, to affix thereto a certified and current copy of his/her Power of Attorney. The date of the Power of Attorney shall not precede the date of the bonds. The bonds shall be executed with a licensed resident or non-resident agent, who represents insurance companies authorized to do business in Kentucky.

#### **18. Award of Contract:**

- a. The issuance of an award of a contract is contingent upon securing an acceptable bid that is within the amount of budgeted funds and determining that the award of contract is in the best interest of the Commonwealth.
- b. Unless otherwise provided in the bidding documents, the Agreement between the Commonwealth and the contractor shall be written on the standard form of agreement bound within the Solicitation. The Commonwealth shall not be required to enter into or sign further agreements, leases, company orders or other documents to complete the Agreement.
- c. The Commonwealth's acceptance of the bidder's offer in response to the Solicitation, indicated by the issuance of a contract award, shall create a binding agreement between the parties consisting of the documents listed below. In the event of a conflict between the provisions contained in the contract, the order of precedence shall be in the same listing order as below.
  - 1. Solicitation including any addenda;
  - 2. Specifications;

3. Special Conditions;
4. General Conditions;
5. Technical provisions of the specifications;
6. Drawings/plans; and
7. Bid Response to the Solicitation.

**19. Award of Construction and Construction-Related Contracts:** Capital construction funded contracts require properly authorized Appropriation, Allotment, Revenue Budget, Project Management Master and Journal Voucher Transfer documents (SAS-5, SAS-14) for award of contract and allocation of construction funds. The issuing agency shall execute a construction contract using agency or general fund accounts on the basis of a duly signed agency Purchase Request.



**FINANCE AND ADMINISTRATION CABINET  
DEPARTMENT FOR FACILITIES MANAGEMENT  
DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION**

**GENERAL CONDITIONS of the Contract for Construction**  
**- General Contractor**

These **General Conditions of the Contract for Construction – General Contractor** have been implemented by the Kentucky Division of Engineering and Contract Administration for the purpose of delineating the provisions of the Contract for Construction when the Commonwealth has entered into a Contract with a General Contractor to accomplish a Capital Construction Project. The Document as a whole outlines the primary obligations and basic expectations for each entity involved in the Project.

These General Conditions apply to each section of the specifications and to the Contract Documents as a whole and are binding upon the Contractor and all Subcontractors as each are subject to the provisions contained herein.

These General Conditions are intended to define and establish certain definitions, procedures, rules and provisions of the Contract governing the operation so that the Work may be continued and be completed in an orderly, expeditious and workmanlike manner.

These General Conditions, together with the specifications and Contract Documents, shall further establish the standards of material and workmanship for the Work.

Specific Project requirements may alter the provisions indicated herein where strict adherence to the provisions of this document are not warranted or applicable. The Special Conditions and Supplemental Conditions contained in the Contract Documents, if present, modify and take precedence over the provisions of these General Conditions for this specific Project.

These General Conditions are based on and are consistent with the specific Kentucky Revised Statutes passed by the Kentucky Legislature and signed into effect by the Governor; specific Kentucky Administrative Regulations promulgated by State Agencies to enhance and clarify procedures that are authorized by a specific statute; specific Finance Cabinet Administrative Regulations; and the DECA Procedures Manual.

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## **Articles**

### **'1. Definitions of Terms**

Wherever used in these General Conditions or in other Contract Documents, the following terms have the meaning indicated which are applicable to both the singular and plural thereof:

**'1.1 Addenda** Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Bidding Requirements or the Contract Documents. An Addendum supersedes related provisions of the Contract Documents which are clarified, corrected or changed by the addenda.

**'1.2 Agency or Using Agency**, defined by KRS 45a.030, and is the state government entity which utilizes the Work being contracted. The Agency is a "client" of the Owner and advises the Owner of the needs, requirements and desires of the Agency related to the project. The Owner consults with the Agency on matters related to the Project. The Agency does not possess the legal authority of the Owner (see KRS 45a.045).

**'1.3 Architect, Engineer or Consultant (A-E)** is the person or entity, either a registered Architect, Registered Engineer, or Consultant, who is identified as such in the Contract Documents and on the drawings or any replacement Registered Architect, Registered Engineer, or consultant identified by the Owner. The A-E is a separate contractor and not an agent of the Owner. The term includes any associates or consultants employed by the A-E to assist in providing the required professional services to the Owner.

**'1.4 Certification of Payment** is the Owner's Progress Payment Forms, DOA-24 and DOA-25. All Payments made to the Contractor under this contract shall be on the appropriate Owner's Progress Payment Form.

**'1.5 Change Order** means a written order to the Contractor executed by the Owner and the A-E after execution of the Contract, directing a change in the Work and may include a change in the Contract Price or the Contract Time, or any combination thereof. There shall be no authorized changes in the Work, which affect either Contract Price or Contract Time, without a fully executed Change Order, except as provided elsewhere herein.

**'1.6 Contract** is the legal relationship, duties and obligations between the Owner and Contractor as evidenced by the Contract Documents for the Project.

**'1.7 Contract Time** is the number of calendar days between the Date of Commencement and the dates set for Substantial Completion and Final Completion of the Work, including any adjustments thereto, all as established in the Contract between Owner and Contractor

**'1.8 Contract Documents** include the Invitation for Bids, the Instructions to Bidders, the Payment and Performance Bonds, the General Conditions, the Special or Supplemental Conditions, the drawings, specifications, solicitation addenda, the contractors response to the solicitation, any written clarification of the response, the award document containing the Agreement between Owner and Contractor, and modifications issued after execution of the Contract. Modifications include (1) Change Orders issued as provided in Article 14, and (2) Field Orders for minor changes in the work issued by the A-E as provided in Article 14. Documents not included or expressly contemplated in this Paragraph, 1.8, do not, and shall not, form any part of the Contract between the Owner and the Contractor.

**'1.9 Contract Sum** means the sum stated in the Contract including any authorized adjustments thereto and is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

**‘1.10 Contractor or General Contractor** means the person or entity with whom the Owner has executed the Contract for construction. The Contractor may also be referred to as General Contractor. The Contractor shall hold his subcontractors, suppliers and others under his employ or contract to the terms and conditions of the Contract Documents.

**‘1.11 Damages for untimely performance** means a calculated monetary amount to be paid to the Owner, based on real costs which the Commonwealth incurs, due to the Contractor's failure to complete the Work within the allowable time identified in the Contract Documents. This term may also be referred to as "Liquidated Damages" where the actual cost of damages for untimely performance cannot be readily calculated and a definite sum is predetermined to be paid to the Owner. The amount of Liquidated Damages shall be defined in the Special Conditions of this Project.

**‘1.12 Date of Commencement** is the date specified in the Contract as the date upon which the Contractor is authorized to begin work. The Contract Time as set forth in paragraph 1.7 is determined using this Date of Commencement as the starting date.

**‘1.13 DECA Project Manager** means the person(s) delegated authority to act on behalf of the Owner. Such person(s) is employed by the Owner, DECA's Project Manager(s) will be designated at the Pre-Construction Meeting. DECA reserves the right to change its designated Project Manager(s) at any stage of the Work, for the sole purpose or benefit of the Commonwealth.

**‘1.14 Delay** means an event that causes an increase in the duration of the Project, or that changes the sequence of the Work or individual Work activities, thereby preventing completion of the Project within the time period specified in the Contract Documents. An event that does not cause an increase in the duration of the Project or prevents the completion of the Project within the time period specified in the Contract Documents, such as an event that is not on the critical path of the project schedule, is not a delay under this Contract.

**‘1.15 Direct Expenses** is defined as "All items of expenses directly incurred by or attributable to a specific project, assignment or task" and "Direct costs consist of direct materials, direct labor, subcontract costs, and other miscellaneous direct costs such as bonding and equipment rentals, that are directly related to and can be specifically attributed to an individual contract."

**‘1.16 Drawings** are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams. Where it is obvious that a drawing illustrates only a part of the given work or of a number of items, the remainder shall be deemed repetitious and so construed.

**‘1.17 Document Collaboration** is the Owner's web-based document collaboration system that shall be used by all project participants for the submission, transmittal, transfer, review, approval, processing of all documents related to this project. Where the General Conditions, the technical specifications, or the Contract for Construction indicates that a submission of documents is required, this submission shall be through the Owner's Document Collaboration System.

**‘1.18 Extra Work** as used in Article 14 is defined as Work not part of the existing Contract Documents which is being added to the Contract by a fully executed Change Order.

**‘1.19 A Field Order** is a written order issued by the A-E which clarifies or interprets the Contract Documents, or orders minor changes in the Work which does not require a change under Article 14. Field Orders are issued to the Contractor through the Owner's Document Collaboration System. Field Orders are also called A-E's Supplemental Instructions (ASIs).

**‘1.20 Final Completion** is defined as the Work being acceptable under the Contract Documents and the Contract fully performed in accordance with the terms and conditions of the Contract Documents and the entire payment balance due the Contractor is due and payable.

**'1.20.1 Final Completion Date** shall have the meaning as described to it in Article '19.5.

**'1.21 Notice of Intent to Award** is a written letter issued to the apparent successful contractor after acceptance of bid price, unit prices, subcontractors and equipment and materials to inform them of such acceptance and request the required additional documentation to initiate the Contract. **This is NOT an authorization to proceed.**

**'1.22 Owner** means the Commonwealth of Kentucky, acting through the Finance and Administration Cabinet and its Administrative Agent, the Department for Facilities and Support Services, Division of Engineering and Contract Administration. The Owner is represented solely by the Division of Engineering and Contract Administration. The Owner is represented by the DECA Project Manager for the specific Project.

**'1.23 The Project** is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by other Contractors, working under separate Contract with the Owner.

**'1.24 Resident Observer** means an individual who has a direct contract with the A-E to observe and report on activities at the work site. A Resident Observer employed by the A-E is not authorized to serve as the Owners Representative, unless so designated by the Owner in writing.

**'1.25 Retainage** means money earned by a contractor for work accepted by the Owner, but withheld to ensure proper performance by the contractor. Retainage is further defined in Article '18.

**'1.26 Shop Drawings** means drawings, completion diagrams, schedules, and other data specially prepared for the Work by the Contractor or any Subcontractor, lower tier subcontractors, manufacturer, supplier, or distributor to illustrate some portion of the Work. Shop Drawings and other submittals from the Contractor to the A-E shall be transmitted through the Owner's Document Collaboration System. Unless other requirements are indicated in the Special Conditions for this project or unless otherwise permitted by the A-E in writing, all shop drawings required by the Contract Documents shall to be submitted to the A-E for review and acceptance within the time indicated below:

**'1.26.1 For Projects of less than 180 calendar day duration:** thirty (30) calendar days of the Date of Commencement.

**'1.26.2 For Projects of more than 181 calendar days and less than 360 calendar days duration:** less than sixty (60) calendar days of the Date of Commencement.

**'1.26.3 For Projects of more than 361 calendar days duration:** less than ninety (90) calendar days of the Date of Commencement.

**'1.26.4 In circumstances where a specific shop drawing required by the Contract Documents cannot reasonably be submitted** to the A-E for review and acceptance, the Contractor shall notify the A-E in writing within the time periods indicated above for submission, and if the A-E finds it reasonable to waive this submission time period requirement, the A-E may do so in writing.

**'1.26.5 In circumstances where a specific shop drawing required by the Contract Documents cannot be reasonably reviewed by the A-E within the time prescribed elsewhere in the Contract Documents,** the A-E shall notify the Contractor in writing prior to the date required for the review of the reasons for the time needed for reviewing the Shop Drawing.

**‘1.27 Specifications** are the descriptive and written portions of the Contract Documents, wherever located and whenever issued, that describe the quality and performance of building materials and systems, using code citations and published standards. The drawings and specifications are complementary, together providing the information required for a complete facility. However, the specifications overrule the drawings where there is a conflict or contradiction. However, the Contractor shall inquire of the A-E for a determination of the resolution of the conflict or contradiction.

**‘1.28 Subcontractor** means the person or entity having a direct contract with the Contractor for the performance of a part of the Work. The Owner has no direct contractual relationship with the subcontractor.

**‘1.29 Substantial Completion** is the point at which, as certified in writing by the A-E and accepted by the Owner that the Project is: 1) at a level of completion in strict compliance with the Contract (see article ‘19.4 for a complete listing of requirements for compliance); 2) all necessary approvals by public authorities has been given; and, 3) that the Owner or the Agency can enjoy beneficial use or occupancy and can use, operate and maintain (the Owner has received all required warranties and documentation) it in all respects, for its intended purpose. Partial use or occupancy of the Project shall not result in the Project being deemed substantially complete and such partial use or occupancy shall not be evidence of Substantial Completion.

**‘1.29.1 Substantial Completion Date** shall have the meaning as described to it in Article 19.

**‘1.30 Warranty, General.** The Contractor shall warrant all equipment, materials, products, and workmanship provided by the Contractor under these Contract Documents for a period of twelve (12) months after the Date of Final Completion. This period of time is called the One-Year Warranty Period and is further defined in Article 9.2.

**‘1.31 The Work** includes the construction and services required by the Contract Documents, whether completed or partially completed, and includes all labor, supervision, materials, equipment, services, and things provided or to be provided by the Contractor to fulfill the Contractor's obligations.

## **‘2. Intent and Interpretation**

**The A-E shall be the authority of the Contract Documents as to their intent or interpretation,** except as defined below and/or as provided in paragraph 3.4.

**‘2.1** Anything that may be required, implied or inferred by the documents which make up the Contract, or any one or more of them, shall be provided by the Contractor for the Contract Sum;

**‘2.2** Nothing contained in the Contract Documents shall create, nor be interpreted to create, privity or any other relationship whatsoever between the Owner and any person except the Contractor;

**‘2.3** When a word, term, or phrase is used in the Contract Documents, it shall be interpreted or construed first, as defined herein; second, if not defined, according to its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, according to its common and customary usage;

**‘2.4** The words “include”, “includes”, or “including”, shall be deemed to be followed by the phrase, “without limitation”.

**‘2.5** The specification herein of any act, failure, refusal, omission, event, occurrence or condition as constituting a material breach of the resulting Contract shall not imply that any

other, non-specified act, failure, refusal, omission, event, occurrence or condition shall be deemed not to constitute a material breach of the resulting Contract;

**'2.6** In the event of any conflict, discrepancy, or inconsistency, the following shall control:

**'2.6.1** As between figures given on plans and scaled measurements, the figures shall govern; When two or more figures given on the plans are in conflict, the Contractor shall inform the A-E of such conflict immediately and the A-E shall clarify the correct figure to be used. The Contractor shall not proceed with any work related to the figures in conflict until the A-E has provided this clarification.

**'2.6.2** As between large scale plans and small scale plans, the large scale plans shall govern;

**'2.6.3** As between plans and specifications, the requirements of the specifications shall govern; When there is a conflict between the plans and specifications, the Contractor shall inform the A-E of such conflict immediately and the A-E shall clarify the correct interpretation to be used. The Contractor shall not proceed with any work related to the conflict until the A-E has provided this clarification.

**'2.6.4** When any conflict, discrepancy, or inconsistency exists as described in Article '2.6, and when there is a necessary determination by the A-E, with agreement by the Owner, that the provisions indicated above do not result in the proper interpretation and resolution of the conflict, the A-E may provide written directive as to how the conflict is to be resolved.

**'2.6.4.1** When such written directive, as indicated in '2.6.4 results in a cost difference to properly resolve the conflict, discrepancy, or inconsistency, a cost adjustment may be determined by the A-E to be appropriate.

**'2.6.4.2** The Contractor shall notify the A-E/ Owner of his proposed necessity of a cost difference result within fourteen (14) calendar days of the receipt of the directive to resolve the conflict.. However, should the Contractor proceed with the work related to the conflict resolution without written notice of the proposed cost difference to the A-E within the prescribed time, no cost adjustment will be granted.

**'2.7 Meaning of Execution.** Execution of the Contract Documents by the Contractor is a representation that the Contractor has thoroughly examined the site of the Work, become familiar with the local conditions under which the Work is to be performed, and correlated personal observations with the requirements of the Contract Documents.

**'2.7.1** Execution of the Contract Documents is a further representation that Contractor has received, reviewed and carefully examined all of the Contract Documents, and has found them in all respects to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, the Contractor is fully qualified to act as the contractor for the Project and has, and shall maintain, any and all licenses, permits or other authorizations necessary to act as the contractor for, and to construct the Project.

**'2.8 Prior Agreements.** The Contract Documents supersede any and all prior discussions, communications, representations, understandings, negotiations or agreements between the Owner and the Contractor and the Agency and the Contractor.

**'2.9 Contractor's Performance.** The Contractor shall perform all of the Work required, implied or reasonably inferable from the Contract including, but not limited to, the following:

**'2.9.1** Construction of the Project;

**‘2.9.2** The furnishing of any required surety bonds and insurance;

**‘2.9.3** The provision or furnishing, and prompt payment therefor, of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, fuel, heat, light, cooling, or other utilities, required for construction and all necessary building permits and other permits required for the construction of the Project;

**‘2.9.4** The creation and submission to the A-E of detailed and comprehensive record drawings and specifications, depicting all as-built construction. Said as-built drawings shall be submitted to the Owner by the A-E upon Final Completion of the Project and receipt of same by the Owner shall be a condition precedent to final payment to the Contractor and to the A-E.

**‘2.10 Time.** All limitations of time set forth in the Contract Documents are material and are of the essence of the Contract. The Contractor shall execute the work in such a manner as consistent with the limitations of time set forth. The Contractor shall make reasonable progress on the completion of the Work on a continual and consistent basis. Any failure of the Contractor to execute the Work in a timely manner consistent with the limitations of time set forth in the Contract Documents may be deemed at a Material Breach of Contract.

**‘2.11 Intent of Contract Documents.** The intent of the Contract Documents is to include all items necessary for the proper completion of the Work by the Contractor. Labor or materials which are evidently necessary to produce the desired results, even though not specifically mentioned in the Contract Documents, shall be included in the Work. The A-E is the interpreter of the Contract Documents and where any clarification regarding interpretation of the Documents is required the A-E shall be notified in writing pursuant to paragraph 2.13 below.

**‘2.12 Contract Documents Complementary, etc.** The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. In case of conflicts between the various Contract Documents, the order of precedence shall be as follows: (1) Addenda, (2) Special Conditions, (3) General Conditions, (4) Division 1 - General Requirements of the Specifications; (5) Technical provisions of the Specifications; (6) Drawings.

**‘2.13 Questions to A-E.** In the event a question arises regarding the meaning or intent of the drawings and specifications, the Contractor shall report it at once to the A-E by the submission of a Request for Information through the Owner's Document Collaboration System. The A-E shall furnish, with reasonable promptness, as defined by the Contract between the Owner and the A-E, additional instructions, by means of drawings or otherwise, necessary for the proper execution of the work, consistent with the requirements of Article 3.

**‘2.14** Paragraph, titles, headings, and drawing numbers are for convenience only and form no operative part of the Contract. The General Contractor, and by the "flow down" provisions of these General Conditions, every subcontractor, shall provide all Work defined, identified, enumerated, specified or otherwise indicated to be provided by the Contract Documents.

### **‘3. The Architect, Engineer, Consultant (A-E)**

**Unless otherwise directed by the Owner in writing, the A-E shall perform those duties and discharge those responsibilities allocated to the A-E in the Contract Documents.** The duties, obligations and responsibilities of the A-E shall include, but are not limited to, the following:

**‘3.1 Owner's Representative.** The A-E will be the Owner's Agent during construction, through issuance of final payment, and during the contractor's One Year Warranty period. The A-E will advise and consult with the Owner. In the event the Owner should find it necessary or



convenient to replace the A-E, the Owner shall retain a replacement A-E and the role of the replacement A-E shall be the same as the role of the A-E.

**'3.2 Communication through A-E.** Except as otherwise provided in the Contract Documents, the Owner's instructions to the Contractor shall be through the A-E and the Contractor's communications with the Owner shall be through the A-E. Should the contractor act on communications from any other entity, other than through the A-E, he is acting at his own risk and may be required to reverse the actions taken as his own expense.

**'3.2.1 All documents related to this project shall be submitted, transmitted, transferred, reviewed, approved or rejected, and/or otherwise processed using the Owner's Document Collaboration System** which is the Owner's web-based document collaboration system that shall be used by all project participants. No submission, transmittal, transfer, review, approval or processing shall be deemed Official without the use of this system.

**'3.2.1.1 All documents transmitted for purposes of administration of the Contract** are to be in electronic (PDF) format and transmitted via the Commonwealth's Document Collaboration System that receives, logs and store documents, processes documents through workflows and notifies addressees via email.

**3.2.1.2 The A-E/ Engineer and the Contractor are required** to become familiar with this system, to use this for all official transmittal of information pertaining to this project, and to respond to the requirements of this system within a reasonable time as defined elsewhere herein and/or by the terms of their Contract with the Owner.

**3.2.1.2.1 Training:** The Owner has an agreement with the service provider of the Document Collaboration System to provide training, support and assistance to users of the system via a web-based training session which can be arranged upon request. Further training as may be required by a specific user of the system is the responsibility of the user of the system.

**'3.3 Review of Work.** The A-E shall approve, or respond otherwise, in a timely manner, as defined by the Contract between the Owner and the A-E, as necessary concerning shop drawings or other submittals received from the Contractor. Should the A-E have reasonable cause to be unable to approve, or respond otherwise to submissions from the Contractor, the A-E shall provide written explanation of the reasonable cause within the timely manner, as defined by the Contract between the Owner and the A-E.

**'3.3.1 The A-E shall be authorized to refuse to accept work** which is defective or otherwise fails to comply with the requirements of the Contract. The A-E shall refuse the work in writing when he deems it necessary to refuse the work. If the A-E deems it appropriate, the A-E shall be authorized to call for extra inspection or testing of the work for compliance with requirements of the Contract.

**'3.3.1.1 The costs of the extra inspection or testing** shall be paid by the Contractor, unless the results of the extra inspection or testing find that the work was originally in conformance with the Contract requirements and that the extra inspection or testing was not necessary. A reduction in the Contract Sum shall be provided by Change Order to reimburse the Owner for the costs of the extra inspection or testing.

**'3.3.1.2 In cases where the Contractor covers up work** that is required by the Contract Documents to be inspected or tested prior to the inspection or testing, the cost of uncovering the work and performing the inspection or testing shall be at the

Contractor's expense even if the work is found to have been originally in conformance with the Contract Documents. A reduction in the Contract Sum shall be provided by Change Order to reimburse the Owner for the costs of the extra inspection or testing.

**'3.3.2 The A-E shall review the Contractor's Payment Requests** and shall approve in writing those amounts which, in the opinion of the A-E, are properly owing to the Contractor as provided in the Contract. The A-E shall perform this review, approval and submission of his recommendation to the Owner, within ten (10) business days of receipt of the Payment Request from the General Contractor.

**'3.3.3** The A-E shall perform those inspections required by the Owner.

**3.4 Interpretation of Contract Documents.** The A-E shall be the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder by the Contractor, subject to the provisions of Article 26.

**'3.4.1 Claims, disputes, and other matters in question** that arise relating to the execution or progress of the Work shall be referred initially to the A-E for decision, which he will render in writing within a reasonable time, as defined by the Contract between the Owner and the A-E.

**'3.4.2 Should the Contractor find disagreement with the A-E** as to the proper interpretation of the Contract Documents or other decision of the A-E, he must refer the A-E's decision to the Director of the Division of Engineering in writing within seven (7) days. The Director of the Division of Engineering will then discuss and negotiate the A-E's decision with the A-E to seek reasonable resolution of the matter. Following these discussions and negotiations, the A-E's initial decision or revised decision shall be binding, unless the Contractor appeals the A-E's initial or revised decision to the Secretary of the Finance and Administration Cabinet in accordance with the provisions of Article 26.

**'3.4.3 Should the Director of the Division of Engineering find disagreement with the A-E** as to the proper interpretation of the Contract Documents or any other decision of the A-E, the Director of the Division of Engineering may appeal the A-E's initial or revised decision to the Secretary of the Finance and Administration Cabinet in accordance with the provisions of Article 26.

**'3.4.4 The A-E shall have authority to reject Work** which does not conform to the Contract Documents. In the event of rejection, the A-E may recommend in writing withholding payment to the Contractor for the rejected Work, and such recommendation shall give the Owner the authority to withhold payment for such Work.

**'3.5 Review of Shop Drawings, etc.** The A-E shall review and approve, or take other appropriate action upon Contractor's submittals (such as Shop Drawings, product data, and samples) for conformance with the design concept and the information given in the Contract Documents. Such action shall be taken with reasonable promptness, as defined by the Contract between the Owner and the A-E, so as to cause no delay. The A-E may determine concurrently with the Contractor the timing and scheduling of the A-E's Review, with the understanding that some submittals are more critical to the Critical Path of the Completion of the project than others.

**'3.5.1 The A-E's approval** of a specific item shall not indicate approval of an assembly of which the item is a component. The A-E's approval of Shop Drawings or samples shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless the Contractor has in writing called the A-E's attention to such deviation at the time of submission and the A-E has given written approval to the specific deviation, nor shall any approval by the A-E relieve the Contractor from responsibility for errors or omissions in the Shop Drawings.



**'3.5.2 If, for any reason, any item specified and approved by the A-E as a shop drawing submittal, will not be available when needed** in the course of the work, and Contractor can show he has made a reasonable, persistent effort to obtain item in question, the Contractor is to notify the A-E in writing, immediately, and the A-E will either determine the source of the supply or arrange with the Owner for appropriate substitution, within the terms of the Contract. Otherwise, the Contractor will not be excused for delays in securing materials or products specified, and will be held accountable if completion of the project is thereby delayed.

**'3.6 Preparation of Change Orders.** The A-E, in consultation with the Owner, shall prepare Change Orders. The A-E shall also have authority to order minor changes in the Work as provided in Article 14.2.

**'3.7 Final Inspections, Certification.** The A-E, in consultation with the Owner, shall conduct inspections to determine the dates of Substantial Completion and Final Completion. The A-E shall also receive and forward to the Owner, for the Owner's review, written warranties and related documents required by the Contract and assembled by the Contractor.

**'3.8 The A-E shall review the Contractor's Payment Requests** and shall approve in writing those amounts which, in the opinion of the A-E, are properly owing to the Contractor as provided in the Contract. The A-E will perform this review, approval and submission of his recommendation to the Owner, within ten (10) business days of receipt of the Payment Request from the Contractor.

**3.8.1 When there is reasonable justification that causes the A-E to be unable to perform this review, approval and submission of his recommendation to the Owner within the time prescribed in paragraph 3.8 above,** the A-E will notify the Contractor in writing as to the justification and as to the time that will be required for this review, approval and submission of his recommendation to the Owner.

**'3.8.2 The Contractor may submit no more than one (1) payment request** each thirty (30) calendar day period, except where specifically agreed by the Owner that additional payment requests may be submitted within the thirty (30) calendar day period for reasons consistent with the Contractor's performance of the Contract.

**'3.9 The A-E, in consultation with the Owner, shall be authorized to require the Contractor to make changes or deviations in the work** which do not involve a change in the Contract Sum or in the Contract Time for the Contractor's performance consistent with the intent of the Contract. The A-E shall make such changes or deviations in the work by written Field Order.

**'3.10 The duties, obligations and responsibilities of the Contractor under the Contract** shall in no manner whatsoever be changed, altered, discharged, released, or satisfied by any duty, obligation or responsibility of the A-E. The Contractor is not a third-party beneficiary of any Contract by and between the Owner and the A-E. It is expressly acknowledged and agreed that the duties of Contractor to the Owner are independent of, and are not diminished by, any duties of the A-E to the Owner.

**'3.11 The duties, obligations and responsibilities of both the A-E and the Contractor,** under their respective Contracts, shall in no manner whatsoever be changed, altered, discharged, released, or satisfied by any duty, obligation or responsibility of the Resident Observer. It is expressly acknowledged and agreed that the duties of Contractor and/or A-E to the Owner are independent of, and are not diminished by, any duties of the Resident Observer to the A-E/Owner. A copy of the Resident Observers Duties, Responsibilities and Limitations

are enumerated in the DECA Procedures Manual, are to be discussed at the Pre-Construction Meeting and are by reference made a part of these General Conditions.

#### **‘4. Construction Schedule**

**The Contractor, within fifteen (15) days of the Date of Commencement shall prepare and submit for the Owner and A-E’s approval a construction schedule for completing the Work.** This submission shall be transmitted through the Owner’s Document Collaboration System. The schedule shall indicate the starting and completion dates of the various stages of the Work, shall not exceed time limits established by the Contract Documents for the various stages of Work, shall be updated monthly and furnished to the Owner and A-E, shall be related to the Work of any other contractors on the Project to the extent required by the circumstances, and shall provide for expeditious and practicable execution of the Work. *Progress Payments to the Contractor are contingent upon receipt of the updated monthly project schedule and schedule of submittals.*

**‘4.1 Time Frame of Schedule:** *Extend schedule form date established for commencement of the Work (the Notice of Award or Notice to Proceed) to Substantial Completion, to Final Completion, and indicating all critical milestones along the time of the schedule.*

**‘4.1.1 Work by Owner:** *Include a separate activity for each portion of the Work to be performed by the Owner or by others working under separate contract with the Owner.*

**‘4.1.2 Products Ordered in Advance:** *Include a separate activity for each product pre-ordered by the Owner. Include the delivery date indicated in the Special Conditions or as relayed to the Contractor from the Owner.*

**‘4.1.3 Work Restrictions and “blackout dates”:** *Show the effect of specified work restrictions and “blackout dates” as defined in the Special Conditions.*

**‘4.1.4 Commissioning:** *Show separate activities for each building system to receive commissioning by others working under separate contract with the Owner, allowing sufficient time for functional startup, commissioning, correction of commissioning issues and final commissioning. Note: Commissioning must be accomplished in its entirety by the Date of Substantial Completion.*

**‘4.1.5 Testing and Balancing:** *Show separate activity for testing and balancing by others working under separate contract with the Owner. Note: Testing and Balancing must be accomplished in its entirety by the Date of Substantial Completion.*

**‘4.2 The original schedule** shall be accompanied by a proposed schedule of values as described in Article 18.1. The original Project Schedule, Schedule of Submittals and the Schedule of Values are to be submitted to the A-E, reviewed and accepted by the A-E and the Owner, prior to submittal of the first Progress Payment. No payment will be made to the Contractor without an approved Schedule of Values and a Project Schedule.

**‘4.2.1 The original schedule** shall show the project being completed on the established Date of Substantial Completion. To do this, the Contractor shall include in the flow of work any existing “float” which may be identified during the layout of the project schedule.

**‘4.2.2 The Contractor acknowledges that all float** (including Total Float, Free Float, and Sequestered Float) is a shared commodity available to the Project and is not for the exclusive benefit of any party; float is an expiring resource available to accommodate changes in the Work, however originated, or to mitigate the effect of events that may delay performance or completion of all or part of the Work.

**‘4.3 The Contractor shall promptly notify the A-E and Owner** if the Contractor is materially ahead of, or behind the updated construction schedule. Failure to so notify the A-E and Owner shall relieve the Owner from liability for damages caused by delay or impact. Strict compliance with the requirements of this article shall be a condition precedent to payment to the Contractor, and failure by the Contractor to strictly comply with said requirements shall constitute a material breach of the Contract.

**‘4.3.1 On projects where a CPM schedule is required, the Contractor shall report on the status of any “float”,** including the addition of “float”, the use of “float”, and the anticipation of the use of “float” at each project Progress Meeting.

**‘4.4 For projects with a Contract Sum of \$1,000,000 or greater** the schedule shall be in critical path method (CPM) format. The schedules shall include all activities necessary for performance of the work showing logic (sequences, dependencies, etc.) duration of each activity with the critical path highlighted. The schedules shall include, but not be limited to, submittal processing and review time required by the A-E, fabrication and delivery of materials, construction, testing clean-up, work and/or materials to be provided by the Owner, dates and durations for major utility outages requiring coordination with the Owner and the Owner’s operations, and significant milestones related to the completion of the Project.

**‘4.4.1 For projects where the CPM format is required for schedules,** any subsequent adjustment, modification or change in the schedule shall include an indication of the original Critical Path and the adjustment, modification, or change shall clearly delineate the adjustment, modification or change in the schedule and shall be accompanied by a written statement of the cause and reason for the adjustment, modification or change.

**‘4.4.2 For projects where the CPM format is required for schedules and subsequent adjustment, modification or change in the schedule** does not include the information required by paragraph 4.3.1 above, the revised schedule shall be rejected and payment of the Contractor’s General Conditions costs suspended until this provision is complied with satisfactorily.

**‘4.5 Work Hours on site shall be coordinated with the A-E, Owner and Using Agency and shall be initially defined and scheduled at the Pre-Construction Conference,** adjusted by notification to the A-E, Owner and Using Agency during each monthly Progress Meeting, and shall comply with the following criteria:

**‘4.5.1 Generally, work hours on site shall be** from 7am to 4pm, weekdays, unless otherwise defined in the Special Conditions. However, unless restricted or modified by the Special Conditions, the Contractor may propose a different work hour schedule up to 24/7/365 with acceptance by the Owner.

**‘4.5.2 The Contractor shall have job site supervision on site** during any work hours scheduled and/or any extended work hours accepted by the Owner.

## **‘5. Shop Drawings; Submittals**

**‘5.1 Schedule for Submittals.** Prior to submission of the first application for payment and in sufficient time to allow the A-E reasonable time for review, the Contractor shall submit to the A-E a schedule of submittals which shall be coordinated with the construction schedule. This submission shall be transmitted through the Owner’s Document Collaboration System. The Contractor shall keep the schedule of submittals current and present an updated schedule of submittals at each project progress meeting. This schedule of submittals shall contain anticipated and actual dates of the submittal of shop drawings and shall be consistent with the requirements for scheduling submittals defined in Article 1.26 of these General Conditions.

**‘5.2 Submittals of Shop Drawings, Samples, etc.** The Contractor shall review, approve, and submit Shop Drawings, samples, and product data in accordance with the approved schedule as herein detailed.

**‘5.2.1 The Contractor’s stamp of approval** on any Shop Drawing or sample shall constitute a representation to Owner and A-E that the Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the Work and the Contract Documents.

**‘5.2.2 The A-E shall review and approve, with reasonable promptness** as defined by the Contract between the Owner and A-E, the Shop Drawings, or return for corrections as required. The review and approval shall be for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item will not indicate approval of the assembly in which the item functions.

**‘5.2.3 The Contractor shall make any corrections required** by the A-E for compliance to the Contract and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. The Contractor shall direct specific attention, in writing, or on resubmitted Shop Drawings, to revisions other than the corrections called for by the A-E on previous submissions.

**‘5.2.4 Where a Shop Drawing or sample submission is required** by the specifications, no related work shall be commenced until the submission has been approved by the A-E. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the A-E, Owner and Resident Observer.

**‘5.2.5 The A-E’s approval of Shop Drawings or samples** shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless the Contractor has in writing called the A-E’s attention to such deviation at the time of submission and the A-E has given written approval to the specific deviation, nor shall any approval by the A-E relieve the Contractor from responsibility for errors or omissions in the Shop Drawings.

**‘5.2.5.1 Conflicting Requirements:** 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 uncertainties and requirements that are different, but apparently equal, to the A-E for decision before proceeding with the work.

**‘5.2.6 The Contractor shall maintain a submittal log** which shall include, at a minimum, the date of each submittal, the date of any resubmittal, the date of any approval or rejection, and the reason for any approval or rejection. The Contractor shall provide copies of this submittal log with the current status of submittals clearly indicated therein to the A-E and the Owner at each progress meeting until such time as all submittals are complete and accepted.

**‘5.3 Photographic Documentation:** Provide Pre-Construction Photographs, Construction Progress Photographs and Substantial Completion construction photographs. Submit photographs in the Owner’s Document Collaboration System with a key plan or description of the location of the photograph taken.

**‘5.3.1 Pre-Construction Photographs:** Take a minimum of 20 photographs to show existing conditions of the project site and adjacent property prior to the start of construction activities. Take additional photographs as necessary to adequately document the existing physical conditions of all improvements to the project site or adjacent property that might be affected by the activities of construction.

**‘5.3.2 Construction Progress Photographs:** Take a minimum of 10 photographs DAILY to document the progress of construction. Take additional photographs as necessary to adequately document the progress of construction indicating all key elements of the construction and any significant progress.

**‘5.3.3 Substantial Construction Photographs:** Take a minimum of 20 photographs to show conditions of the project site and adjacent property at the time of substantial completion of the work at the conclusion of construction activities. Take additional photographs as necessary to adequately document the current physical conditions of all improvements to the project site or adjacent property that might have been affected by the activities of construction.

## **‘6. Documents and Samples at the Site**

**Unless otherwise provided in the Contract Documents, the General Contractor shall print and copy any drawings and specifications as are reasonably necessary for the execution of the Work.** Each Subcontractor shall have the ability to download the entire set of drawings and specifications at its option, however, every Subcontractor shall be responsible for the scope of their work indicated in any location throughout the drawings and specifications. There is NO GUARANTEE of the division of the scope of work to specific specifications sections or specific drawings.

**‘6.1 The Contractor shall maintain at the site** one record copy of the drawings, specifications, addenda, Change Orders and other modifications, in good order and marked currently to record changes and selections made during construction. Unless otherwise directed, the Contractor shall also keep approved Shop Drawings, product data, samples and similar required submittals on hand. These shall be available to the A-E, Owner, and Resident Observer as requested.

**‘6.1.1 When the Contractor fails to maintain the record copies indicated in paragraph 6.1 above,** payment of the Contractor's General Conditions costs may be suspended until this provision is complied with satisfactorily.

**‘6.2 Upon completion of the Work,** the record documents described above shall be delivered to the A-E for submittal to the Owner along with the as-built drawings.

## **‘7. Contract Documents Property of Owner**

**The Contract Documents, and each of them, as well as any other documents furnished by the Owner, shall remain the property of the Owner.** The Contractor shall have the right to keep one (1) copy of the Contract Documents upon completion of the Project; provided, however, that in no event shall the Contractor use, or permit to be used, any portion or all of such Contract Documents on other projects without the Owner's prior written authorization.

## **‘8. Supervision and Construction Procedures**

**‘8.1 Supervision of the Work.** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention so as to ensure expeditious, workmanlike performance in accordance with the requirements of the Contract Documents. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences



and procedures. He shall be responsible for the acts and omissions of persons directly employed by him, as he is for Subcontractors and others under Article 17. He shall be responsible for coordinating all portions of the Work under the Contract unless the Contract Documents give other specific instructions concerning these matters.

**'8.2 Obligation to Follow Contract Requirements.** The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by the activities or duties of the A-E in the A-E's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

**'8.3 The Contractor shall not perform Work without adequate plans and specifications,** or, as appropriate, approved Shop Drawings, or other submittals. If the Contractor performs Work knowing or believing it involves an error, inconsistency or omission without first providing written notice to the A-E and Owner, the Contractor shall be responsible for such Work and pay the cost of correcting same.

**'8.4 All Work shall strictly conform** to the requirements of the Contract Documents. The Contractor shall not commence or continue any portion of the Work where there is not a complete understanding of the requirements of the Contract Documents. When the Contractor believes that he does not have a complete understanding of the requirements of the Contract Documents, he shall immediately notify the A-E of this fact and shall issue a Request for Information to obtain this complete understanding of the requirements.

**'8.4.1 All branches of work shown on the plans or specified,** whether specifically mentioned or not, shall be executed in strict compliance with all local, state or federal regulations and codes, where the same have jurisdiction. Where the Contractor may be in doubt as the application of a state regulation or code on a specific branch of work, the Contractor shall ask for an interpretation from the A-E prior to proceeding with the work.

**'8.5 The Work shall be continually supervised,** the Contractor bearing full responsibility for any and all acts or omissions of those engaged in the Work on behalf of the Contractor

**'8.5.1 The Contractor shall prepare Daily Construction Reports** and submit these reports through the Owner's Document Collaboration System a minimum of weekly. Failure to submit these Daily Construction Reports in a timely manner shall be reason for withholding of General Conditions amounts from the Contractor's payment requests until such submittal is completed.

**8.5.2 The Contractor's Daily Construction Report shall contain as a minimum** the following information in enough detail as to provide an accounting of the construction site conditions, activities and issues:

- Contractor's Name
- Job Superintendent's Name
- Date of Report
- Weather Conditions – precipitation, temperature, etc.
- Manpower – by trade including number of workmen.
- Brief description of work performed that day.
- Conditions which delay progress of the work.
- Issues that arose needing resolution.
- Resolution of prior issues that were implemented.
- Project Photographs, where appropriate.

**'8.6 The Contractor shall at all times enforce strict discipline and good order** among his employees and Subcontractors and shall not employ on the Work any person not skilled in the Work assigned to him. Strict discipline shall include a prohibition of the use of drugs, alcohol or

any other controlled substance; prohibition of firearms or other weapons; prohibition of unnecessary contact with building occupants; and other objectives of good discipline.

**'8.7** The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Failure to provide proper job site supervision AT ALL TIMES THAT WORK IS IN PROGRESS shall be reason for a change order deduction of a portion of the General Conditions amounts from the Contractor's payment requests for the period of time that job site supervision is not provided.

**'8.8 The Contractor shall have a continuing duty** to read, examine, review, compare and contrast each of the Contract Documents, Shop Drawings, and other submittals and shall give written notice to the Owner and the A-E of any potential conflict, ambiguity, error or omission which the Contractor may find with respect to these documents and their adequacy and sufficiency for construction as required by the Contract before proceeding with the affected Work. The express or implied approval by the Owner or the A-E of any Shop Drawings or other submittals shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with the resulting Contract.

**'8.8.1 The Owner has relied upon the A-E to prepare** documents for the Project, including the plans and specifications for the Project, which are accurate, adequate, consistent, coordinated and sufficient for construction, and in issuing the Contract to the Contractor, the Owner's established legal duties to the Contractor notwithstanding, the Owner has relied upon the A-E's professional expertise in fulfilling its legal duty to the Owner in addition to the Contractor's full and good faith compliance with its duties set forth above.

**'8.9 Superintendent.** The Contractor shall employ a qualified, competent full-time superintendent and any necessary assistants. This superintendent shall be present on site at all times that Work of this contract is underway except with prior written consent of the A-E. It shall be the responsibility of the superintendent to coordinate the work of all the Subcontractors.

**'8.9.1 The Owner reserves the right to accept the Superintendent** selected by the Contractor. This full-time Project Superintendent shall be qualified and experienced to supervise the work of this Contract. The Contractor shall notify the A-E and Owner in writing for acceptance prior to any change in supervisory personnel. This change shall be for reasons outlined below.

**'8.9.1.1 The Contractor shall immediately replace a Superintendent upon written notice from the Owner that the current Superintendent is unsatisfactory.** The Owner has the right to require replacement of a Superintendent at any time that the Owner loses confidence in the Superintendent: to adequately perform the duties required of the Contract Documents: to complete the Work in strict adherence to the Contract Documents; to maintain the project schedule; or to be present at the project site at all times Work is in progress, except as authorized by the A-E. The Owner also has the right to require the replacement of the Superintendent for inappropriate or unprofessional conduct either on the project site or directed toward the A-E/ Engineer, the Owner's Representatives (DECA personnel), the Using Agency Representatives, or the general public.

**'8.9.2 This Superintendent shall have full and complete authority** to act on behalf of the Contractor in all matters related to this project, except as defined in written form by the Contractor and accepted in writing by the Owner. All instructions given to the superintendent shall be considered as given to the Contractor.

**'8.9.3 The superintendent shall not be changed** except under the following circumstances:

**'8.9.3.1** where the superintendent proves to be unsatisfactory to the Contractor or ceases to be in his employ, in which case the Contractor shall give timely prior written notice to the Owner of the impending change in superintendent and a reasonable explanation for the change; or

**'8.9.3.2** where the Owner has reasonable grounds for dissatisfaction with the performance of the superintendent and gives written notice to the Contractor of these grounds. The Contractor, upon receiving such written notice, shall replace the existing superintendent with a successor, to whom the Owner has no objection.

**'8.9.4 Should the Contractor not provide the superintendent as required by the Contract Documents to oversee all work being performed on this Contract,** the Owner has the right to deduct by Change Order the amount of General Conditions costs from the Contract Sum for the period in which proper Superintendence of the Work is not provided. This amount is determined by dividing the complete amount of General Conditions indicated in the approved Schedule of Values by the number of months of project duration according to the approved Project Schedule.

**'8.10 Contractor's Project Manager.** In addition to the Superintendent required in article '8.9, the Contractor may employ a qualified, competent Project Manager. In the absence of an assigned Project Manager, the principal owner of the Contractor's Company shall be considered as the Project Manager. This Project Manager is not required be present on site at all times that Work of this contract is underway, but shall be intimately familiar with the status of the Work of the Project at all times. It shall be the responsibility of the Project Manager to supervise the Superintendent and represent the Contractor in all matters.

**'8.10.1 The Owner reserves the right to accept the Project Manager** selected by the Contractor. This Project Manager shall be qualified and experienced to manage the work of this Contract and represent the Contractor in all matters. The Contractor shall notify the A-E and Owner in writing for acceptance prior to any change in project management personnel. This change shall be for reasons outlined below.

**'8.10.1.1 The Contactor shall immediately replace a Project Manager upon written notice from the Owner that the current Project Manager is unsatisfactory.** The Owner has the right to require replacement of a Project Manager at any time that the Owner loses confidence in the Project Manager to adequately perform the duties required of the Contract Documents: to manage the Work in strict adherence to the Contract Documents; to maintain the project schedule; or to supervise the Superintendent. The Owner also has the right to require the replacement of the Project Manager for inappropriate or unprofessional conduct either on the project site or directed toward the A-E/ Engineer, the Owner's Representatives (DECA personnel), the Using Agency Representatives, or the general public.

**'8.10.2 This Project Manager shall have full and complete authority** to act on behalf of the Contractor in all matters related to this project. All instructions given to the Project Manager shall be considered as given to the Contractor.

**'8.10.3 The Project Manager shall not be changed** except under the following circumstances:

**'8.10.3.1** where the Project Manager proves to be unsatisfactory to the Contractor or ceases to be in his employ, in which case the Contractor shall give timely prior written notice to the Owner of the impending change in Project Manager and a reasonable explanation for the change; or



**'8.10.3.2** where the Owner has reasonable grounds for dissatisfaction with the performance of the Project Manager and gives written notice to the Contractor of these grounds. The Contractor, upon receiving such written notice, shall replace the existing Project Manager with a successor, to whom the Owner has no objection.

**'8.10.4 Should the Contractor fail to replace an unsatisfactory Project Manager as required by written notice of the Owner,** the Owner has the right to deduct by Change Order the amount of General Conditions costs from the Contract Sum for the period in which there is a refusal to make the required replacement. This amount is determined by dividing the complete amount of General Conditions indicated in the approved Schedule of Values by the number of months of project duration according to the approved Project Schedule.

**'8.11 Temporary Support Facilities Required:** The Contractor shall provide temporary job offices for use by the Job Superintendent, A-E, Resident Observer (if applicable) and the Owner during the course of construction from the time of commencement of the Work until Substantial Completion. Provide electric, water, HVAC internet access and telephone for all areas of the temporary job office. This job office shall be large enough to accommodate project meetings and to provide for construction management operations. Where a Resident Observer is utilized on the project, a separate office shall be provided for the Resident Observer's use with electric, water, HVAC, telephone and internet access.

## **'9. Labor, Material, and General Contractor Warranty**

**'9.1 Contractor Provisions.** Unless otherwise stipulated, the Contractor shall provide and pay for all materials, supervision, labor, water, tools, equipment, light, power, temporary heat, hoist, supplies, appliances, transportation, and other facilities and things necessary for the execution and completion of the Work.

**'9.1.1 In the event the Owner elects to make available the electric power or domestic water, at no cost, to the Contractor for construction purposes,** the election to do so will be spelled out in the Special Conditions for this project. Available electric power provided by the Owner, at his election, shall not be utilized as a means for temporary heat without specific approval from the Owner in writing.

**'9.1.2 Additionally, the Owner reserves the right to cease to provide this available electric power and/or domestic water, at no cost to the Contractor,** should it be found that the electric power and/or domestic water is not reasonably used economically.

**'9.2 General Contractor Warranty.** The Contractor warrants to the Owner and A-E that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will strictly conform with the requirements of the Contract Documents.

**'9.2.1** The Contractor shall warrant all equipment, materials, products, and workmanship provided by the Contractor under these Contract Documents not only during the Contract period but also for a period of twelve (12) months after the Date of Final Completion.

**'9.2.1.1 The One Year Warranty period for correction of Work shall be extended with respect to portions of the Work first performed after the Date of Substantial Completion** by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**'9.2.2 Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.** While, the Contractor's warranty excludes remedy for damage or defect caused by abuse by the Owner or building occupants, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage, if the Work is not conforming to the requirements of the Work and that has been determined to be defective, is not excluded from the Contractor's One Year Warranty.

**'9.2.3 If, during the Contract Period or during the One Year Warranty period** (a) any equipment, materials or products furnished and/or installed by the Contractor are found to be defective in service by reason of the Contractor's faulty process, structural and/or mechanical design or specification, or (b) any equipment, materials, or products furnished and/or installed by the Contractor are found to be defective by reason of defects in material or workmanship, the Contractor shall, promptly after receipt of written notice from the Owner or A-E, repair or cause to be repaired such defective equipment, materials or products, or replace such defective equipment, materials, or products.

**'9.2.3.1 During the One Year Warranty Period for correction of the Work, if the Owner fails to notify the Contractor** and give the Contractor the opportunity to make correction, the Owner waives the right to require correction by the Contractor and to claim a breach of Warranty. However, this inaction during the Warranty Period by the Owner does not imply any limitation of the Contractor's liability as indicated in paragraph '9.2.7.

**'9.2.3.2 During the One Year Warranty Period for correction of the Work, if the Owner notifies the Contractor** and gives the Contractor the opportunity to make correction, and the Contractor fails to correct the Work with reasonable promptness, the Owner has the right to claim a breach of Warranty.

**'9.2.4 The Contractor's warranty shall not exclude** remedy for damage or defect caused by abuse by the Contractor, his subcontractors, or others within his control during the construction period or during work related to Contractor warranty.

**'9.2.4.1 Any portion of the Work required by the Contract Documents shall not be waived as a requirement for Completion of the Work**, except by specific written authorization from the Associate Director of the Division of Engineering and Contract Administration for reasons where, by no fault of the Contractor, could not be completed within the time established for Completion of the Work.

**'9.2.5 If during the Contractor's warranty period, there is a question concerning the quality or kind of materials and equipment installed in this project**, and requested by the A-E, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

**'9.2.6 In the event of multiple failures of major consequence in similar equipment, products, components or systems, prior to the expiration of the one-year warranty** described above, the affected equipment, product, component or system shall be disassembled, inspected, and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the equipment, product, component or system failure shall be replaced.

**'9.2.6.1 As used herein, multiple equipment, product, component or system failures shall be interpreted to mean** two (2) or more successive failures of the same kind in the same item of equipment, product, component or system or

failures of the same kind in two (2) or more items of equipment or product, or in a specific building system or component.

**'9.2.6.2 Major equipment failures may include**, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts or structural members, broken or chipped gear teeth overheating, premature bearing failure, excessive wear, or excessive leakage around the seals.

**'9.2.6.2.1 Equipment failures which are directly and clearly traceable to operator abuse**, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over or under lubrication and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one-year warranty.

**'9.2.6.3 Major product, component or system failures may include**, but are not limited to, failure of the item to perform as intended, excessive wear, discoloration due to defective finish application, leakage, or inadequacy of performance as specified.

**'9.2.6.3.1 Product, component, or system failures which are directly and clearly traceable to building user or operator abuse**, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over or under lubrication, using maintenance procedures not conforming with published maintenance instructions, and abuse or vandalism, shall be exempted from the scope of the one-year warranty.

**'9.2.6.4 Should multiple equipment, product, component or system failures occur** in a given item or type of equipment, product, component or system, all items of the same size and type shall be disassembled, inspected, modified or replaced, as necessary, and re-warranted for one year.

**'9.2.6.5 A new twelve (12) month warranty against defective or deficient design, workmanship, and materials** shall commence on the day that the item of equipment is reassembled and placed back into operation.

**'9.2.7 No specific provision of this Article nor any provision in the Contract Documents, nor any special guarantee time limit** implies any limitation of the Contractor's liability with the laws of the Commonwealth of Kentucky.

**'9.3 Substitution - Materials and Equipment.** Substitution of previously approved equipment and materials shall be submitted to the A-E for acceptance and will be considered only for the following reasons:

**'9.3.1** unavailability of the material or equipment due to conditions beyond the control of the Contractor

**'9.3.2** inability of the supplier to meet Contract schedule; or

**'9.3.3** technical and immaterial noncompliance to specifications.

Inclusion of a certain, make or type of materials or equipment by the Contractor shall not obligate the A-E or Owner to accept such material or equipment if it does not meet the requirements of the plans and specifications.

Substitutions not properly approved and authorized by the A-E and Owner may be considered defective work. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials and equipment.

**'9.4 Recycled Content:** KRS 45A.520 mandates that every state agency require a minimum recycled content for those materials it purchases. In accordance with 200 KAR 5:330, all listed products are to be offered by the awarded contractor ONLY as a recycled product. Except as provided in KRS 45A.510, construction related materials requiring a minimum recycled content include Building Insulation, Aluminum products, concrete, cement and steel products. For a complete listing of those items requiring minimum recycled content please refer to 200 KAR 5:330 <http://www.lrc.state.ky.us/kar/200/005/330.htm>

## **'10. Surveys, Permits, Fees, Notices, and Tests**

**'10.1 Owner-Furnished Surveys.** The Owner shall furnish whatever surveys are specifically required by the Contract Documents. Approvals, assessments, easements for permanent structures or permanent changes in existing facilities, and utility tap-on fees shall be secured and paid for by the Owner, unless otherwise provided in the Contract Documents.

**'10.1.1 Prior to start of Construction, the Owner will furnish all land and rights-of-way** necessary for the carrying out and completion of the Work to be performed under this Contract, except as outlined in the Special Conditions should any conditions exist at the start of construction which does not make this possible at the start of construction.

**'10.2 Permits.** Building, sewer, and water permits and similar kinds of permits required by local ordinances shall be obtained by the General Contractor. Note: no building permit fee shall be charged to or paid by the Contractor as the Commonwealth is exempt from such charges levied by Local Government Jurisdictions. The Contractor shall procure and pay for any necessary licenses to do business in the locale of the Work.

**'10.3 Notices.** The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities bearing on the performance of the Work.

**'10.4 Required Regulatory Tests and Inspections.** Regulatory agencies of the State and Federal governments having jurisdiction may require any Work to be inspected, tested or approved. The Contractor shall assume full responsibility therefore, including related costs, unless otherwise noted, and shall furnish the A-E the required certifications of inspection, testing or approval.

**'10.4.1 The Contractor shall pay the electrical inspection fees** directly to the Commonwealth of Kentucky, Department for Housing and Building Construction. The Electrical subcontractor is responsible for the payment of this fee. The Electrical subcontractor is responsible for coordination of the required electrical inspections as required by the Department for Housing and Building Construction.

**'10.5 Any delays by governmental agencies in obtaining Permits, Notices, Required Regulatory Tests and Inspections (10.2, 10.3, 10.4)** and not the fault of one of the parties shall be shared by the Contractor and Owner with appropriate time extensions only. Liquidated damages and Contractor compensation for such delays or impact are not applicable and shall not be payable.

**'10.6 Payment for Tests.** Tests of materials, products and equipment in place, required by the A-E or the Owner, to prove quality standards shall be paid by the Contractor. Should results of testing indicate that construction is not in compliance with Contract Documents, the Contractor shall bear the cost of any additional tests of the materials, products or equipment.

**'10.6.1 The Contractor shall give the A-E timely notice** of readiness of the Work for all inspections, tests or approvals. This timely notice of readiness shall be no less than 72 hours except by prior agreement between the A-E and the Contractor.

**'10.7 Local Building Permits and fees.** The Commonwealth's Construction projects are exempt from Building Permit requirements of Local Governments. The Contractor is not obligated to obtain a local building permit or to pay a building permit fee. However, this exemption does not waive the requirement for fees to make connection to utilities owned by a local municipality, Local Health Department Fees, or other such requirements.

## **'11. Protection of Work, Property, Employees and Public**

**'11.1 Safety Precautions and Programs.** The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Project. The Contractor shall be responsible for compliance with all State and Federal OSHA rules and regulations.

**'11.2 Safety of Persons and Property.** The Contractor shall continuously maintain adequate protection of all Work from damage and shall protect the Owner's property from injury or loss arising in connection with this Contract. He shall make good any such damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by agents or employees of the Owner. He shall adequately protect adjacent property as provided by law and the Contract Documents.

**'11.2.1 The Contractor shall take all necessary precautions** for the safety of his employees and the employees of his subcontractors on the Work site, and shall comply with all applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed.

**'11.2.2 The Contractor shall provide and maintain a Work environment** and procedures which will safeguard the public and State personnel and agents, property, material, supplies and equipment exposed to Contractor operations and activities; avoid interruptions of user agency operations; and avoid delays in Contract completion dates.

**'11.2.2.1 Utilities which serve occupied building(s) shall not be interrupted unless absolutely necessary.** When temporary utility interruptions are necessary, the Contractor shall provide the A-E and Owner a notice seven (7) calendar days prior to the temporary interruption. Where it is not practical to provide a seven (7) calendar day notice, the Contractor shall notify the A-E and Owner of the temporary interruption in advance and confirm the actual utility outage/ interruption a MINIMUM of seventy-two (72) hours ahead of the outage/ interruption.

**'11.2.2.2 When utilities are accidentally interrupted that serve occupied building(s),** the Contractor shall immediately notify the A-E, the Owner and the Building Operations Representative, and work consistently and persistently to restore the utilities immediately. The Contractor will be responsible for any costs or damages incurred by the Owner or adjacent property owners in the event of an accidental interruption.

**'11.2.3 For the purposes of protecting the safety of persons and property,** the Contractor shall provide appropriate safety barricades, signs and signal lights; Comply with any safety requirement published by any governmental authority with jurisdiction over the

site, including Federal, State or local jurisdictions; and ensure that any additional measures which are reasonably necessary for these purposes are taken.

**'11.2.4 The Contractor shall designate a responsible member** of his organization present on the Work site as safety officer whose duty shall be to enforce safety regulations. The name and position of the person so designated shall be reported to the A-E by the Contractor at the beginning of the project. Should the Contractor have reason to change the responsible member designated with this task, he shall immediately inform the A-E in writing.

**'11.2.5 In an emergency affecting the safety** of life, or of the Work, or of adjoining property, the Contractor, without special instruction or authorization from the A-E or Owner, shall act at his discretion to prevent such threatened loss or injury. Immediately following the emergency, the Contractor shall file a written report to the A-E and Owner detailing the incident and the actions taken to mitigate the condition.

**'11.2.6 If the A-E or the Owner becomes aware of any noncompliance** by the Contractor with the safety conditions of this Contract or of any condition caused by the Contractor, which poses a serious or imminent danger to the health or safety of the public or to State personnel, they shall notify the Contractor orally, with written confirmation, and direct immediate initiation of corrective action.

**'11.2.6.1 This provision of providing notice to Contractor** for noncompliance with safety issues does not in any way relieve the Contractor from his responsibilities, either in part or in full, to provide adequate precautions to insure the safety of persons and property.

**'11.2.6.2 This Notice**, when given to the Contractor or his representative at the Work site, shall be deemed sufficient notice of noncompliance and that corrective action is required.

**'11.2.6.3 After receiving the Notice**, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the A-E may issue an order stopping all or part of the Work until satisfactory corrective action has been taken.

**'11.2.6.3.1 The Contractor shall not be entitled** to an equitable adjustment of the Contract price or an extension of the performance schedule by reason of the issuance of any stop Work order under this Article.

**'11.3 Hazardous Materials.** In the event the Contractor unexpectedly encounters on the site material reasonably believed to be asbestos, lead based paint, polychlorinated biphenyl (PCB) or other classified hazardous substances/materials which have not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and A-E in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos, lead based paint, polychlorinated biphenyl (PCB), or other classified hazardous substances/materials which have not been rendered harmless. The Work in the affected area shall be resumed in the absence of any classified hazardous substances/materials or when it or they have been rendered harmless.

**'11.3.1 The Contractor shall at all times safely guard the Owner's property and adjacent property from injury and/or loss** resulting from the release of hazardous or toxic materials, or similar damage in connection with the Contract Documents or the performance of the Work hereunder. The Contractor shall replace or make good any damage, loss or injury caused as a result of failure to comply with Contract Documents.



**'12. Inspection of Work / Defective or Incomplete Work / Special Inspections**

The Owner, the A-E, Special Inspector Agency and their representatives shall at all times have access to the Work whenever it is in preparation or progress and the Contractor shall provide proper facilities for such access and for inspection. This access shall include access to approved Construction Documents and Submittals. The Contractor shall be given timely notification in order to arrange for proper inspection of any Work performed outside of the normal working day or week.

**'12.1 If the specifications, the A-E's instructions, laws, ordinances, or any public authority require any Work to be specially tested or approved,** the Contractor shall give the A-E timely notice of its readiness for inspection. Inspections by the A-E shall be made promptly, as defined by the Contract between the Owner and the A-E.

**'12.2 In the event that the Contractor covers, conceals or obscures its Work in violation of the Contract** or in violation of a directive from the Owner or the A-E, such Work shall be uncovered and displayed for the Owner's or A-E's inspection upon request, and shall be reworked at no cost in time or money to the Owner.

**'12.2.1 If any of the Work is covered, concealed or obscured in a manner not covered by the above paragraph,** it shall, if directed by the Owner or the A-E be uncovered and displayed for the Owner's or A-E's inspection. If the uncovered Work conforms strictly to the Contract, the costs incurred by the Contractor to uncover and subsequently, replace such Work shall be borne by the Owner. Otherwise, such costs shall be borne by the Contractor.

**'12.3 The Contractor shall, at no cost in time or money to the Owner,** correct Work rejected by the Owner or by the A-E as defective or failing to conform to the Contract. Additionally, the Contractor shall reimburse the Owner for all testing, inspections and other expenses incurred as a result thereof.

**'12.4 The Owner may, but shall in no event be required to, choose to accept defective or nonconforming Work.** In such event, the Contract Price shall be reduced by the greater of (1) the reasonable costs of removing and correcting the defective or nonconforming Work, and (2) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Contract Sum, if any, is insufficient to compensate the Owner for the acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the Owner, pay the Owner such remaining compensation for accepting defective or nonconforming Work.

**'12.5 When Special Inspections are required** by Section 1704 of the Kentucky Building Code for any portion of the work, the following provisions shall apply:

**'12.5.1 Special Inspector Agency or Special Inspector:** An independent agency/registered professional Contracted by the Owner, required by the Kentucky Building Code Chapter 17, and responsible for conducting special inspections and testing defined as such in the technical specifications for this project.

**'12.5.1.1 The costs of the initial special inspections and testing** shall be borne by the Owner by separate contract with the Special Inspection Firm.

**'12.5.1.2 The costs of re-inspections and/or re-testing, should discrepancies be found,** shall be paid by the Owner, but is recoverable by the Owner from the Contractor by a credit change order.

**'12.5.1.3 The costs of re-scheduling inspections and/or testing**, where the Contractor through his lack of reasonable control of scheduling causes the Special Inspector to spend time in preparation for an inspection and/or test that did not occur as scheduled, shall be paid by the Owner, but is recoverable by the Owner from the Contractor by a credit change order.

**'12.5.2 Contract Document Compliance:** Special Inspection and testing as defined in the technical specifications is for the purpose of verifying compliance with requirements specified or indicated. This does not relieve the Contractor of the responsibility for compliance with the Contract Document requirements.

**'12.5.2.1 Should the Special Inspector identify through inspection and testing that a portion of the Work is not in compliance with the technical specifications**, the Special inspector is to provide notice to the A-, Owner and Contractor concurrently that a deviation exists. The Special Inspection Firm does not possess the authority to modify the requirements of the technical specifications, but to inspect, test and notify of any non-compliance or deficiencies.

**'12.5.2.2 When a non-compliance or deficiency exists** as reported by the Special Inspection Firm, the A-E is to review the Special Inspection Report and, when necessary, issue a "Defective Work in Place Notice" to the contractor to require correction or modification.

**'12.5.2.3 Should the Special Inspector consider that there are a potential issue with the requirements of the technical specifications due to discovered existing field conditions**, the Special Inspector is to include such consideration in the Special Inspection Report for review and interpretation by the A-E. The decision of the A-E is final.

**'12.5.3 Notify the Special Inspector:** The Contractor shall be responsible for notifying the Special Inspector and/or Special Inspection Agency regarding individual inspections required by the Contract Documents and coordinating the schedule of inspections and testing with the Contractor's approved construction schedule. Adequate notice shall be provided so that the Special Inspector has time to become familiar with the project.

**'12.5.4 Deficiencies:** The Contractor shall be responsible to ensure that deficiencies are corrected and shall coordinate with the Special Inspector to ensure that the Special Inspector has observed the corrected deficiency prior to the work involved in the discrepancy being concealed or made inaccessible by subsequent work. Concealing or making inaccessible such deficiencies shall constitute another deficiency subject to removal to allow observation of the work involved in the initial discrepancy.

**'12.5.5 Reporting Requirements:** The Special Inspection Agency/ Special Inspector shall keep records of all inspections and testing, re-inspections and re-testing, and other related events. The Special Inspector shall furnish inspection and testing reports to the Owner, Contractor, and A-Eing concurrently and as construction progresses. Reports shall be submitted immediately following each site visit, inspection and when determinations of results of off-site testing are available.

**'12.5.5.1 Reports shall include** date of issue; project title and number; name/ address/ telephone number of testing agency; dates and locations of samples and tests or inspections; names of individuals making tests and inspections; description of the work being tested or inspected; test and inspection method; specification section related to work; complete test or inspection data; test and inspection results; interpretation of results; all non-conforming items/ discrepancies observed and corrective actions implemented by the Contractor; re-testing and re-inspection



performed; ambient conditions at time of sampling, testing or inspection; comments or professional opinion on whether tested or inspected work complies with the Contract Documents and name/ signature of inspector with registration number.

**'12.5.6 Notification of non-conforming or deficiency of the Work:** The Special Inspection Firm/ Special Inspector shall immediately bring non-conforming or discrepancy work to the attention of the Owner, A-E and Contractor. The A-E shall make a determination as to the need for correction.

**'12.5.6.1 If non-conforming or deficiency work is** not corrected in a timely manner or are about to be incorporated into the Work, the Special Inspector shall bring the non-conforming or discrepancy work to the immediate attention of the Authority Having Jurisdiction, Owner, Contractor, and the A-E, and that item shall be highlighted in the Special Inspector's written report.

**'12.5.6.2 Defective Work in Place Notice:** The A-E is to review the Special Inspector's report and when necessary shall issue a "Defective Work in Place Notice" and issue it through the Document Collaboration System. The Special Inspector shall cause the Notice to be posted at the Project Site regarding the noted discrepancies and which shall contain, at a minimum, the following information about the non-conforming item: 1) Description and exact location; 2) Reference to applicable detail of the approved Construction Documents (Drawings and Specifications); 3) name and title of each individual notified and method of notification; and, 4) Resolution or corrective action taken or to be taken.

### **'13. Royalties and Patents**

The Contractor shall pay all royalties and license fees and shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof.

### **'14. Changes in the Work/ Change Orders**

**'14.1 Change Orders.** One or more changes to the Work within the general scope of the Contract may be ordered by Change Order. The Contractor shall proceed with any such changes, (including additions, reductions, deletions, other revisions), and same shall be accomplished in strict accordance with the following:

**'14.1.1 Change Order means a written order to the Contractor** executed by the Owner and the A-E after execution of the Contract, directing a change in the Work and may include a change in the Contract Price, or the Contract Time, or any combination thereof. There shall be no authorized changes in the Work which affect either Contract Price or Contract Time without a fully executed Change Order.

**'14.1.1.1 In specific instances where the progress of the Work would be negatively affected** by a delay in the Work while a fully executed Change Order is being processed.. Upon approval by the Associate Director of the Division of Engineering, and with an agreed to Contract Sum/Contract Time adjustment, the A-E may issue a written authorization to proceed with the proposed change (with the change in Contract Sum/ Contract Time clearly indicated) prior to the issuance and execution of the formal Change Order. Following this written authorization to proceed with the proposed change, the A-E will prepare and process for execution the required Change Order.

**'14.1.1.2 In these specific instances where a written authorization to proceed is provided prior to execution of the required Change Order**, the action of the Contractor to proceed with the authorized work shall be deemed as agreement to the change for the Amount and Time extension indicated in the written notice to proceed with the change.

**'14.1.2 Any change in the Contract Sum or Contract Time resulting from a Change Order shall be determined by one of the following methods:**

- (1) **by mutual agreement of a lump sum amount** and/or Time adjustment between the Owner and the Contractor as evidenced by (a) the Change in the Contract Sum or Contract Time being set forth in the Change Order, (b) such change in the Contract Sum or Contract Time, together with any conditions or requirements relating thereto, being initialed by both parties and (c) the Contractor's execution of the Change Order;
- (2) **by unit prices stated in the Contract Documents** or subsequently agreed upon by the Owner and the Contractor
- (3) **on a time and materials basis with a not to exceed price limitation**, when the scope of the Work is not readily determined prior to the execution of the Work. Prior to the use of a time and materials basis, approval of the Associate Director of the Division of Engineering is required. Additionally, the Contractor must provide detailed labor and materials documentation of the Work once performed for the reconciliation of the time and materials basis cost of the work. The A-E shall monitor the Work performed by this basis during the execution of the work; or
- (4) **If no mutual agreement occurs** between the Owner and the Contractor, the Change in the Contract Sum, if any, shall be derived by determining the reasonable actual costs or savings achieved resulting from revisions in the Work. This determination shall be made by the A-E, who has the responsibility of interpretation of the Contract Documents.

**'14.1.2(4).1 When a determination by the A-E is required for a Change Order** due to no mutual agreement being reached between the Owner and the Contractor, the provisions of paragraph '14.1.3 and '14.1.4 shall apply. Additionally, the Contractor shall not refuse to perform the Work indicated by the Change Order and shall execute the Work in a timely manner, even if the Contractor intends to protest the determination as provided in paragraph '3.4

**'14.1.3 Items (1), (3), and (4) above shall include a component for all overhead, profit, indirect costs or other items not to exceed fifteen percent (15%).** Any such costs or savings shall be documented in the format and with such content and detail as the Owner or the A-E requires. The Contractor shall only receive one fifteen percent (15%) for the "jobsite overhead and profit" component whether such work be done by the Contractor or by his Subcontractor.

**'14.1.3.1 Contractor's Overhead and Profit percentages** shall be considered to include bonds and insurance, field and office supervisors and assistants (including Project Manager(s), Job Site Superintendent(s), Project Engineers and assistants, and Crew Foremen), Job Office and storage Trailers, sanitary facilities, communications (telephone and internet), temporary utilities, temporary facilities, testing, security, use of small tools, incidental job burdens, and general home office expenses and no separate allowance shall be made therefore.

**'14.1.3.2 Assistants to field and office supervisors include all clerical, stenographic and general office help.** Incidental job burdens include, but are not

necessarily limited to, office equipment and supplies, and conformance to OSHA requirements and no separate allowance shall be made therefore.

**'14.1.3.3** Items such as, but not necessarily limited to, review and coordination, estimating and expediting relative to contract changes are associated with field and office supervision and are considered to be included in the contractor's overhead and/or fee percentage.

**'14.1.4 For all charges relating to any Change Order, whether determined under subparagraph (2), (3) or (4) above, the following provisions shall apply:**

- (1) **The Contractor shall keep and present in such form as the A-E may direct, a correct account of all items in such form comprising the net cost of such Work, together with vouchers.**
- (2) **The determination of the A-E shall be final (except as provided in paragraph '3.4) upon all questions of the amount and cost of Changes in the Work, and it shall include in such cost, the cost to the Contractor of all materials used, of all labor, common and skilled, or foremen, trucks and teams, and the fair rental of all machinery used and for the period of such use.**
- (3) **If said Work requires the use of machinery not already upon the work or to be otherwise used upon the Work, then the cost of transportation of such machinery to and from the Work shall be added to the fair rental, but said transportation shall not cover a distance exceeding one hundred (100) miles.**
- (4) **The A-E shall not include in the net cost of Work any cost or rental or small tools, or any portion of time of the Contractor or his Superintendent, or any allowance for the use of capital, or any additional bond premium, insurance cost applicable to the Work or any actual or anticipated profit, or any job or office overhead not previously mentioned, these items being considered as being covered by the added fifteen (15%) percent for the jobsite overhead and profit component.**
- (5) **In all cases where Changes in the Work are covered by unit prices set forth in the Contract, the value of such Work shall be determined only upon the basis of such unit prices.**
- (6) **Pending final determination of value, payments on Changes in Work shall be made only upon the estimate of the A-E.**

**'14.1.5 If the Contractor claims that any instructions by the A-E involve additional cost and/or time extension, he shall give the A-E written notice thereof within a reasonable time after the receipt of such instructions and before proceeding to execute the change in Work.**

**'14.1.6 No work related to a Change Order shall be undertaken without a fully executed Change Order.** However, should the Owner and Contractor agree that time is of the essence for the execution of said work, the Owner will issue through the A-E in writing a notice to proceed with the said work prior to the full execution of the Change Order. This notice is to be upon acceptance by the Associate Director of the Division of Engineering. This notice to proceed with said work will include an acceptance of the proposed pricing of the work or will indicate that the pricing of the work is still being negotiated.

**'14.1.7 If the Owner and Contractor cannot agree on the effect of an ordered change on the adjustment to the Contract Sum or Contract Time,** this matter may also be referred to the A-E for determination.

**'14.1.7.1 If the Owner and/or Contractor do not agree with the A-E's determination regarding the valuation of a change,** the related adjustment to the Contract Sum or to the Contract Time, the matter shall be subject to the disputes procedure set out in Article 3.4 and Article 26.

**'14.1.8 The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, the resulting Contract as thus amended, the Contract Sum and the Contract Time for performance by the Contractor.** The Contractor, by executing the Change Order, waives and forever releases any claim against the Owner for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order.

**'14.1.9 The Contractor shall notify and obtain the consent and approval of the Contractor's Payment and Performance Bond sureties with reference to all Change Orders** if such notice, consent or approval are required by the Owner, the A-E, the Contractor's sureties or by law. The Contractor's execution of the Change Order shall constitute the Contractor's warranty to the Owner that the sureties have been notified of, and consent to, such Change Order and the sureties shall be conclusively deemed to have been notified of such Change Order and to have expressly consented thereto.

**'14.2 Cash Allowance:** It is understood that the Contractor has included in the Contract Price all allowances (see Article '30 for more information) so named in the Contract Documents and shall cause the Work so covered to be furnished and performed for such sums as may be acceptable to A-E and the Owner. The Contractor agrees that:

**'14.2.1 The allowances include the cost to Contractor** (less any applicable trade in counts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

**'14.2.2 The Contractor's cost for** unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances and no demand for additional payment on account of any of the foregoing will be valid; and

**'14.2.3 Prior to final payment of the full amount of the allowance** (on the schedule of values), an appropriate Change Order will be issued as recommended by A-E reflect actual amounts due the Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

**'14.3 Minor Changes.** The A-E may authorize minor changes in the Work which do not involve additional cost or extension of the Contract Time, and which are not inconsistent with the intent of the Contract Documents. Such changes shall be effected by a Field Order issued by the A-E to the Contractor and Owner concurrently, which shall be binding on the Owner and Contractor. The Contractor shall carry out such orders promptly.

**'14.3.1 However, if the Contractor claims that a Field Order involves additional cost or a delay to completion of the Work,** he shall give the A-E written notice thereof within a reasonable time after receipt of the Field Order. Otherwise, he shall be deemed to have waived any right to claim an adjustment to the Contract Sum or to the Contract Time.

## **'15 Project Records**

**'15.1 All documents relating in any manner whatsoever to the Project**, or any designated portion thereof, which are in the possession of the Contractor, or any Subcontractor of the Contractor, shall be made available to the Owner or the A-E for inspection and copying upon written request by the Owner.

Furthermore, said documents shall be made available, upon request by the Owner, to any state, federal or other regulatory authority and any such authority may review, inspect and copy such records.

Said records include, but are not limited to all drawings, plans, specifications, submittals, correspondence, minutes, memoranda, tape recordings, videos, or other writings or things which document the Project, its design, and its construction.

Said records expressly include those documents reflecting the cost of construction to the Contractor.

**'15.2** The Contractor shall maintain and protect these documents for no less than ten (10) years after final completion of the Project, or for any longer period of time as may be required by law or good construction practice.

## **'16. Delays and Extensions of Time**

**'16.1 It is agreed that time is of the essence for each and every portion of the resulting Contract** and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall be of the essence of the Contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to:

- (1) any preference, priority, or allocation order duly issued by the government;
- (2) unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather; or
- (3) any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsections (1) and (2) of this Article.

**16.1.1 Delay that is NOT caused by the Owner or Contractor**, that delays the critical path of the project schedule, may result in extension of Contract Time but not an increase in Contract Sum. Such delay includes: Acts of God; Labor disputes/ Strikes; Freight embargoes; Fire (when not attributable to act of Contractor); Unusual delays in deliveries (when not attributable to act of Contractor); Health epidemics that affect Contractor forces; and, Other causes beyond the control of the Contractor or Owner. Note: an increase of time caused by a delay that is NOT caused by the Owner or Contractor, does not constitute reason for an increase in Contract Sum.

**'16.1.1.1 The Contractor shall, within fifteen (15) calendar days of the occurrence** of the event that caused a delay not caused by the Owner or Contractor, notify the A-E and Owner in writing. The A-E shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order. Such a claim shall not result in an increase in Contract Sum.

**'16.1.1.1.1 Should the Contractor NOT provide written notification to the A-E and Owner** within the prescribed period of time indicated above, the Contractor, by his failure to properly notify, forfeits the right to seek a Contract Time Extension for said occurrence.

**'16.1.1.2 Should the Owner determine that it is in the Owner's best interest to avoid an extension of Contract time** due to a delay not caused by the Owner or Contractor, the Owner, through the A-E, may request the Contractor to provide a plan of action to mitigate the delay through changes in the sequence of operations or through an extended workday for specific trades that will mitigate the delay. In such instances, the Owner may elect to pay the Contractor reasonable and justified additional costs required to mitigate the delay in lieu of a contract time extension. This additional costs shall be limited to the overtime premium of the extended workday for specific trades or shall be limited to actual and proven costs of a change in sequence of operations.

**16.1.2 Delay due to adverse weather conditions:** The Contractor shall have incorporated into the Project Schedule at the time of execution of the Contract for Construction all anticipated delay caused by normally occurring adverse weather. Adverse weather is that which normally occurring (as defined as the average of the preceding ten (10) years) according to the records of the National Oceanic Atmospheric Administration (NOAA).

**'16.1.2.1 When adverse weather exceeds** that which is normally expected, as defined above, and the Contractor is making a claim for delay due to adverse weather, the Contractor shall submit to the A-E and Owner the following at the Project Progress Meeting immediately following the month in which the excessive adverse weather occurred:

- 1) Current weather data from NOAA for the project site which documents and proves that the adverse weather occurred at the project site on days in which work was scheduled to occur.
- 2) Historical weather data from NOAA for the project site which documents and proves that the adverse weather that occurred at the project site was more than anticipated.
- 3) Contractor's daily field reports showing that the adverse weather that was experienced at the project site caused delay in the work that was scheduled to be performed on during the period in which adverse weather was experienced.
- 4) Contractor's written detailed explanation of the delay in the work and how it was caused by the abnormal adverse weather that was experienced at the project site and was beyond the ability of the Contractor to control or mitigate the delay for each occurrence.

**'16.1.2.1.1 Should the Contractor NOT provide the information indicated above to the A-E and Owner,** within the prescribed period of time indicated above, the Contractor, by his failure to properly notify, forfeits the right to seek a Contract Time Extension for said occurrence.

**'16.1.2.1.2 When the Contractor is behind the critical path of the schedule,** it shall be the determination of the A-E as to whether the Contractor should be eligible for a time extension due to adverse weather delay. In making this determination, the A-E shall determine and conclude that the Contractor would have been delayed by adverse weather had the Contractor been on schedule of the critical path before determining that the Contractor is eligible for a time extension due to adverse weather delay. The Contractor shall provide evidence to the A-E for the A-E's use in making such determination.



**'16.1.2.2 When adverse weather is significantly less** than that which is normally expected, as defined above, the A-E will prepare for the Owner, at its request, a claim for a reduction in Contract Time by providing current and historical weather data from NOAA for the project site which documents and proves that the adverse weather was less than anticipated at the Project Progress Meeting immediately following the month in which the adverse weather that occurred was significantly less than anticipated. The number of days in the claim shall be added to the project float and is made available to the Contractor and/or Owner to mitigate other types of delay in the project completion. Generally, a reduction of time caused by less than anticipated adverse weather does not constitute reason for a decrease in Contract Sum.

**16.1.2.3 When the A-E determines that adverse weather has delayed** the project and that the claim of the Contractor for delay due to adverse weather is justified, the Contractor will provide an accounting of float held in the project (see Article 16.2.1.4.1) that may be applied to the weather delay. Should the amount of weather delay exceed the available amount of float held on the project, the A-E will issue a Change Order extending the Contract Time by the number of days in which the Contractor was actually delayed due to adverse weather. Generally, an extension of time for delays caused by adverse weather does not constitute reason for an increase in Contract Sum.

**'16.1.2.3.1 Should the Owner determine that it is in the Owner's best interest to avoid an extension of Contract time** due to a delay caused by adverse weather, the Owner, through the A-E, may request the Contractor to provide a plan of action to mitigate the delay through changes in the sequence of operations or through an extended workday for specific trades that will mitigate the delay. In such instances, the Owner may elect to pay the Contractor reasonable and justified additional costs required to mitigate the delay in lieu of a contract time extension. This additional costs shall be limited to the overtime premium of the extended workday for specific trades or shall be limited to actual and proven costs of a change in sequence of operations.

**'16.2.1 Delay that is caused by the Owner**, that delays the critical path of the project schedule, may result in extension of Contract Time and may result in an increase in Contract Sum. Generally, delays of this type which do not delay the critical path of the project schedule shall not result in extension of Contract Time nor result in an increase in Contract Sum.

**'16.2.1.1** The Contractor shall, within seven (7) calendar days of the occurrence of the event, notify the A-E in writing. The A-E shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

**'16.2.1.1.1 Should the Contractor NOT provide the information indicated above to the A-E and Owner**, within the prescribed period of time indicated above, the Contractor, by his failure to properly notify, forfeits the right to seek a Contract Time Extension for said occurrence.

**'16.2.1.2 An extension of time shall not be construed as cause for extra compensation under the Contract.** Extensions of time relating to concealed conditions as defined in Article 26 shall be governed by the provisions of that Article.

**'16.2.1.3 Should the Contractor claim that an extension of time is cause for extra compensation under the Contract**, he shall make such claim in writing to the A-E within fifteen (15) calendar days of the occurrence of the event. This claim shall be in sufficient detail to support the Contractor's claim. In instances where the final determination of the costs associated with such delay is not readily calculable, the Contractor shall provide an ESTIMATED cost of the delay per day of delay. If this estimated cost of delay per day is

accepted by the Owner, the actual amount compensable by the delay will be based on this estimate.

**16.2.1.3.1 A Contractor's claim for extra compensation under the Contract may include:** Job Office expenses (for a delay in excess of sixteen (16) calendar days in any given month / each month considered separately), extended equipment-left-idle costs (rented or owned), increased labor and material costs (for extended delays), loss of efficiency (for extended delays), increased insurance premiums, excess storage costs, etc.

**16.2.1.3.2 A Contractor's claim for extra compensation under the Contract shall not include:** home office costs, equipment-not-left-idle costs (rented or owned), increased labor or material costs (for short delays), job site forces costs, loss of efficiency (for short delays), etc.

**16.2.1.4 When the Contractor experiences a delay caused by the Owner,** the Contractor shall work to mitigate the delay to be best of his ability and to make a claim for the delay must prove that he mitigated the delay to the greatest extent possible.

**16.2.1.4.1 Since the Owner and Contractor share as a commodity, all float (including Total Float, Free Float and Sequestered Float) (See Article '4.2),** this float is available to the Owner to mitigate the effect of events that may delay performance or completion of all or part of the Work that has been caused by the Owner.

**16.2.1.5 When the Contractor experiences a delay caused by the Owner,** the delay must result in a delay to the critical path of the project schedule which is not readily recoverable by the Contractor without actual damage. In making a claim for the delay the Contractor must prove that the delay was a delay to the critical path of the project schedule and that he was not readily able to recover without actual damage.

**16.2.1.6 When the Contractor experiences a delay caused by the Owner,** the Contractor may not be entitled to a claim for the delay if a concurrent delay is present that is caused by the actions or inaction of the Contractor. When a concurrent Contractor caused delay exists, both delays shall be reviewed together and the Contractor is only eligible to make a claim for a delay caused by the Owner that extends beyond the concurrent delay caused by the Contractor.

**16.2.1.7 When there is a delay caused by the Contractor that is concurrent with a delay caused by the Owner,** there may be an extension of Contract Time, if found warranted, but no compensation to the Contractor will be made.

**16.2.1.8 When the Contractor is behind the accepted Project Schedule (related to the Critical Path),** and there occurs a delay caused by the Owner (that would have affected the Critical Path had the Contractor been on schedule), no time extension or compensation will be due the Contractor during the period of time that he is behind schedule.

**16.2.1.9 When the Contractor fails to plan his work in a manner than permits him to ask questions of the A-E/Owner reasonable ahead of the time he requires to the answer to avoid a delay caused by the Owner,** the delay will be considered a concurrent delay and while an extension of time may be found as reasonable to grant the Contractor, no compensation for the delay will be provided. This situation is considered a concurrent delay since the Contractor participated in creation of the delay by his failure to plan the work adequately to avoid or reduce the delay.



**'17 Subcontractors**

**'17.1 Contractor Fully Responsible for Subcontractors.** The Contractor is fully responsible to the Owner for the acts and omissions of his Subcontractors and of persons and entities either directly or indirectly employed by them. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner and a Subcontractor.

**'17.1.1 The Contractor has the contractual obligation to adjust differences** between his several Subcontractors. Attempts to have the A-E and/or Owner settle disputes between the Contractor and his Subcontractors or between Subcontractors will not be given consideration.

**'17.1.2 The Contractor shall not submit any claim from a Subcontractor** to the A-E and/or Owner. Should the Contractor receive a claim from a Subcontractor, it is his obligation to satisfy the claim with his subcontractor. Should the Contractor determine that a claim from a Subcontractor is valid and should be considered by the A-E and/or Owner, the Contractor shall make the claim as himself with the subcontractor's claim as supporting documentation. The Contractor shall also provide documentation and reason for supporting the claim to the A-E and/or Owner.

**'17.1.2.1 The A-E and/or Owner have no responsibility or obligation** to meet with a subcontractor to resolve a dispute or claim. Should the Contractor desire to have a subcontractor accompany the Contractor in a meeting to resolve a dispute or claim, a request shall be made prior to the meeting requesting the Owner's acceptance of such accompaniment. Granting of this acceptance shall be solely at the discretion of the Owner and does not establish any contractual relationship of the Owner with the subcontractor in any respects.

**'17.1.3 The Contractor is responsible for the performance of his several subcontractors** including, but not necessarily limited to: any delay in completion of the work of a subcontractor; sequencing of work among his several subcontractors; covering up of work requiring inspection or observation; and/or the quality of workmanship in completing the Work.

**'17.1.4 The Contractor shall not submit to the A-E and/or Owner any document,** submittal, manual, or price proposal directly from his several Subcontractors without first having reviewed such and determined that it is reasonable, complete, and compliant with the Contract Documents.

**'17.2 Flow-down Requirement.** By contract, the Contractor shall require each Subcontractor:

- (1) to be bound to the Contractor by the terms of the Contract Documents insofar as they apply to the Work to be performed by the Subcontractor; and
- (2) to assume toward the Contractor all the obligations which the Contractor, by the Contract Documents, assumes toward the Owner.

**'17.3 Contracts with Subcontractors.** The Contractor shall contract with those Subcontractors listed in the Contractors Bid Response and deemed acceptable by the Owner in accordance with the procedure outlined in the Instruction to Bidders. All subcontracts shall afford the Contractor rights against the Subcontractor which correspond to those rights afforded to the Owner against the Contractor herein, including those rights of Contract termination as set forth herein.

**'17.4 Substitution of Subcontractors.** The Contractor shall not contract with any substitute Subcontractor or change a Subcontractor without providing timely written notice of the

proposed substitution to the A-E and Owner. The substitution shall not be made if the A-E and Owner object in writing to such change.

**17.4.1 Release required of original Subcontractor.** When the Contractor finds it necessary to propose a substitute Subcontractor or change a Subcontractor he shall provide to the Owner a written release from the Subcontractor being substituted or changed indicating that they are not able, or not willing to, provide the work in which they were originally contracted to provide.

**17.4.1.1 This written release shall be on the official letterhead of the Subcontractor,** when obtainable, stating that the Subcontractor is agreeable to being substituted on the project and that the Subcontractor waives all current and future claims resultant from the substitution.

**17.4.1.2 When the Contractor cannot obtain the release required of original Subcontractor** he shall provide in written form a statement, on the letterhead of the Contractor with proof that the Contractor has attempted to obtain such a release, that the Subcontractor is non-responsive in not only providing the release but is also non-responsive in providing the work being subcontracted, and that the Contractor fully accepts any future liability from the original subcontractor making a claim related to being substituted.

**17.4.1.3 Prior to the substitution being made,** the Contractor shall obtain written approval from the Purchasing Officer indicating that the Commonwealth has reviewed the documents provided as indicated above and has concluded that it is in the best interests of the Commonwealth that such a substitution is accepted.

## **'18. Payment**

The Owner shall make payments, less held retainage (defined in paragraph 18.5), to the Contractor on the amount of the Work performed or materials furnished for the Work in accordance with the following procedures:

**'18.1 Schedule of Values.** At the same time it submits a construction schedule, within fifteen (15) days of the Date of Commencement, as provided in Article 4, the Contractor shall submit a Schedule of Values apportioning the Contract Sum among the different elements of the Project for purposes of periodic and final payment, prepared in such form and supported by such data to substantiate its accuracy as the A-E may require. The Contractor shall not imbalance its Schedule of Values, nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of the Contract. Upon written approval by the A-E and the Owner, the Schedule of Values and construction schedule shall become the basis for the Contractor's Payment Requests during construction.

**'18.2 Application for Progress Payment.** Not more often than once a month (except as provided in paragraph 3.8), the Contractor shall submit to the A-E a signed application for payment (sometimes referred to as Payment Request), for the Work completed as of the date of the application and accompanied by such data and schedules as the A-E may reasonably require.

**'18.2.1 Therein, the Contractor may request payment less held retainage,** of that part of the Contract Sum allocable to Contract requirements properly provided, labor, materials and equipment properly incorporated in the Project.

**'18.2.2 If payment is requested on the basis of materials and equipment not incorporated in the Project,** but delivered and suitably stored at the Project site or at another location agreed to in writing by the Owner, the application for payments shall also

be accompanied by such data, satisfactory to Owner, as will establish the Owner's title to the material and equipment and protect his interest therein, including written documentation of full insurance against loss or damage and the bonding of the storage sites. Storage sites must be bonded.

**'18.2.3 Each subsequent application for payment** shall include an affidavit of the Contractor stating that all previous progress payments received on account of the Work have been applied to discharge in full all of the Contractor's obligations reflected in prior applications for payment.

**'18.2.4 Each Payment Request shall be signed by the Contractor** and shall constitute the Contractor's representation that the quantity of Work has reach the level for which payment is requested, that the Work has been properly installed or performed in strict compliance with this Contract, and that the Contractor knows of no reason why payment should not be made as requested.

**'18.3 Approval of Payments.** The A-E shall review the application for payment and shall review the work at the Project site or elsewhere to determine whether the quantity and quality of the Work is as represented in the application for payment and is as required by this Contract.

**'18.3.1 The A-E shall, within ten (10) business days** after receipt of each application for payment, approve in writing the amount which, in the opinion of the A-E, is properly owing to the Contractor.

**'18.3.1.1 When there is reasonable justification that causes the A-E to be unable to perform this review, approval and submission of his recommendation to the Owner within the time prescribed in paragraph 18.3.1 above,** the A-E will notify the Contractor in writing as to the justification and as to the time that will be required for this review, approval and submission of his recommendation to the Owner.

**'18.3.2 The Owner shall make payment to the Contractor within twenty (20) business days following the A-E's written approval** of each application for payment. A reasonable delay on the part of the Owner in making payment to the Contractor for any given payment shall not be a breach of contract.

**'18.3.2.1 When there is reasonable justification that causes the Owner to be unable to make payment within the time prescribed in paragraph 18.3.2 above,** the Owner will notify the Contractor in writing as to the justification as to why this payment cannot be made.

**'18.3.2.2 The Owner will not be required to make payment to the Contractor within the time prescribed in paragraph 18.3.2 above,** when the Owner has justification for the holding of this payment such as when the Owner's payment is conditional on submission of required documents from the Contractor.

**'18.3.3 The amount of each such payment shall be the amount approved for payment by the A-E less such amounts,** if any, otherwise owing by the Contractor to the Owner or which the Owner shall have the right to withhold as authorized by this Contract. The A-E's approval of the Contractor's application for payment shall not preclude the Owner from the exercise of any of its rights as set forth herein. The Contractor warrants and represents that, upon payment of the application for payment, title to all Work included in such payment shall be vested in the Owner.

**'18.4 Contractor's Warranty of Title.** The Contractor warrants and guarantees that title to all Work, materials and equipment covered by any application for payment, whether incorporated

in the project or not, will pass to Owner at the time of payment free and clear of all encumbrance.

**'18.5 Held Retainage/ Retainage Reduction.** Until fifty percent (50%) of the construction work has been completed in accordance with the contract, the Owner may withhold no more than ten percent (10%) retainage from the amount of any undisputed payment due, and retainage held after fifty-one percent (51%) of the construction project has been completed shall not be more than five percent (5%) of the total Contract Sum.

**'18.5.1 Subsequently, the Contractor shall withhold no more than ten percent (10%) retainage from the amount of any undisputed payment due to a subcontractor, and retainage held after fifty-one percent (51%) of the construction project has been completed shall not be more than five percent (5%) of the total amount contracted with a subcontractor.**

**'18.6 Completion, Acceptance and Final Payment.** Upon certification by the A-E of Substantial Completion of the Work, the Contractor shall continue to make normal pay requests as defined within this document.

**'18.6.1 Within thirty (30) calendar days after substantial completion or within twenty (20) calendar days after receipt of the A-E's recommendation for payment (whichever comes last), the Owner shall release the retainage less an amount equal to two hundred percent (200%) of the Owner's reasonably estimated cost of the balance of any contractor's contractually obligated, yet uncompleted, work remaining plus the following:**

**'18.6.1.1 Should the Contractor not fulfill the requirements for Substantial Completion by the date established by the Contract Documents for Substantial Completion, the Owner may withhold an additional amount of retainage to cover the anticipated application of "Liquidated Damages" or "Damages for Untimely Performance".**

**'18.6.2 Final payment shall be made by the Owner to the Contractor when the Contract has been fully performed by the Contractor in accordance with the Contract Documents and a final Certificate of Payment is submitted by the A-E to the Owner.** Such final payment shall be made by the Owner not more than twenty (20) calendar days after the submittal by the A-E of the final Certificate of Payment, except:

**'18.6.2.1** when the Owner is anticipating applying "Liquidated Damages" or "Damages for Untimely Performance", the amount of this anticipated application of damages may be withheld from Final Payment until such damages are resolved between the Owner and the Contractor.

**'18.6.3 The Contractor shall submit with the application for final payment** an affidavit that all payrolls, bills for materials, supplies and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied, along with such supporting evidence of payment as the A-E requires. Final payment is conditioned on satisfactory compliance with this requirement.

**'18.7 Waiver of Claims.** The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

**'18.7.1** unsettled liens;

**'18.7.2** faulty or defective Work appearing after Substantial Completion;

**'18.7.3** failure of the Work to comply with the requirements of the Contract Documents; or

**'18.7.4** terms of any special warranties required by the Contract Documents.

The acceptance of final payment by the Contractor shall constitute a waiver of all claims except those previously made in writing and identified by the Contractor as unsettled at the time of the final application for payment.

**'18.8 Contractor's Payment to Subcontractors.** Within fourteen (14) calendar days of when payment is received from the Owner, the Contractor shall pay all Subcontractors, materialmen, laborers and suppliers the amounts they are due for the Work covered by such payment.

**'18.8.1 In the event the Owner becomes informed that the Contractor has not paid a Subcontractor,** material-man, laborer, or supplier as provided herein, the Owner shall have the right, but not the duty, to issue future checks and payment to the Contractor of amounts otherwise due hereunder naming the Contractor and any such Subcontractor, material-man, laborer, or supplier as joint payees. Such joint check procedure, if employed by the Owner, shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to commit the Owner to repeat the procedure in the future.

**'18.8.2** The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payment to his subcontractors in similar manner.

**'18.8.3** The A-E or Owner may, on request, furnish to any Subcontractor information regarding the percentage of completion of the amounts applied for by the Contractor and the action thereon by the A-E.

**'18.8.4** Neither the Owner nor the A-E shall have any obligation to make payment to any Subcontractor except as may otherwise be required by law.

**'18.9 Owner's Rights Relating to Payments.** Neither payment to the Contractor, utilization of the project for any purpose by the Owner, nor any act or omission by the Owner shall be interpreted or construed as an acceptance of any Work of the Contractor not strictly in compliance with this Contract.

**'18.9.1 The Owner shall have the right to refuse to make payment** and, if necessary, may demand the return of a portion or all of the amount previously paid to the Contractor due to:

**'18.9.1.1** The quality of a portion, or all, of the Contractor's Work not being in accordance with the requirements of this Contract;

**'18.9.1.2** The quantity of the Contractor's Work not being as represented in the Contractor's Payment Request, or otherwise;

**'18.9.1.3** The Contractor's rate of progress being such that, in the Owner's opinion, substantial or final completion, or both, may be inexcusably delayed;

**'18.9.1.4** Claims made, or likely to be made, against the Owner;

**'18.9.1.5** Loss caused by the Contractor;

**'18.9.1.6** The Contractor's failure or refusal to perform any of its obligations to the Owner under this Contract.

In the event that the Owner makes written demand upon the Contractor for amounts previously paid by the Owner as contemplated in this Paragraph, the Contractor must promptly comply with such demand.

## **'19. Completion**

**'19.1 Commencement and Completion of Work.** The Contractor shall begin the Work on the Date of Commencement as specified in the Contract issued by the Owner.

**'19.1.1 The Contractor is expected to mobilize on site and begin work no later than fifteen (15) calendar days after the Date of Commencement,** unless he has notified the A-E and Owner in writing of acceptable reasons why it is not in the best interest of the Commonwealth and the Project that he will not mobilize by that date.

**'19.1.2 The Contractor shall diligently and expeditiously continue the performance** of the Contract continuously to and until Substantial Completion and Final Completion of the Project. All time limits stated in the Contract Documents are the essence of the Contract.

**'19.1.3 The Contractor shall accomplish the Work in accordance** with the construction schedule (as provided in Article 4) so as to achieve Substantial Completion and Final Completion dates as defined in the Contract Documents.

**'19.2 Date for Commencement of Commissioning.** Commissioning of specified building systems shall be scheduled to allow for the completion of the commissioning process by the Date of Substantial Completion. The Contractor shall work to complete the initial installation and startup of equipment involved in these building systems early enough in the project that the complete and properly conducted commissioning process can be completed including any corrective work and verification identified by the commissioning process. (See the associated sections of the technical specifications for the commissioning requirements and procedures for each building system which is to be commissioned).

**'19.3 Date for Commencement of Testing and Balancing.** Testing and Balancing of HVAC systems shall be scheduled to allow for the completion of the Testing and Balancing process by the Date of Substantial Completion. The Contractor shall work to complete the initial installation and startup of HVAC equipment early enough in the project that the complete and properly conducted testing and balancing process can be completed including any corrective work and verification identified by the testing and balancing process.

**'19.4 Substantial Completion of the Work.** The Substantial Completion Date shall be that date certified by the A-E, in consultation with the Owner, in accordance with the following procedures.

**'19.4.1 "Substantial Completion"** or "Substantially Complete" means the point in time when:

**'19.4.1.1 The progress of the Work,** or designated portion of the Work (as agreed in writing advance by the Owner, A-E and Contractor), is fully complete and functional in accordance with the requirements of the Contract Documents such that only items listed in the Punch list remain and the Work, or designated portion thereof, is ready to be occupied and/or utilized for its intended purpose;

**'19.4.1.2 The applicable Governmental Authorities** have issued a certificate of occupancy (or where Substantial Completion only applies to a designated portion of the Work, a temporary certificate of occupancy) and/or any other applicable approvals, licenses, certifications or other written evidence from the applicable Governmental Authority that said Work, or designated portion of the Work, has been completed to such authority's satisfaction and is ready to be occupied and/or used for its intended purpose.

**'19.4.1.2.1 Where the project requires specialized Governmental Authorities to inspect and accept the construction (i.e. Office of Inspector General, Federal Agencies, etc.)** a determination is to be made in the 'Special Conditions' of this Contract as to the timing of these



inspections or acceptances and how they affect the Date of Substantial Completion, Date of Final Completion or an Extended Date for Compliance for that specific inspection or acceptance requirement.

**'19.4.1.3 The A-E has issued an Owner approved certificate of Substantial Completion for the Work,** or designated portion of the Work, in accordance with the terms of the Contract Documents;

**'19.4.1.4 Operations and Maintenance Manuals,** have been received for review by the A-E and the A-E has determined that the Operations and Maintenance Manuals are complete.

**'19.4.1.4.1** Note that the Contractor shall submit Operations and Maintenance Manuals prior to the anticipated Date of Substantial Completion in order to allow the A-E reasonable time to review and approve or reject the submittal.

**'19.4.1.4.2** The A-E shall review and approve or reject the Operations and Maintenance Manuals within fourteen (14) calendar days of receipt from the Contractor. The Date of Substantial Completion shall not be earlier than the date of approval of the Operations and Maintenance Manuals by the A-E.

**'19.4.1.5 Warranty Samples,** have been reviewed and approved by the A-E.

**'19.4.1.5.1** Note that the Contractor shall submit samples of each required Warranty prior to the anticipated Date of Substantial Completion in order to allow the A-E reasonable time to review and approve or reject the submittal.

**'19.4.1.5.2** The A-E shall review and approve or reject the sample Warranties within fourteen (14) calendar days of receipt from the Contractor. The Date of Substantial Completion shall not be earlier than the date of approval of the samples of Warranties by the A-E.

**'19.4.1.6** With respect to all of the Project's building systems, including, without limitation, all systems being Commissioned, the Work, or designated portion of the Work (as agreed in writing in advance by the Owner, A-E and Contractor), is fully commissioned, balanced, tested and operational in compliance with the Contract Documents and applicable Laws ("Systems Commissioning"); The Date of Substantial Completion shall not be earlier than the date in which Systems Commissioning is completed.

**'19.4.1.7** All required initial and follow-up orientation and training has been accomplished in accordance with the requirements of the Contract Documents ("Systems Training"). The Date of Substantial Completion shall be no earlier than the date in which the final training session has been satisfactorily completed.

**'19.4.1.8** The Contractor shall have advised the Owner of insurance requirements including a list of all fixed and non-fixed equipment provided under the Work including replacement values for each item of equipment.

**'19.4.2** When the Contractor determines that Substantial Completion has been achieved, the Contractor shall notify the Owner and the A-E in writing. The notification shall be accompanied by a Contractor prepared list of those items of Work still to be completed or corrected. The failure of the Contractor to include any item or items on such list not completed or needing correction shall not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

**'19.4.3 The A-E shall**, within a reasonable time after receipt of notification from the Contractor of Substantial Completion, make such inspection, with consultation of the Owner, to confirm that the Work has achieved Substantial Completion. If the Contractor's notification is not accompanied by the list provided in paragraph '19.2.1, the A-E and Owner may elect to postpone this inspection until receipt of the list proscribed.

**'19.4.4 Upon its confirmation** that the Contractor's work is substantially complete, the A-E shall prepare a Certificate of Substantial Completion which shall establish the Substantial Completion Date and the responsibilities between the Owner and Contractor for security, maintenance, heat, utilities and insurance, if not otherwise provided for in the Contract Documents, and a tentative list of items to be completed or corrected, within thirty (30) calendar days from the Substantial Completion Date. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of the responsibilities assigned to them in the certificate.

**'19.4.4.1 Should the A-E confirm that the Work has achieved Substantial Completion on the date of his inspection**, the A-E shall derive that the Contractor was Substantially Complete on the date of receipt of the notification from the Contractor indicated above.

**'19.4.4.2 When the Owner accepts Substantial Completion and occupies a building**, all operations, maintenance, utilities and insurance become the responsibility of the Owner, except those items specifically identified in the Certificate of Substantial Completion as remaining to be completed by the Contractor.

**'19.4.4.3** If, after making the inspection, the A-E fails to find that the Contractor's Work has achieved Substantial Completion, he will notify the Contractor in writing, giving the reasons therefore.

**'19.4.4.4** If the A-E through its inspection fails to find that the Contractor's Work has not achieved Substantial Completion and is required to repeat all, or any portion, of its inspection, the Contractor shall bear the cost of such repeat inspections which cost may be deducted by the Owner from any payment then or thereafter due the Contractor. This deduction by the Owner from any payment for this reason will be by a credit to the Contract Sum by Change Order.

**'19.5 Final Completion of the Work.** The A-E, upon receipt of written notice from the Contractor that the Work is finally complete and is ready for final inspection and acceptance, will promptly make such inspection and when he finds the Work completed and acceptable under the Contract Documents and the Contract fully performed, he will so notify the Contractor in writing, and the Contractor shall promptly issue a final Certificate of Payment to the Owner.

**'19.5.1** "Final Completion or "Finally Complete" means the point in time when:

**'19.5.1.1 The progress of the Work**, is fully complete and functional in accordance with the requirements of the Contract Documents such that no items listed in the Punch list remain uncorrected;

**'19.5.1.2 The applicable Governmental Authorities** have issued a final certificate of occupancy;



**'19.5.1.3 The A-E** has issued an Owner approved certificate of Final Completion for the Work, in accordance with the terms of the Contract Documents;

**'19.5.1.4 Warranty Binder**, have been reviewed and approved by the A-E.

**'19.5.1.4.1** Note that the Contractor shall submit a binder with original copies of all required Warranties prior to the anticipated Date of Final Completion in order to allow the A-E reasonable time to review and approve or reject the submittal.

**'19.5.1.4.2** The A-E shall review and approve or reject the Warranties within a reasonable time after receipt from the Contractor. The Date of Final Completion shall not be earlier than the date of receipt of the Warranty Binder by the A-E where the Warranty Binder is subsequently approved by the A-E.

**'19.5.1.5 With respect to all of the Project's building systems, including, without limitation, all systems being Commissioned**, the Work, is fully commissioned without "Corrective Actions" remaining to be completed in compliance with the Contract Documents and applicable Laws ("Systems Commissioning"); The Date of Final Completion shall not be earlier than the date in which Systems Commissioning is fully completed including all "Corrective Actions".

**'19.5.1.6 The Contractor has submitted a final Application for Payment** including a Final Affidavit as required by the Commonwealth.

**'19.5.1.7 The Contractor and the A-E** have submitted to the Owner a report of the status of LEED Certification documentation when required by a project that is under LEED Certification. Included in these reports is a listing of documentation that will be required for the final LEED Certification during the one year warranty period.

**'19.5.2 Should the A-E confirm that the Work has achieved Final Completion** on the date of his inspection, the A-E shall derive that the Contractor was Finally Complete on the date of receipt of the notification from the Contractor indicated above.

**'19.5.3 If the A-E is unable to issue its final Certificate of Payment** and is required to repeat its final inspection of the Project, the Contractor shall bear the cost of such repeat inspection(s), which costs may be deducted by the Owner from the Contractor's final payment;

**'19.6 Use of Adequately Complete Portions.** The Owner may use or occupy a specified portion of the Work at any stage, provided that:

**'19.6.1** such use or occupancy is consented to by insurers and

**'19.6.2** it is authorized by the issuance of a Temporary Certificate of Occupancy or a Certificate of Occupancy by public regulatory bodies having jurisdiction over the Work; and

**'19.6.3** prior to such use or occupation, the affected portion of the Work is jointly inspected by the Owner, Contractor and A-E to determine the precise stage of completion.

**Such possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents. The Owner's use of adequately completed portions (with the Contractor's agreement), while the Work of**

**the Project is not actually Substantially Complete, shall not be deemed as a defining factor in determining that the Project has reached Substantial Completion.**

***'19.7 Liquidated Damages/ Damages from Untimely Performance***

**'19.7.1 The Contractor shall pay the Owner an amount identified in the Contract Documents** for each and every calendar day of unexcused delay in achieving Substantial Completion and Final Completion beyond the date set for each.

**'19.7.1.1 Any sums due and payable hereunder by the Contractor** shall be payable, not as a penalty, but as liquidated damages representing delay damages sustained by the Owner, estimated at the time of executing this Contract.

**'19.7.1.2 When the Owner is able to determine an actual sum of Damages** from Untimely Performance, and that sum is less than the predetermined "Liquidated Damages", the Owner may, upon review of the particular circumstances of this specific Project, elect to apply the lesser amount of damages.

**'19.7.2 When the Owner reasonably believes that Substantial Completion will be inexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the Owner to be adequate to recover liquidated damages applicable to such delays.** If and when the Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages.

**'19.7.3 The Contractor shall not have the right without justifiable cause** to contest the Owner's assessment of Liquidated Damages as defined by this Article and as indicated in the Special Conditions.

**'19.7.3.1 Should the Contractor believe he has justifiable cause for contesting the Owner's assessment of Liquidated Damages,** once the project work has achieved FINAL COMPLETION, the Contractor may submit to the Director of the Division of Engineering and Contract Administration written detailed explanation of the justifiable cause for contesting the Owner's assessment of Liquidated Damages.

**'19.7.3.1.1 Within fifteen (15) calendar days of the issuance of a Change Order which includes the Owner's assessment of Liquidated Damages,** the Contractor shall provide written notification to the Director of the Division of Engineering and Contract Administration of the Contractor's intent to contest the Owner's assessment of Liquidated Damages. Failure of the Contractor to make such written notification shall cause the Owner to execute the Change Order which includes the Owner's assessment of Liquidated Damages.

**'19.7.3.1.2 The Contractor's submission of the Final Application for Payment shall be evidence that the Contractor does not desire to contest the Owner's assessment of Liquidated Damages** and shall be evidence of the Contractor's agreement with the Owner's assessment of Liquidated Damages.

**'19.7.3.1.3 When the Director of the Division of Engineering and Contract Administration has reviewed** the submitted evidence from the Contractor, gathered other evidence and information related to the Contractor's contesting of the Owner's assessment of Liquidated Damages, and made a determination as to the, reasonableness, validity

and standing of the Contractor's contesting, the Director shall issue a final determination in the matter.

## **'20. Correction of Work**

**'20.1 Correction of Work Prior to Final Payment.** The Contractor shall promptly correct Work which is rejected by the A-E as failing to conform to the requirements of the Contract Documents. Such correction shall be required regardless of whether or not the nonconformities are observed before or after Substantial Completion, or whether or not the work has been fully fabricated, installed or completed.

**'20.2 Correction of Work After Final Payment.** Neither the Final Certificate of payment nor any provisions in the Contract Documents shall relieve the Contractor of responsibility for failure to conform to the requirements of the Contract Documents.

**'20.2.1 If within one year after the date of Final Completion** of the Work or designated portion thereof or after the date for commencement of warranties, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct the Work promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition.

**'20.2.1.1 This period of one year shall be extended with respect to portions of Work first performed after Final Completion** by the period of time between Final Completion and the actual performance of the Work. This obligation under this paragraph shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the conditions.

**'20.3 Responsibility for Related Costs.** In addition to being responsible for correcting the Work and removing any nonconforming Work or materials which are not corrected from the jobsite, the Contractor shall bear all other costs of bringing the affected Work into compliance with the Contract Documents. These include costs of any required additional testing and inspection services, A-E's services, and any resulting damages to property or to construction Work of other contractors or of the Owner.

**'20.4 Correction by Owner.** If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may take steps to correct the Work itself. If, within a ten (10) business day period after receipt of written notice to correct the nonconformity, the Contractor has not made serious efforts to correct the nonconformity, the Owner may without prejudice to any other remedies it may have, proceed to correct the non-conforming Work.

**'20.4.1** In such cases a Change Order shall be issued by the Owner with the approval of the A-E reflecting an equitable deduction from the Contract Sum to cover the cost of correcting the Work, including compensation for the A-E's additional services and other related expenses and damages. The amount of the Change Order shall be deducted from payments then or thereafter due the Contractor. If final payment has already been made, the Contractor shall pay the difference within a reasonable time, which is generally defined as 30 calendar days from the date of written request for such reimbursement by the Owner.

**'20.5 Ongoing Liability of Contractor for Defective Work.** The foregoing provisions establishing the specific obligation of the Contractor to perform corrective Work do not establish a period of limitations on other obligations of the Contractor under the Contract Documents. Even after the Contractor is no longer specifically obligated to perform corrective Work itself, it

shall still be held liable for nonconforming Work and for other breaches of its obligations under the Contract Documents.

**'20.6 Deduction for Uncorrected Work.** If the Owner deems it not expedient to correct Work which is not in accordance with the requirements of the Contract Documents, an appropriate Change Order shall be issued by the Owner with the approval of the A-E reflecting an equitable deduction from the Contract Sum on account of the uncorrected Work. The amount of the Change Order shall be deducted from payments then or thereafter due the Contractor. If final payment has already been made, the Contractor shall be responsible for paying the difference to the Owner within a reasonable time, which is generally defined as 30 calendar days from the date of written request for such reimbursement by the Owner.

## **'21. Suspension of Work**

**'21.1 Suspension by the Owner.** The Owner shall have the right at any time to direct the contractor to suspend its performance, or any portion thereof for a period of not more than thirty (30) calendar days. The notice of suspension shall be in writing and shall set forth the reason for the suspension. The written notice shall fix the approximate date on which Work is contemplated to be resumed. The Owner shall pay the Contractor as full compensation for such suspension the Contractor's Direct Job Expenses.

**'21.1.1 Should the Contractor believe that the Owner, by its actions, has suspended the Work,** but has not received a written notice of suspension from the Owner, the Contractor shall notify the Owner in writing that he believes a suspension of the Work has occurred and seek clarification from the Owner that such suspension of the Work is the Owner's intent by its actions. The Owner will promptly clarify for the Contractor its intentions related to suspension of the Work.

**'21.1.2 Without such written notice of suspension of the Work by the Owner,** the Contractor shall proceed with the Work as if it was not suspended and shall not be eligible for compensation as indicated in paragraph '21.1 above.

**'21.2 Other Suspension.** In the event the Owner should be prevented from proceeding with the work due to a bid protest, or enjoined by court order from proceeding with the Work or from authorizing its prosecution, either before or after the award, for a period up to ninety (90) calendar days, the delay shall not constitute cause for termination by the Contractor and the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, but time for completion of Work shall be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay. Such determination shall be set forth in a Change Order shall be final and binding upon both parties, and shall not require the signature of the Contractor to be in effect.

The Owner shall pay the Contractor as full compensation for such suspension the Contractor's reasonable costs actually incurred and paid as follows:

**'21.2.1** demobilization and remobilization, including such costs paid to subcontractors;

**'21.2.2** preserving and protecting work in place;

**'21.2.3** storage of materials or equipment purchased for the Project, including insurance thereon;

**'21.2.4** performing in a later, or during a longer, time frame than contemplated by this Contract.

**'21.3 Termination by the Contractor due to Suspension of the Work by the Owner.** If, through no act or fault of the Contractor, the Work is suspended for a period of more than thirty (30) calendar days by the Owner, or more than ninety (90) calendar days under an Order of

the Court or other public authority, then the Contractor may, after ten (10) business days from delivery of a written notice to the Owner and the A-E, terminate the Contract and recover from the Owner payment for all Work executed and reasonable expenses sustained.

**'21.3.1 If the A-E has failed to act on a request for payment,** within thirty (30) calendar days of submission, or if the Owner has failed to make any payment, within forty-five (45) calendar days of receipt of an approval application for payment, the Contractor may, upon ten (10) business days written notice to the Owner and the A-E stop the Work until he has been paid all amounts then due, in which event and upon resumption of the Work, a Change Order shall be issued adjusting the Contract Price or extending the Contract Time, or both, to compensate for the costs and delays attributable to the stoppage of the work, any such compensation being subject to the provisions, conditions and limitations contained in Article 26.

## **'22. Termination**

**'22.1 Termination of Contract for Convenience of Owner.** The Owner, for any reason whatsoever, may terminate the Contract for its own convenience when it determines that such termination will be in the best interest of the Commonwealth of Kentucky. The Owner shall give written notice of such termination to the Contractor specifying when termination becomes effective. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of Subcontracts and orders. The Owner may direct the Contractor to assign the Contractor's right, title and interest under termination orders or subcontracts to the Owner or its designee. The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has. The Commonwealth shall negotiate a fair and just settlement with the Contractor in accordance with 200 KAR 5:312 Section 2. In such event, the following procedure shall be required:

**'22.1.1 The Contractor shall submit a termination claim to the Owner and the A-E** specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Owner or the A-E. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, the Owner shall pay the Contractor, an amount derived in accordance with paragraph (3) below;

**'22.1.2 The Owner and the Contractor may agree to the compensation,** if any, due to the Contractor hereunder pursuant to 200 KAR 5:312 Section 2;

**'22.1.3 Absent agreement to the amount due to the Contractor,** the Owner shall pay the Contractor the following amounts:

**'22.1.3.1 Contract prices** for labor, materials, equipment and other services accepted under this Contract;

**'22.1.3.2 Reasonable costs** incurred in preparing to perform and in performing the terminated portion of the Work and in terminating the Contractor's performance, plus a fair and reasonable allowance for direct jobsite overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

**'22.1.3.3 Reasonable costs** of settling and paying claims arising out of the termination of subcontracts or orders pursuant to the initial Paragraph of 22.1. These costs shall not include amounts paid in accordance with other provisions hereof.

**'22.1.3.4 The total sum to be paid the Contractor under 22.1** shall not exceed the total Contract Sum, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

**'22.2 Termination of Contract for Cause.** If the Contractor should be adjudged as bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency or, if the Contractor does not perform the Work, or any part thereof, in a timely manner, supply adequate labor, supervisory personnel or proper equipment or materials, or if it fails to timely discharge its obligations for labor, equipment and materials, or proceeds to disobey applicable law, or otherwise commits a violation of a material provision of the resulting Contract, then the Owner, in addition to any other rights it may have against the Contractor or others, may terminate the performance of the Contractor upon ten (10) days written notice by registered mail of declaration of default and assume possession of the Project site and of all materials and equipment at the site and may complete the Work.

**'22.2.1 In such case, the Contractor shall not be paid further until the Work is complete.** After final completion has been achieved, if any portion of the Contract Sum, as it may be modified hereunder, remains after the cost to the Owner of completing the Work, including all costs and expenses of every nature incurred, has been deducted by the Owner, such remainder shall belong to the Contractor. Otherwise, the Contractor shall pay and make whole the Owner for such cost. This obligation for payment shall survive the termination of the Contract. In the event the employment of the Contractor is terminated by the Owner for cause pursuant to this Paragraph 22.2 and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Paragraph 22.1 and the provisions of Paragraph 22.1 shall apply.

### **'23. Indemnification**

**The Contractor shall indemnify and hold the Owner harmless** from any and all claims, liability, damage, loss, cost and expense of every type whatsoever, regardless of whether such liability, claim, damage, loss, cost or expense is caused in part by the Owner, including, without limitation, attorneys' fees and expenses, in connection with the Contractor's performance of this Contract, provided that such claims, liability, damage, loss, cost or expense is due to sickness, personal injury, disease or death, or to loss or destruction of tangible property (other than the Work itself), including loss of use resulting therefrom, to the extent caused by the Contractor, or anyone for whose acts the Contractor may be liable.

### **'24. Insurance**

**'24.1 The Contractor shall furnish the Owner with certificates evidencing the required insurance coverage** prior to commencing work. Contractor shall keep up-to-date copies of such certificates on file with Owner until work is completed. Owner may require Contractor to submit policy endorsements or complete policy copies of the required insurance.

**'24.2 Contractor shall procure and maintain for the duration of the contract insurance** against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees or subcontractors.

**'24.3 Minimum Scope of Insurance** Coverage shall be at least as broad as:



**24.3.1** Insurance Services Office commercial general liability coverage ("occurrence" Form CG 0001, Ed. 10/93).

**24.3.2** Insurance Services Office Form CA 0001 (Ed. 12/93) covering automobile liability, Code 1 "any auto."

**24.3.3** Workers' compensation insurance as required by the Workers' Compensation Act (as contained in KRS Chapter 342) and employers liability insurance.

**'24.4 Minimum Limits of Insurance** Contractor shall maintain limits no less than:

**24.4.1 Commercial General Liability:**

\$1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage with a \$3,000,000 annual aggregate. The deductible or Self-Insured Retention per occurrence shall not be more than \$10,000.

**24.4.2 Automobile Liability:** \$500,000 combined single limit per accident for bodily injury and property damage.

**24.4.3 Workers' Compensation and Employers Liability:** Workers' compensation with statutory benefits without limit, as required by the Kentucky Workers Compensation Act, and employer's liability limits of \$1,000,000 per accident.

**'24.5 Other Insurance Provisions** The policies are to contain, or be endorsed to contain, the following provisions:

**'24.5.1 Commercial General Liability and Automobile Liability Coverages.**

**'24.5.1.1 Owner, its officers and employees are to be covered as insureds as respects:** liability arising out of activities performed by or on behalf of the Contractor; general supervision of the work by Owner; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor, or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to Owner, its officers or employees.

**'24.5.1.2 The Contractor's insurance coverage shall be primary insurance as respects Owner,** its officers and employees. Any insurance of self-insurance maintained by Owner shall be excess of the Contractor's insurance and shall not contribute to it.

**'24.5.1.3** Any failure to comply with reporting provisions of the policies shall not affect coverage provided to Owner, its officers or employees.

**'24.5.1.4** The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought except with respect to the limits of the insurer's liability.

**'24.5.2 All Coverages.** Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to Owner.

**'24.6 Acceptability of Insurers** Insurance is to be placed with insurers with an A.M. Best's rating of no less than A VII, authorized to write insurance in the Commonwealth of Kentucky.

**'24.7 Verification of Coverage** The Contractor shall furnish the Owner with certificates evidencing the required insurance coverage prior to commencing work. Contractor shall keep up-to-date copies of such certificates on file with Owner until work is completed. Owner may

require Contractor to submit policy endorsements or complete policy copies of the required insurance.

**'24.8 Subcontractors** Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

**'24.9 The Contractor shall provide all Risks Insurance** in an amount of not less than one hundred percent (100%) of the insurable value of all the work. The coverage, is to be written on CP 00 20 06 95 or equivalent acceptable to the Commonwealth. All coinsurance clauses in the Risks Insurance policy will be waived. All rights of subrogation against the Owner (i.e. the Commonwealth) will be waived by the insurer. Such insurance shall be for the benefit of the Contractor, Owner and any Subcontractor engaged on this project, as the Owner shall find their respective interest may appear. The Risks Insurance must be dated and in force on the date indicated in the Contract to begin work.

**'24.10 The insurance coverage required by the contract documents shall be in compliance with the laws of the Commonwealth of Kentucky** and shall be placed with a licensed resident or non-resident agent who represents insurance companies authorized to do business in Kentucky.

**'24.11** The Certificate of Insurance or Certificates of Insurance will have the following endorsements as an attachment to the Certificate or Certificate's.

**'24.11.2** The Commonwealth of Kentucky, Division of Engineering and Contract Administration will be named as an additional insured.

**'24.11.3** The policy is primary coverage and any insurance or self-insurance maintained by the Commonwealth of Kentucky shall be excess.

**'24.11.4** Any failure of the named insured to comply with the reporting provisions of the policy shall not affect coverage provided to the Commonwealth of Kentucky, it's officers or employees.

**'24.11.5** All Coverages. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to Owner.

## **'25. Performance and Payment Bonds**

**The Contractor shall furnish separate performance and payment bonds to the Owner.** The Contractor shall furnish a performance bond satisfactory to the Owner in an amount equal to one hundred percent (100%) of the Contract Sum as security for the faithful performance of the Contract. The Contractor shall also furnish a payment bond satisfactory to the Owner in an amount equal to one hundred percent (100%) of the Contract Sum for the protection of all persons performing labor or furnishing materials, equipment or supplies for the Contractor or his Subcontractor for the performance of the Work provided for in the Contract, including security for payment of all unemployment contributions which become due and payable under Kentucky Unemployment Insurance Law.

**'25.1 Each bond furnished by the Contractor shall incorporate** by reference the terms of the Contract as fully as though they were set forth verbatim in such bonds. In the event the Contract Sum is adjusted by Change Order executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amount.



**'25.2 The performance and payment bonds shall be executed** by a surety company authorized to do business in this Commonwealth, and the contract instrument of bonds must be countersigned by a duly appointed and licensed resident agent.

**'26. Claims by the Contractor/ Concealed Conditions/ Disputes**

**'26.1** Claims by the Contractor against the Owner are subject to the following:

**'26.1.1 All Contractor claims against the Owner shall be initiated by a written claim** submitted to the Owner and the A-E. Such claim shall be filed with the Owner and the A-E no later than seven (7) calendar days after the event, or the first appearance of the circumstances, causing the claim, and same shall set forth in detail all known facts and circumstances supporting the claim;

**'26.1.2 The Contractor and the Owner shall continue their performance** regardless of the existence of any claims submitted by the Contractor.

**'26.1.3 In the event the Contractor discovers previously concealed and unknown site conditions** which differ materially from those indicated in the Contract Documents, or unknown site conditions which are materially at variance from those typically and ordinarily encountered in the general geographical location of the Project, the Contract Sum shall be modified, either upward or downward, upon the written claim made by either party within seven (7) calendar days after the first appearance to such party of the circumstances.

**'26.1.3.1 As a condition precedent** to the Owner having any liability to the Contractor due to concealed and unknown conditions, the Contractor must give the Owner and the A-E written notice of, and an opportunity to observe, such condition prior to disturbing it.

**'26.1.3.2 The failure by the Contractor to give the written notice** and make the claim as provided by this paragraph shall constitute a waiver by the Contractor of any rights arising out of or relating to such concealed and unknown condition;

**'26.1.4 In the event the Contractor seeks to make a claim** for an increase in the Contract Sum, as a condition precedent to any liability of the Owner therefor, the Contractor shall strictly comply with the requirements of the first paragraph of this Article and such claim shall be made by the Contractor before proceeding to execute any additional or changed Work. Failure of the condition precedent to occur shall constitute a waiver by the Contractor of any claim for additional compensation;

**'26.1.5 In connection with any claim by the Contractor** against the Owner for compensation in excess of the Contract Sum, any liability of the Owner for the Contractor's cost shall be strictly limited to direct cost incurred by the Contractor and shall in no event include indirect cost or consequential damages of the Contractor. The Contractor shall provide a detailed breakdown of the direct cost incurred by the Contractor. The inclusion of the Contractor's 15% OHP to this direct cost shall constitute the Owner's reimbursement to the Contractor for all indirect cost and consequential damages.

**'26.1.6 The Owner shall not be liable to the Contractor** for claims of third-parties including subcontractors, unless and until liability of the Contractor has been established therefor in a court of competent jurisdiction;

**'26.2 In the event the Contractor should be delayed in performing any task** which at the time of the delay is then critical, or which during the delay becomes critical, as the sole result of any act or omission by the Owner or someone acting in the Owner's behalf, or by Owner-authorized Change Orders, unusually bad weather not reasonably anticipatable, fire or other

Acts of God, the date for achieving Substantial Completion, or, as applicable, final completion, shall be appropriately adjusted by the Owner upon the written claim of the Contractor to the Owner and the A-E.

**'26.2.1 An extension of time shall not mean** that the Contractor is entitled to additional compensation.

**'26.2.2 A task is critical within the meaning of this paragraph** if, and only if, said task is on the critical path of the Project schedule so that a delay in performing such task will delay the ultimate completion of the Project.

**'26.2.3 Any claim for an extension of time by the Contractor** shall strictly comply with the requirements of the first paragraph of this Article above. If the Contractor fails to make such claim as required in this paragraph, any claim for an extension of time shall be waived.

**'26.3 All claims under this Contract shall be made in accordance** with KRS 45A.225 to 45A.290. The provisions of these statutes do not toll the running of the Statute of Limitations set forth in KRS 45A.260. Any suit pursuant to KRS 45A.245 shall be commenced within one (1) year of the Substantial Completion Date specified in the Contract. If the Contractor does not commence suit within one (1) year of the date specified in the Contract, the Contractor shall be foreclosed from proceeding in court pursuant to KRS 45A.245.

**'26.3.1 The Owner and Contractor agree** that any suit, action or proceeding with respect to this Contract may only be brought in or entered by the courts of the Commonwealth of Kentucky situated in Frankfort, Franklin County, Kentucky, or the United States District Court for the Eastern District of Kentucky, Frankfort Division, and the parties hereby submit to the non-exclusive jurisdiction of such courts for the purpose of any such suit, action, proceeding or judgment and waive any other preferential jurisdiction by reason of domicile or location. The parties hereby agree that any such legal action shall be tried by the court sitting without a jury. The parties hereby irrevocably waive any objection that they may now or hereafter have to the laying of venue of any suit, action or proceeding arising out of or related to this Contract brought in the courts of the Commonwealth of Kentucky situated in Frankfort, Franklin County, Kentucky, or the United States District Court for the Eastern District of Kentucky, Frankfort Division, and also hereby irrevocably waive any claim that any such suit, action or proceeding brought in any one of the above-described courts has been brought in an inconvenient forum.

## **'27 Liens**

The filing and perfection of liens for labor, materials, supplies and rental equipment supplied on the work are governed by KRS 376.195 to 376.260.

**'27.1 The lien shall attach only to any unpaid balance** or retainage due the Contractor for the improvement from the time a copy of statement of lien, attested by the County Clerk, is delivered to the Owner, pursuant to the provisions of KRS 376.240

**'27.2 Statements of lien shall be filed with the Franklin County Clerk** and action to enforce the same must be instituted in the Franklin Circuit Court, Frankfort, Kentucky, pursuant to KRS 376.250(2).

## **'28 Assignments**

Neither party to the Contract shall assign the Contract, or any portion thereof without the written consent of the other, nor shall the Contractor assign any monies due or to become due to him hereunder without notification to the Owner. Notification of Assignments, shall be given on State

forms and in accordance with the procedures and regulations of the Finance and Administration Cabinet.

### **'29 Separate Contracts**

**'29.1 Owner's Right to Perform Construction and to Award Separate Contracts.** The Owner reserves the right to let other contracts in connection with the Project or to perform Work with its own forces. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work and shall properly connect and coordinate his Work with theirs.

**'29.1.1 If any part of the Contractor's Work depends** for proper execution or results upon the Work of any other contractor, the Contractor shall promptly report to the A-E any observed defects in such Work that render it unsuitable for proper execution or connection. His failure to inspect and report shall constitute an acceptance of the other contractor's Work as fit and proper for the reception of his Work, except as to defects which may develop in the other contractor's Work after the execution of his Work.

**'29.1.2 If any part of another contractor's work depends on the Contractor's Work for proper** execution, the Contractor shall promptly perform that Work as required to allow the other contractor's work to progress as originally intended by the Owner's separate contract with that contractor.

**'29.1.3** Whenever Work being done by the Owner's forces or by other Contractors work under separate agreement with the Owner is contiguous to Work covered by this Contract, the respective rights of the various interests involved shall be established by the A-E to secure the completion of the various portions of the Work in general harmony.

**'29.2 Mutual Responsibility of Contractors.** Should the Contractor cause damage to any separate contractor on the Work, the Contractor agrees, upon due notice, to settle with such contractor if he will so settle. If such separate contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense and if any judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.

### **'30 Allowances**

**'30.1 The Contractor shall have included in the Contract Sum all allowances stated in the Contract Documents** and shall cause the Work so designated to be done as the Owner may direct. If the actual price for purchasing the "allowed material" is more or less than the "cash allowance," the Contract Sum shall be adjusted accordingly.

**'30.2 The adjustment in Contract Sum shall be made on the basis** of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "allowed materials" shall be included in the applicable sections of the Contract specifications covering this Work. (see Article 14, paragraph 14.2 for more information).

### **'31 Project Meetings**

**'31.1 Pre-Construction Conference:** No later than 10 calendar days after execution of the Contract a Pre-Construction Conference will be held at the Project Site or another convenient location. This meeting will be scheduled by the Owner through the A-E.

**'31.1.1 Attendance at the Pre-Construction conference is mandatory for the following personnel:** Authorized Representatives of the Owner; A-E and their

consultants; Contractor and his Project Manager, Job Superintendent and key personnel; all major subcontractors; Using Agency on-site personnel; and other persons designated by the A-E, Owner, or Contractor to be critical to the project.

**'31.1.2** All participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

**'31.1.3** Agenda for the meeting will include all matters indicated in the DECA Capital Construction Procedures Manual related to the project. The meeting will be conducted by the A-E and minutes distributed within three working days following the meeting.

**'31.2 Pre-Installation Conferences:** Pre-installation Conferences shall be held at the Project Site or another convenient location for any item of the work requiring a pre-installation conference. The conference is required PRIOR to each construction activity that requires coordination with other construction.

**'31.2.1 Attendance at the Pre-Installation Conference is mandatory for the following personnel:** Authorized Representatives of the Owner; A-E and their consultants who have responsibilities related to the installation; Contractor and his Project Manager, Job Superintendent and key personnel; all subcontractors with work related to the installation; Installers of the work; Manufacturer's and Fabricator's Representatives related to the installation; and other persons designated by the A-E, Owner, or Contractor to be critical to the project.

**'31.2.2** All participants shall be familiar with the up-coming installation and authorized to conclude matters relating to the Work.

**'31.2.3** Agenda for the meeting will include all matters indicated in the DECA Capital Construction Procedures Manual related to the project. The meeting will be conducted by the Contractor and minutes distributed within three working days following the meeting.

**'31.3 Project Progress Meetings:** At regular intervals during the construction (a minimum of monthly, but may be more frequently at the discretion of the A-E/ Owner, Project Progress Meetings will be held at the Project Site or another convenient location. This meeting will be scheduled at the Pre-Construction Conference or when more frequently needed by the Owner through the A-E.

**'31.3.1 Attendance at the Project Progress Meeting is mandatory for the following personnel:** Authorized Representatives of the Owner; A-E and their consultants; Contractor and his Project Manager, Job Superintendent and key personnel; all major subcontractors who have work completing, continuing or commencing; Using Agency on-site personnel; and other persons designated by the A-E, Owner, or Contractor to be critical to the project.

**'31.3.2** All participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

**'31.3.3** Agenda for the meeting will include all matters indicated in the DECA Capital Construction Procedures Manual related to the project. The meeting will be conducted by the A-E and minutes distributed within three working days following the meeting.

**'31.3.4** Elsewhere in these General Conditions are submittals and other requirements of the Contractor that are to be provided at each Project Progress Meeting (i.e. updated Project Schedule, updated submittal log; updated RFI log, etc.

## **'32. Miscellaneous Provisions Regarding Contractor's Work**

**'32.1 Project Site Limits.** The Contractor shall confine his apparatus, the storage of materials, and the operations of his workmen to Project site limits indicated by the Contract Documents.

**'32.2 Points of Reference.** The Contractor shall carefully preserve bench marks, reference points and stakes, and in case of willful or careless destruction, he shall be charged with the resulting expense of replacement and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

**'32.3 Cutting and Patching.** The Contractor shall be responsible for cutting, fitting or patching required to complete the Project or make its parts fit together in a proper manner. The Contractor shall not endanger other parts of the Project, including work by the Owner or other contractors as provided in Article 29, by cutting, patching, or excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a separate contractor without written consent of the Owner or such separate contractor. Such consent shall not be unreasonably withheld.

**'32.4 Cleanup.** The Contractor shall at all times keep the Project premises and surrounding area free from the accumulation of waste materials or rubbish caused by his operations in connection with the Project. Upon completion of the Work, and prior to final inspection and acceptance, the Contractor shall remove all remaining waste materials, rubbish, Contractor's construction equipment, tools, machinery, and surplus materials and leave the Project (including but not limited to glass, hardware, fixtures, masonry, tile and marble) in a clean and usable condition satisfactory to the A-E. Floors shall be cleaned and waxed in accordance with the requirements of the Contract specifications. If the Contractor fails to clean up as provided in the Contract Documents, the Owner may perform the cleaning tasks and charge the cost to the Contractor by Change Order.

### **'32.5 Guarantees, Warranties and "As-Built" Drawings.**

**'32.5.1** Prior to final payment for the Work, the Contractor shall assemble and present to the A-E all guarantees and warranties required by the Contract Documents.

**'32.5.2** All warranties for materials, equipment and installations constructed by this project shall commence on the Date of Substantial Completion and continue for the period of time indicated for the specific material, equipment or installation.

**'32.5.3** Additionally the Contractor shall provide "Record" Drawings prior to final payment.

**'32.6 Governing Law.** The Contract shall be governed by the laws of the Commonwealth of Kentucky.

**'32.6.1 Statutory Limitation Periods.** Statutes of Limitations are governed by KRS 45A.260(2).

**'32.6.2 Written Notice.** Written notice shall be deemed to have been given if delivered in person to the individual or to a member of the organization or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last known business address known to the notifying party.

**'33. Apprentices**

Apprentices (for all classifications of work) shall be permitted to work only under an apprenticeship agreement approved by the Kentucky Supervisor of Apprenticeship and by the Kentucky Apprenticeship Council which is recognized by the Bureau of Apprenticeship and Training, U. S. Department of Labor.

**'34. Nondiscrimination in Employment**

During the performance of the Contract, the Contractor agrees as follows:

**'34.1** The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin, or disability in employment.

**'34.2** The Contractor will take affirmative action in regard to employment, upgrading, demotion, transfer, recruitment, recruitment advertising, layoff, termination, rates of pay or other forms of compensation, and selection for training, so as to ensure that applicants are employed and that employees during employment are treated without regard to their race, color, religion, sex, age, or national origin; however, when layoffs occur, employees shall be laid off according to seniority with the youngest employees being laid off first. When employees are recalled, this shall be done in the reverse way the employees were laid off;

**'34.3** The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, or national origin;

**'34.4** The Contractor will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provisions of the nondiscrimination clauses required by this section;

**'34.5** The Contractor shall send to each labor union or representatives of workers with which he has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or workers' representatives of the Contractor's commitments under this section.

Failure to comply with the above nondiscrimination clause constitutes material breach of Contract.

**'35 Affirmative Action; Reporting Requirements**

**'35.1** The Contractor and Subcontractors are exempt from any affirmative action or reporting requirements, under the Kentucky Equal Employment Act of 1978, KRS 45.560 to 45.640 hereinafter referred to as The Act, if any of the following conditions are applicable:

(1) the Contract or subcontract awarded is in the amount of five hundred thousand dollars (\$500,000) or less, and the amount of the contract is not a subterfuge to avoid compliance with the provisions of The Act; or

(2) the Contractor or Subcontractor utilizes the services of fewer than eight (8) employees during the course of the Contract ; or

(3) the Contractor or subcontractor employs only family members or relatives; or



(4) the Contractor or Subcontractor employs only persons having a direct Ownership interest in the business and such interest in not a subterfuge to avoid compliance with the provisions of The Act.

**'35.2 The Contractor or Subcontractor not otherwise exempted** shall for the duration of the Contract, hire minorities from within the drawing area to satisfy the agreed upon goals and timetables set out in addenda to the Contract. Should the union with which the Contractor has collective bargaining agreements be unwilling to provide sufficient minorities to satisfy the goals and timetables, the Contractor shall hire minorities from other sources within the drawing area to satisfy the goals and timetables in the addenda to the Contract.

**'35.3** The equal employment provisions of The Act may be met in part by the Contractor subcontracting to a minority contractor or subcontractor. A minority contractor or subcontractor shall be defined by the addenda to this Contract, or if none, by the Act.

**'35.4** Each Contractor shall, for the length of the Contract, furnish such information as required by The Act and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with The Act and such rules, regulations and orders issued pursuant thereto.

**'35.5** If the Contractor is found to have committed an unlawful practice against a provision of The Act during the course of performing under this Contract, (if covered by The Act), the Owner may cancel or terminate the Contract, conditioned upon a program for future compliance approved by the Owner. The Owner may also declare such Contractor ineligible to bid on further contracts until such time as the Contractor complies in full with the requirements of The Act.

**'35.6** The Contractor shall not be required to terminate an existing employee, upon proof that employee was employed prior to the date of the Contract nor hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

### **'36 Access to Records**

**'36.1 The contractor, as defined in KRS 45A.030(7), agrees that the contracting agency,** the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review.

**'36.2 Furthermore, any books, documents, papers, records, or other evidence provided to the contracting agency,** the Finance and Administration Cabinet, the Auditor of Public Accounts, or the Legislative Research Commission which are directly pertinent to the contract shall be subject to public disclosure regardless of the proprietary nature of the information, unless specific information is identified and exempted and agreed to by the Secretary of the Finance and Administration Cabinet as meeting the provisions of KRS 61.878(1)(c) prior to the execution of the contract.

**'36.3 The Secretary of the Finance and Administration Cabinet shall not restrict** the public release of any information which would otherwise be subject to public release if a state government agency was providing the service. (22 Ky.R. 1510; eff. 5-16-96.)

**'37 Commonwealth Project Forms and other weblinks:**

**'37.1 The Commonwealth of Kentucky does not recognize any project forms from third party sources** (i.e. American Institute of A-Es; Association of Construction and Development; Association of General Contractors; etc.) unless the Commonwealth has not adopted specific documents.

**'37.1.1 When the Commonwealth has not adopted specific documents for a construction document purpose**, other documents may be used provided that they do not conflict with these General Conditions and other documents and contracts of the Commonwealth in any respect.

**'37.1.2 Any conflict between a construction document utilized** and any provision of these General Conditions or other documents and Contracts of the Commonwealth, shall be immediately considered null and void.

**'37.2 The weblink to the State Planroom site where Commonwealth Construction forms, contracts, and manuals are located is:**

<https://finance.ky.gov/services/stateplan/Pages/ConstructionFormsandInformation.aspx>

**37.2.1 A listing of documents available on this site includes the following:**

Required Affidavits and Statements

- Affidavit for Final Payment (B-210-13)
- Affidavit for Bidder, Offerors and Contractors
- Vendor Report of Prior Violations

Invoices and Change Order Form

- DOA-24 Invoice \*For contracts greater than \$400,000 (05-06-08)
- SAS-25 Invoice Short Form \*For contracts less than \$400,000 (09-29-11)
- SAS-25 A-Eing Consultants Form (11-19-10)
- SAS-42 Change Order Form (09-27-06)

Example Invoice Forms

- DOA-24 Continuation Sheet (Example)
- DOA-24 Long Form (Example) (09-27-06)
- SAS-25 Short Form (Example) (09-29-11)

EEO Forms

- Affidavit of Intent to Comply
- EEO-1: Employer Information Report
- Subcontractor Reporting Part

Manuals

- Capital Construction Project Procedures Manual (Updated 6-22-13)
- Technical Guidelines and Specifications - Complete Version (12-15-13)
- Capital Construction Project Procedures manual (Full collection)

**'37.3 The weblink to the State's Document Collaboration System is:**

<https://www.stateofkyprojects.com/>

**'37.3.1 This Document Collaboration System shall be used** for all official and/or required communication and documentation of any Capital Construction Project where these General Conditions apply.

**END OF GENERAL CONDITIONS**



## Payment Bond - Part IV

**CONTRACTOR** (Name and Address):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SURETY** (Name and Principal Place of Business):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**OWNER** (Name and Address):

Commonwealth of Kentucky  
Finance and Administration Cabinet  
Bush Building 1<sup>st</sup> Floor  
403 Wapping Street  
Frankfort, KY 40601-2638

**CONSTRUCTION CONTRACT -** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**AMOUNT:** \_\_\_\_\_

**DESCRIPTION** (Name and Location)

Invitation No: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**BOND**

**DATE:** \_\_\_\_\_

**AMOUNT:** \_\_\_\_\_

**CONTRACTOR AS PRINCIPAL**

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

**SURETY**

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

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

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

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

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

Name, Address and Telephone of AGENT or BROKER: \_\_\_\_\_

Name, Address and Telephone of AGENT or BROKER: \_\_\_\_\_

Whereas, the Owner has required the Contractor to furnish this Payment Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

Now therefore, the Surety and the Contractor, both severally, and for themselves, their heirs, administrators, executors and successors agree:

1. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it were copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied, and, without limitation, specifically including Contractor's obligation to pay for labor, materials, services and equipment provided in connection with the Construction Contract performance.

2. For purposes of this Payment Bond, Beneficiary is defined as person or entity who has actually provided labor, material, equipment, services or other items for use in furtherance of the Construction Contract, and having:

- (A) a direct contract with the Contractor; or
- (B) a direct contract with a subcontractor of the Contractor; or
- (C) rights, under the laws of the jurisdiction where the Project is located, to file a lien, a claim or notice of lien, or otherwise make a claim against the Project or against funds held by the Owner, if the Project is, or were, subject to such filing.

3. The Surety shall not be obligated hereunder to a Beneficiary other than a Beneficiary having a direct contract with the Contractor unless such Beneficiary has given written notice of its claim to the Contractor and the Surety as follows:

(A) the period of time provided by the jurisdiction wherein the Project is located for (1) filing a lien, claim of lien, notice of lien, if the Project is, or were, subject to such filing (KRS 376.230), or (2) otherwise making a claim against the Project or against funds held by the Owner;

(B) address, the person or entity to whom such labor, material, equipment, services or other items were provided.

4. In no event shall the Surety be obligated hereunder for sums in excess of the Penal Sum as it may be modified by addendum.

5. Upon receipt of claim from a Beneficiary hereunder, the Surety shall promptly, and in no event later than 30 days after receipt of such claim, respond to such claim in writing (furnishing a copy of such response to the owner) by:

- (A) making payment of all sums not in dispute; and
- (B) stating the basis for disputing any sums not paid.

6. No action shall be commenced by a Beneficiary hereunder after the passage of the longer of two (2) years following the date on which the final payment of the contract falls due or, if this bond is provided in compliance with applicable law, any limitation period provided therein. If the limitation period contained in this Paragraph is unenforceable, it shall be deemed amended to provide the minimum period for an action against the Surety on a payment bond by a third-party beneficiary thereof.

7. Any and all notices to the Surety or the Contractor shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party above.

**Commonwealth of Kentucky  
Finance and Administration Cabinet  
Department for Facilities and Support Services  
Division of Engineering and Contract Administration**

**Performance Bond - Part V**

**CONTRACTOR** (Name and Address):

**SURETY** (Name and Principal Place of Business):

**OWNER** (Name and Address):

Commonwealth of Kentucky  
Finance and Administration Cabinet  
Bush Building 1<sup>st</sup> Floor  
403 Wapping Street  
Frankfort, KY 40601-2638

**CONSTRUCTION CONTRACT** - «ContractNumber»

DATE:

AMOUNT:

DESCRIPTION (Name and Location)

**BOND**

DATE:

AMOUNT:

**CONTRACTOR AS PRINCIPAL**

Company:  
(Seal)

(Corporate

Signature: \_\_\_\_\_  
Name and Title:

Name, Address and Telephone of AGENT or BROKER:

**SURETY**

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

Signature: \_\_\_\_\_  
Name and Title:

Name, Address and Telephone of AGENT or BROKER:

Whereas, the Owner has required the Contractor to furnish this Performance Bond containing the terms and conditions set forth herein as a condition to executing the Construction Contract with the Contractor;

Now therefore, the Surety and the Contractor, both severally, and for themselves, their heirs, administrators, executors and successors agree:

1. The Construction Contract is hereby incorporated herein and by reference made a part hereof to the same extent and effect as though it were copied verbatim herein. The Surety and the Contractor are bound for the full performance of the Construction Contract including without exception all of its terms and conditions, both express and implied.

2. If the Contractor is in default of the Construction Contract and the Owner, by written notice to the Contractor and the

Surety, declares the Contractor to be in default and terminates the right of the Contractor to proceed, the Surety shall thereupon promptly notify the Owner in writing as to which of the actions permitted to the Surety in Paragraph 3 it will take.

3. Upon the default and termination of the Contractor and notice to the Contractor and Surety as provided in Paragraph 2 above, the Surety shall within 30 days proceed to take one or, at its option, more than one of the following courses of action:

(A) Proceed itself, or through others acting on its behalf, to complete full performance of the Construction Contract including, without limitation, correction of defective and nonconforming work performed by or on behalf of the Contractor. During such performance by the Surety the Owner shall pay the Surety from its own funds only such sums as would have been due and payable to

the Contractor in the absence of the default and termination.

(B) Applicable law permitting, and with the prior written consent of the Owner, obtain bids or proposals from contractors previously identified as being acceptable to the Owner, for full performance of the Construction Contract. The Surety shall furnish the Owner a copy of such bids or proposals upon receipt of same. The Surety shall promptly select, with the agreement of the Owner, the best responsive bid or proposal and shall promptly tender the contractor submitting it, together with a contract for fulfillment and completion of the Construction Contract executed by the completing contractor, to the Owner for the Owner's execution. Upon execution by the Owner of the contract for fulfillment and completion of the Construction Contract, the completing contractor shall furnish to the Owner a Performance Bond and a separate payment bond, each in the form of those bonds previously furnished to the Owner for the project by the Contractor. Each such bond shall be in the penal sum of the (1) fixed price for completion, (2) guaranteed maximum price for completions, or (3) estimated price for completion, whichever is applicable. The Owner shall pay the completing contractor from its own funds only such sums as would have been due and payable to the Contractor under the Construction Contract as and when they would have been due and payable to the Contractor in the absence of the default and termination. To the extent that the Owner is obligated to pay the completing contractor sums which would not have then been due and payable to the Contractor under the Construction Contract, the Surety shall provide the Owner with such sums in a sufficiently timely manner that the Owner can utilize such sums in making timely payment to the completing contractor; or.

(C) Take any and all other acts if any, mutually agreed upon in writing by the Owner and the Surety.

4. In addition to those duties set forth hereinabove, the Surety shall promptly pay the Owner all loss, costs and expenses resulting from the Contractor's default(s), including, without limitation, fees, expenses and costs for

architects, engineers, consultants, testing, surveying and attorneys, liquidated or actual damages, as applicable, for delay in completion of the Project, and fees, expenses and costs incurred at the direction, request, or as a result of the acts or omissions of the Surety.

5. In no event shall the Surety be obligated to the Owner hereunder for any sum in excess of the Penal Sum as it may be modified by addendum.

6. The Surety waives notice of any changes to the Construction Contract including, without limitation, changes in the contract time, the contract price, or the work to be performed.

7. This Performance Bond is provided by the Surety for the sole and exclusive benefit of the Owner, and, if applicable, any dual obligee designated by rider attached hereto, together with their heirs, administrators, executors, successors or assigns. No other party, person or entity shall have any rights against the Surety hereunder.

8. No action shall be commenced hereunder after the passage of the longer of two (2) years following the date on which the final payment of the contract falls due or, if this bond is provided in compliance with applicable law, any limitation period provided therein. If the limitation period contained in the Paragraph is unenforceable, it shall be deemed amended to provide the minimum period for an action against the Surety on a performance bond.

9. Any and all notices to the Surety, the Contractor or the Owner shall be given by Certified Mail, Return Receipt Requested, to the address set forth for each party above.

10. Any statutory limitation, which may be contractually superseded, to the contrary notwithstanding, any action hereon may be instituted so long as the applicable statute of limitations governing the Construction Contract has not run or expired.

## PART VI

### FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION

#### AGREEMENT BETWEEN OWNER AND CONTRACTOR

This **AGREEMENT**, between the Owner, the **COMMONWEALTH OF KENTUCKY**, and the Contractor \_\_\_\_\_

The Architect is: \_\_\_\_\_

This Agreement, properly by the parties, shall be final and binding only upon the issuance of the Finance and Administration Cabinet Construction Contract.

The Owner and Contractor agree as set forth below.

#### **Article No. 1 THE CONTRACT DOCUMENTS:**

The Contract Documents consist of the Agreement, the Official Bid Document, the Invitation to Bids, the Instructions to Bidders, the General Conditions, Supplement Conditions, Drawings, Specifications, and Addenda issued prior to the execution of this Agreement, and modifications made after the execution of this Agreement. The Contract Documents represent the entire and integrated agreement between the parties. All of these documents are as fully a part of this Agreement as if attached to this Agreement or repeated herein.

#### **Article No. 2 SCOPE OF WORK:**

The Contractor shall execute the entire work described in the Contract Documents entitled:

**INVITATION TO BID NO.** \_\_\_\_\_

**SOLICITATION NO.** \_\_\_\_\_

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A listing of the Specifications, Drawings and Addenda are contained in Article 11 of this Agreement

### **Article No. 3 TIME OF COMPLETION:**

The date of commencement for the work shall be the date upon which the Owner issues the Contract Documents. The Contractor shall achieve substantial completion of the entire work (as defined by Article 19.4 of the General Conditions) not later than \_\_\_\_\_ calendar days/date after the date of commencement for the work, subject to adjustments of contract time as provided in the Contract Documents. Final completion of the work shall be achieved \_\_\_\_\_ calendar days/date after the scheduled date of substantial completion.

### **Article No. 4 LIQUIDATED DAMAGES:**

It is understood by the parties that time is of the essence of this contract, and that the Owner will sustain substantial financial damages and other injuries in the event of a failure of the Contractor to complete the work in a timely manner. In light of these foreseeable losses, and the difficulty of proof of loss, the Contractor shall be assessed liquidated damages in the amount of \_\_\_\_\_ for each calendar day between the date set for substantial completion of this work and the actual date upon which substantial completion is achieved in accordance with Article 19.4 of the General Conditions. The Contractor shall be assessed liquidated damages in the amount of \_\_\_\_\_ for each calendar day between the date set for final completion of this work and the actual date upon which final completion is achieved in accordance with Article 19.5 of the General Conditions. In the event that the Contractor abandons the work prior to the substantial completion or is terminated for default under Article 22.2 of the General Conditions, the Owner may upon completion of the work recover either (1) liquidated damages for the entire period of delay to substantial completion or final completion under this Article, or (2) actual delay-related damages. This recovery will be in addition to any other rights and remedies the Owner may have against the Contractor.

### **Article No. 5 CONTRACT SUM:**

The Owner shall pay the Contractor for the Contractor's performance of the contract the sum of \_\_\_\_\_, (\_\_\_\_\_), subject to additions and deductions as provided in the Contract Documents. The Contract Sum is based upon the alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner.

**Article No. 6 PROGRESS PAYMENTS:**

Based upon applications for payment submitted to the Architect by the Contractor, the Owner shall make progress payments on the account of the Contract Sum to the Contractor in accordance with Article 18 of the General Conditions.

**Article No. 7 ACCEPTANCE AND FINAL PAYMENT:**

Final payment shall be due in accordance with Article 18.7 of the General Conditions provided, that all work has been fully completed in accordance with the plans and specifications as evidenced by a certificate by the Architect for the project, and it has been accepted by the Owner. Further, final payment is contingent upon receipt of "As-Built" drawings from the Contractor. The Contractor shall submit with his final payment application evidence satisfactory to the Architect that all payrolls, material bills and other indebtedness connected with the work have been paid or that provisions for the satisfaction thereof have been made.

**Article No. 8 CHANGES IN THE WORK:**

The Owner, without invalidated the contract, may delete, add to or modify the work in accordance with Article 14 of the General Conditions.

**Article No. 9 SPECIAL NOTICE REGARDING PAYROLL TAXES, ETC:**

The Contractor hereby certifies that he has fully informed himself of the conditions relating to construction and labor under which the work under this contract is to be performed, and accepts liability for payment of all payroll taxes on deductions required by local, state, and federal law, including but not limited to old age pension, social security, or annuities, and agrees that he shall employ, so far as is predictable, methods and means in carrying out his work as will not interfere with or interrupt the work of any other contractor working on or adjacent to the site for this work.

**Article 10 TERMINATION OR SUSPENSION:**

The contract may be terminated by the Owner upon the default of the Contractor and terminated for convenience of the Owner as provided for in Article 22 of the General Conditions.

**Article No. 11 ENUMERATION OF SPECIFICATIONS, DRAWINGS AND ADDENDA:**

The Contract Documents, except for Modifications issued after the execution of this Agreement, include the following specifications, drawings and addenda:

**SPECIFICATIONS:**

<b>DOCUMENT</b>	<b>TITLE</b>	<b>PAGES</b>

**DRAWINGS:**

<b>SHEET NUMBERS</b>

**ADDENDA:**

<b>NUMBERS</b>

PROJECT MANAGER: \_\_\_\_\_

AGENCY CONTACT: \_\_\_\_\_

ARCHITECT: \_\_\_\_\_

CONSULTANT: \_\_\_\_\_

Date for Substantial Completion: \_\_\_\_\_

Date for Final Completion: \_\_\_\_\_

## Contents

<u>Article</u>	<u>Title</u>
'1	<u>Special Conditions Supplement</u>
'2	<u>The Project</u>
'3	<u>Project Contacts</u>
'4	<u>Times for Completion</u>
'5	<u>Liquidated Damages</u>
'6	<u>Temporary Facilities and Controls</u>
'7	<u>Special Inspections and Testing</u>
'8	<u>Allowances</u>
'9	<u>Unit Prices</u>
'10	<u>Schedule of Additive Alternates</u>
'11	<u>Additional Project Completion or Close-out Requirements</u>
'12	<u>Special Project Site Security or Access Required</u>
'13	<u>Special Delegated Design Requirements</u>
'14	<u>Other Special Conditions of Contract</u>

## Articles

### **'1     Special Conditions:**

These Special Conditions are provided as a supplement to the General Conditions in the Specifications. Special Conditions will also supersede General Conditions where changes are necessary to coordinate with specific project requirements.

### **'2     The Project:**

These specifications and drawings accompanying them describe the work to be performed and materials to be furnished for the:

FFA – Cabins, Shop & Misc. Construction  
FFA Leadership Training Center  
Hardinsburg, Kentucky, Breckinridge County  
Account No.: 540-C97Q-FF19-00

### **Project Description:**

The project is to construct a new maintenance shop building and two new cabins at the FFA Leadership Training Camp in Hardinsburg, KY. The new shop building will be wood construction over concrete slab with a metal skin containing mostly unconditioned storage space used to house equipment and lawn-mowers for camp maintenance (approx. 2,639 SF) and containing a small, conditioned office area with a single toilet room. The area above the office will be for a storage mezzanine accessed by stairs in the storage area. The storage area will be serviced by two, manually-operated, 14'-0" wide, overhead, insulated, sectional garage doors. Lighting in the storage area will be high-bay LED lights and LED panel type lights in the office area. The building will have three-phase power to allow for welding activities. Two porches will be included - a covered front porch for personnel access and a



secured, rear porch for outside storage. The office will be conditioned by a PTAC unit. The concrete floors will be epoxy-shielded, walls in the office will be gypsum board with rubber base. Doors to be hollow metal panels and frames for exterior use.

The two cabins are to be 24'-0" x 36'-0" single-room building to house 10 bunk beds for campers located on the site of the demolished bath-house. The buildings will be wood framed on concrete slab with metal exterior skin and asphalt-shingled roofs. The floors will be epoxy-shielded, walls and ceilings will be finished with painted plywood panels. Lighting will be LED panel type lights, HVAC will be ductless split system with two ceiling cassettes in the cabin. Each bunk bed location will be provided with high and low outlets serving both beds. Cabins will have a single exterior door and 4 awning type windows.

### **'3 Project Contacts:**

**(Refer to Drawings for Company Addresses / Phone Numbers)**

**In the roles defined by the General Conditions as "Architect" and as used throughout the Contract Documents as the Architect of the work being constructed,, the following firm and its sub-consultants are working under separate contract with the Owner to provide the services under this role:**

<b><u>Architect:</u></b>	Company Name:	<u>WHITE   POLLARD architects, PLLC</u>
	Principal-In-Charge:	<u>Steven White, AIA, LEED AP</u>
	Project Manager:	<u>Kell Pollard, Assoc. AIA, LEED AP</u>
<b><u>Engineer/s:</u></b>	Company Name:	<u>Rampart Engineering</u>
	Principal-In-Charge:	<u>Jeffrey McBride, PE</u>
	Project Manager:	<u></u>
<b><u>Engineer/s:</u></b>	Company Name:	<u>TP Engineers</u>
	Principal-In-Charge:	<u>Tejas Pathak, PE, RCDD</u>
	Project Manager:	<u></u>

**In the roles defined by the General Conditions as "Owner" and as used throughout the Contract Documents as the Owner of the work being constructed, is the Commonwealth of Kentucky, acting through the Finance and Administration Cabinet, Department for Facilities Management and Support Services, Division of Engineering and Contract Administration. The Owner is solely represented by the following:**

<b><u>Owner:</u></b>	<b>Finance and Administration Cabinet</b>	
	<b>Facilities and Support Services</b>	
	<b>Division of Engineering and Contract Administration</b>	
	Project Manager:	<u>Carl Kratzer</u>
	Associate Director:	<u>Frieda Myers</u>
	Director:	<u>Jennifer Linton</u>

**In the role defined by General Conditions, "Agency or Using Agency", is a state government entity which utilizes the work being constructed. This agency is a client of the Owner and advises the Owner on matters related to the project. This Using Agency does not possess the legal authority of Owner:**

**Using Agency:****DMA – BLUEGRASS STATION**Project Manager: Josh MitchamDirector: Pamela Moore

In the roles defined by the General Conditions as “Commissioning Authority” and as used throughout the Contract Documents as the Commissioning Agent of the work being constructed,, the following firm is working under separate contract with the Owner to provide the services under this role:

**Commissioning Authority:** Company Name: NAPrincipal-In-Charge: NAProject Manager: NA

In the roles defined by the General Conditions as “Special Inspector” and as used throughout the Contract Documents as the firm performing Special Inspections as required by the Kentucky Building Code for the work being constructed,, the following firm is working under separate contract with the Owner to provide the services under this role:

**Special Inspector:** Company Name: NAPrincipal-In-Charge: NAProject Manager: NA**‘4 Times of Completion:**

Subject to the conditions of Article ‘16 – “Delays and Extension of Time” of the General Conditions, the work to be performed under this Contract shall be completed as follows:

**Substantial Completion** 120 Calendar Days from date of Executed Contract for Construction. **Article ‘19.4 of the General Conditions set forth specific requirements of the Commonwealth of Kentucky that are necessary to be fulfilled by the Contractor in order to be determined to have accomplished Substantial Completion by this date. Refer to Article ‘11 of these Special Conditions for additional requirements of this specific project required to accomplish Substantial Completion.**

**Final Completion** 30 Calendar Days beyond Substantial Completion. **Article ‘19.5 of the General Conditions set forth specific requirements of the Commonwealth of Kentucky that are necessary to be fulfilled by the Contractor in order to be determined to have accomplished Final Completion by this date. Refer to Article ‘11 of these Special Conditions for additional requirements of this specific project required to accomplish Final Completion.**

As indicated in Article ‘4 of the General Conditions, “Construction Schedule”, the following limitations of work times are set forth herein that are to be accounted for by the Contractor in scheduling and sequencing of the work:

**Work Restrictions and “Black-Out” Dates:** to be identified at Pre-Construction Conference.

**Project Phasing (Separate start and completion dates):** None

**Limitations on daily work times:** to be identified at Pre-Construction Conference.

**Work being Performed by the Owner or by Others:** N/A

**Products ordered by the Owner in Advance/ Anticipated Delivery Dates:** N/A

**Construction Contract Time required for Commissioning:** N/A

**Construction Contract Time required for Testing and Balancing:** 3 calendar days.

## **'5 Liquidated Damages / Damages from Untimely Performance:**

**In accordance with Article '19.7 of the General Conditions, the Contractor shall pay the Owner the following identified amount** for each and every calendar day of unexcused delay in achieving Substantial Completion and Final Completion beyond the date set for below for each:

**Substantial Completion Liquidated Damages** are \$ 500.00 /calendar day for each day beyond the established Date of Substantial Completion until the Actual Date of Substantial Completion is achieved. (See Article '19.4 of the General Conditions and Article '11 of these Special Conditions for requirements for Substantial Completion).

**Final Completion Liquidated Damages** are \$ 250.00 /calendar day for each day beyond the established Date of Final Completion until the Actual Date of Final Completion is achieved. (See Article '19.5 of the General Conditions and Article '11 of these Special Conditions for requirements for Final Completion).

## **'6 Contractor Provided Temporary Facilities and Controls:**

**Construction Office/Trailer:** Contractor trailer can be omitted for smaller projects and run through a temporary location in building.

**Staging / Parking:** to be identified at Pre-Construction Conference.

**Temporary Fencing and Signage:** N/A

**Portable Toilet Facilities:** are required and to be located within construction fencing.

**Utilities:** Contractor to coordinate with owner for hook-up of existing utilities where applicable

Water: Owner provided

Electric: Owner provided

## **'7 Special Inspections and Testing:**

**Article '12 of the General Conditions and the technical specifications of the Contract Documents define and establish the requirements and provisions for Inspection of the Work, Special Inspections performed by others working under separate contract with the Owner, and testing to be provided by the Contractor.**

**Structural Special Inspections and Testing:** N/A

**Site Special Inspections and Testing:** N/A

**Contractor Provided Testing:** N/A

**‘8 Allowances included in the Contract Amount:**

The Contractor is required by Article '30 of the General Conditions to include in the Contract Amount the following Allowances:

No allowances in Contract

Allowances shall include all necessary materials, costs of delivery, installation labor, tools and equipment necessary to provide the item or services indicated in the Allowance. When the item of work or service is completed, the Contract Amount is modified by Change Order to reconcile the Allowance with the actual cost of the item or service provided. The contractor's overhead, profit, insurance and bonds, and administrative costs are included in the prescribed markup permitted by Article '14 of the General Conditions "Changes in the Work" and are not to be included in the Allowance.

**‘9 Unit Prices established by the Form of Proposal:**

The Contractor is required at time of submitting a bid proposal for this work to provide specific Unit Prices that will be used to add or deduct those specific work items or services by an established unit of measure and the stated price per unit.

Unit prices include all necessary materials, costs of delivery, installation labor, tools and equipment necessary to provide the unit measured item. If a unit price is used in a change to the work by Change Order, the contractor's overhead, profit, insurance and bonds, and administrative costs are included in the prescribed markup permitted by Article '14 of the General Conditions "Changes in the Work" and are not to be included in the unit price.

No Unit Prices in Contract

**‘10 Schedule of Additive Alternates:**

The Bid Form of Proposal includes Additive Alternates that, if accepted by the Owner during review of bids, become a part of the Contract Amount. Additive Alternates are listed in the order which they will be considered and may be accepted by the Owner to be included in the base Contract of the Work. The following is the sequential listing and description of Additive Alternates:

No additive alternatives in Scope of Work.

Additive Alternates include all necessary materials, costs of delivery, installation labor, tools and equipment, contractor's overhead, profit, insurance and bonding, and administrative costs. All work necessary to provide the work described in the Additive Alternate is to be included.

**‘11 Additional Project Completion or Project Close-Out Required:**

**Article '19.4 of the General Conditions “Substantial Completion” defines the specific MANDATORY requirements to be accomplished or provided to achieve Substantial Completion of the Project. In addition to those requirements, the following requirements are also MANDATORY requirements to be accomplished or provided to achieve Substantial Completion of this Project:**

- Operation and Maintenance Manuals Composition as follows:
  - A. Provide one (1) hard copy of Operation and Maintenance Manual as well as one (1) digital copy on CD or jump-drive. A digital copy of the O&M Manual shall also be uploaded to eComm under Closeout Documents.
  - B. Organize Operation & Maintenance Manuals into an orderly sequence based on the table of contents of the Project Manual.
  - C. Bind Operation & Maintenance Manual in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation.
  - D. Identify binder on the front and spine with the typed or printed title "Operation & Maintenance Manuals," Project name, and name of Contractor.
  - E. Include one complete copy set of shop drawings in the Operations and Maintenance Manual

**Article '19.5 of the General Conditions “Final Completion” defines the specific MANDATORY requirements to be accomplished or provided to achieve Final Completion of the Project. In addition to those requirements, the following requirements are also MANDATORY requirements to be accomplished or provided to achieve Final Completion of this Project:**

- Warranty Binder Composition as follows:
  - A. Provide one (1) hard copy of the Warranty Manual as well as one (1) digital copy on CD or jump-drive. A digital copy of the Warranty Manual shall also be uploaded to eComm under Closeout Documents. Small Warranty binders can be included within Operation and Maintenance Manual. Their inclusion should be clearly indicated on the cover.
  - B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - C. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  - D. 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.

- E. Identify binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

## **'12 Special Project Site Security or Access Requirements:**

No Special Project Site Security or Access Requirements

## **'13 Special Delegated Design Requirements:**

No delegated design requirements in Scope of Work.

## **'14 Other Special Conditions of Contract:**

No additional requirements beyond those listed in the General Conditions of the Contract.

**END OF SPECIAL CONDITIONS**

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## SECTION 014100– STRUCTURAL SPECIAL INSPECTIONS

## PART 1 – GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Special inspections as defined in Section 1704 of The Kentucky Building Code are required.
- B. The Inspection Agency shall conduct inspections under the supervision of a qualified professional engineer licensed in the State of Kentucky (Special Inspector).
- C. Seismic Design Category for the structure is shown in the General Notes section of the structural drawings.
- D. Special inspections are required for the following materials and work:
  - 1. Inspection of Fabricators per Section 1704.2 of the Kentucky Building Code.
  - 2. Steel Construction per Section 1704.3 of the Kentucky Building Code.
  - 3. Concrete Construction per Section 1704.4 of the Kentucky Building Code.
  - 4. Prepared Fill per Section 1704.7 of the Kentucky Building Code.

## 1.3 SELECTION AND PAYMENT

- A. The Inspection Agency shall be EMPLOYED by the owner . The Inspection Agency will be responsible for providing all Structural Special Inspection (including testing as listed herein) – scope of work may not be broken into separate contracts with multiple firms.
- B. Special inspections are additional to testing and inspection requirements shown elsewhere in the specifications and on the drawings, which is to be paid for by the General Contractor and is not part of the SPECIAL INSPECTION services. The General Contractor shall also pay for additional structural testing and inspection required for his convenience. Inspection work not part of the Structural Special Inspections may be performed by an Inspection Agency of the Contractor's choosing, unless noted otherwise.

- C. Costs for reinspection and retesting, should discrepancies be found, will be paid for by the owner, as part of the Special Inspection Services, except where rework is due to negligence or omission deemed excessive by the Owner.
  - 1. In case of excessive rework, such retesting and reinspection shall be paid for by the General Contractor as an additional service of the Inspection Agency.
  - 2. In case of excessive waste/lost time of the Special Inspector due to inadequate scheduling by the General Contractor, such time shall be paid for by the General Contractor as an additional service of the Inspection Agency.

#### 1.4 QUALITY ASSURANCE

- A. Qualified Certification Authorities: Subject to compliance with Kentucky Building Code Requirements, Qualified Certification Authorities providing certification which may be applicable to Project include:
  - 1. American Concrete Institute (ACI).
  - 2. American Institute of Steel Construction (AISC).
  - 3. American Welding Society (AWS).
  - 4. National Institute of Certified Engineering Technology (NICET).
  - 5. Steel Joist Institute (SJI).
- B. Each inspector performing work on the Project shall be qualified to perform inspections for the particular type of construction or operation requiring special inspection by a Qualified Certification Authority as defined in the Kentucky Building Code. "Qualification" for purposes of this section shall mean a certified professional where certification in that jurisdiction exists. Subject to compliance with Kentucky Building Code requirements, Qualified Certification Authorities providing certification which may be applicable to Project include, but are not limited to, the following:
  - 1. Steel Construction
    - a. Material verifications, bolted connections, visual observation of welds – AWS Level 1.
    - b. Steel frame connection details – Professional Engineer licensed in the State of Kentucky with experience in the design of building structures.
  - 2. Concrete Construction
    - a. Use of design mix – ACI Level 2.
    - b. Material verifications, sampling of fresh concrete – NICET Level 1 (concrete).

- c. Reinforcing inspection – NICET Level 2 (concrete).
- 3. Soils and Rock Bearing Materials
  - a. NICET Level 2 (soils).
- C. Prior to any construction, Inspection Agency shall submit list of personnel who may provide inspection work on project. List shall include the name and certification level (qualification) of each inspector. List shall also include the name and professional engineering registration number of the Special Inspector and the Professional Engineer with experience in the design of building structures.
- D. The Inspection Agency shall carry professional liability insurance for errors and omissions to a minimum limit of \$1,000,000 per occurrence and shall submit certificate of insurance along with the qualifications to the Architect and Engineer.
- E. Special Inspector Qualifications: A professional engineer who is legally authorized to practice in the State of Kentucky and who is experienced in providing testing and inspection services of structure system types similar to this Project in material, design, and extent.

## PART 2 – EXECUTION

### 2.1 PROGRESS MEETINGS

- A. The Special Inspector shall attend any pre-construction meetings which may be conducted at the construction site by the Structural Engineer to discuss quality issues.
- B. The Special Inspector shall attend construction progress meetings which will be held at the construction site by the Architect, Engineer, and General Contractor.

### 2.2 CONTRACTOR'S RESPONSIBILITIES

- A. Coordinate with the Inspection Agency to provide inspection and testing services.
- B. Provide a complete copy all structural shop drawings to the Structural Testing/Inspection Agency.
- C. Arrange the preconstruction meeting to discuss quality issues.
- D. Notify the Structural Testing/Inspection Agency sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.

- E. Cooperate with Structural Testing/Inspection Agency and provide access, including equipment with operator, to work. Access equipment includes, but is not limited to, man lifts, excavation equipment, etc.
- F. Provide samples of materials to be tested in required quantities.
- G. Provide storage space for Structural Testing/Inspection Agency's exclusive use, such as for storing and curing concrete testing samples. If required by Special Inspector, General Contractor shall provide cure box with electricity, water, and blankets for curing concrete specimens.
- H. Provide labor to assist the Structural Testing/Inspection Agency in performing tests/inspections. Labor includes, but is not limited to, construction of masonry prisms, etc.
- I. Neither the observation of the Architect/Structural Engineer in the administration of the contract, nor tests/inspections by the Testing/Inspection Agency, nor approvals by persons other than the Architect/Structural Engineer shall relieve the Contractor from his obligation to perform the work in accordance with the Contract Documents.

## 2.3 SPECIAL INSPECTOR'S RESPONSIBILITIES

- A. Cooperate with the Contractor and provide timely service.
- B. Notify Contractor of minimum advance notice for each type of inspection/test.
- C. Upon arriving at the construction site, sign in and notify the Contractor of presence.
- D. Select the representative samples that are to be tested/inspected.
- E. Perform tests/inspections as outlined in Contract Documents, the applicable codes, and as directed by the Structural Engineer.
- F. Keep records of all inspections.
- G. Furnish inspection reports to the Architect, Structural Engineer, and General Contractor weekly as construction progresses.
- H. Inform General Contractor and / or Fabricator of all discrepancies immediately for correction.
  - 1. Document in writing correction of discrepancies.
  - 2. Highlight discrepancies within the report.

3. If discrepancies are not corrected, the discrepancies shall be brought to the attention of the Code Official and the Structural Engineer prior to the completion of that phase of the work.
- I. Leave copies of field notes with the Contractor prior to leaving the construction site. Field notes shall include the message given to the Contractor, date, time of message, name of Contractor's representative informed, type and location of work or materials tested/inspected, whether the work or materials complies with Contract Documents and name of the Structural Testing/Inspection Agency's representative.
- J. Immediately notify General Contractor, Architect, and Structural Engineer by separate letter if work yet to be inspected is found on site that is either being covered by other work or was to receive continuous inspection.
- K. Structural Testing/Inspection Agency shall not alter requirements of Contract Documents, approve or reject any portion of the work, or perform duties of the Contractor.
- L. Submit a final report of inspections documenting completion of all required Special Inspections and correction of any discrepancies noted in inspections to the Structural Engineer. Final report shall be prepared by, sealed, and signed by the Special Inspector and shall include a complete list of materials and work inspected during the course of the project.
  1. Submit one complete set of all special inspection reports to Structural Engineer of Record with final report of special inspections. Report set shall be bound, divided by construction type, and in chronological order.

## 2.4 INSPECTION OF FABRICATORS

- A. Inspect the fabrication of structural load-bearing members where such work is being performed on the premises of the Fabricator's shop.
  1. Fabricators shall be exempt from special inspection when a Qualified Certification Authority (as defined in section 1702 of The Kentucky Building Code) has periodically reviewed and approved Fabricator's written procedural and quality control manuals and fabrication practices. Subject to compliance with Kentucky Building Code requirements, Qualified Certification Authorities providing certification which may be applicable to Project include, but are not limited to, the following:
    - a. Structural Steel Fabricators – AISC or AWS certified.
    - b. Steel Joist Fabricators – SJI certified.

2. Fabricators exempt from special inspection shall submit a certificate of compliance to the structural engineer of record at the completion of fabrication stating that all work was completed in accordance with the approved construction documents.
- B. Verify that the Fabricator maintains and review for completeness Fabricator's detailed fabrication and quality control procedures which provide a basis for control of the workmanship and ability to conform to the approved construction documents and reference standards.
- C. Perform special inspections at Fabricator's shop as outlined in this specification for each type of construction.

## 2.5 INSPECTION OF STEEL CONSTRUCTION

- A. Provide special inspection of the fabrication of steel structural elements and assemblies in accordance with the Inspection of Fabricators.
- B. Verify that certification numbers on bolt, nut, and washer containers correspond to the identification numbers on mill test reports and that manufacturer's symbol and grade markings appear on all bolts and nuts. Also verify that bolts, nuts, and washers are being properly cared for at the site.
- C. Verify that identification markings on structural steel members conform to ASTM standards specified on the approved construction documents.
- D. Verify that identification markings on weld filler materials conform to ASTM standards specified on the approved construction documents. Also verify that weld filler material is being properly cared for.
- E. Test and inspect high-strength bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
  1. Perform periodic inspection of bearing type connections.
  2. Perform continuous inspection of slip-critical type connections.
  3. Verify that direct-tension indicator gaps comply with ASTM F 959, Table 2.
  4. Verify that twist-off-type tension-control assemblies have been properly tightened.
- F. Inspect and test welds during fabrication (where applicable) and erection of structural steel as follows:
  1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.

2. Inspect all weld procedures and welders according to the requirements of AWS D1.1-2000.
  3. Use non-destructive testing according to AWS D1.1-2000, Section 6.11, on all welds that appear to have excessive inclusions, porosities, cracks, and incomplete penetrations as described by AWS D1.1-2000, or have the questionable weld removed and rewelded.
  4. Perform continuous non-destructive testing according to AWS D1.1-2000, Section 6.11, on all complete penetration and/or partial penetration groove welds and on all splices of main members where those splices are required.
  5. Perform continuous inspection according to AWS D1.1-2000, Section 6.9 (visual inspection) on all multi-pass fillet welds and on all single-pass fillet welds larger than 5/16".
  6. Perform periodic inspection according to AWS D1.1-2000, Section 6.9 (visual inspection) on all single-pass fillet welds smaller than 5/16" and on all floor, form, and roof deck welds.
- G. Inspect all steel frame connection details for compliance with approved construction documents and approved steel erection shop drawings.
1. Verify completeness and construction of all bracing, stiffening, and connections.
  2. Verify location, completeness and accuracy of all members.

## 2.6 INSPECTION OF CONCRETE CONSTRUCTION

- A. Provide special inspection of the fabrication of concrete structural elements and assemblies in accordance with the Inspection of Fabricators.
- B. Periodically verify the use of the proper design mix.
- C. Verify use of proper grade and ASTM designation of reinforcing steels.
- D. Perform periodic inspection on placement, spacing, clear cover, number, and splice lap lengths of reinforcing steel.
- E. Monitor concrete quality by means of site and laboratory tests. The Inspection Agency is authorized to reject plastic concrete not conforming to specifications. Immediately inform the Contractor, the Architect and the Structural Engineer of inadequacies in concrete quality. Sampling and testing for quality control during concrete placement shall include the following:
  1. Sampling Fresh Concrete: ASTM C 172.

- a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
  - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
  - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
  - d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
  - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
  3. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
  4. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
  5. Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- F. Perform continuous inspection of concrete placement to verify proper application techniques.



- G. Perform periodic inspection of concrete curing procedures to verify maintenance of specified curing temperature, protection, and techniques.
- H. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- I. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

## 2.7 INSPECTION OF MASONRY CONSTRUCTION

- A. At onset of masonry construction and periodically thereafter, verify proportions of site-prepared mortar, construction of mortar joints, and location of reinforcement and connectors.
- B. Perform periodic inspection to verify size and location of structural elements; type, size, and location of anchors, including anchorage to other structural elements, frames, and construction; and specified size, grade, and type of reinforcement.
- C. Prior to each grouting operation, verify cleanliness of grout space, placement of all reinforcement and connectors, including lap splice lengths, and proportions of site-prepared grout.
- D. Perform continuous inspection of grout placement to verify compliance with contract document provisions.
- E. Perform periodic inspection of masonry curing procedures to verify maintenance of specified curing temperature, protection, and techniques.
- F. Sample and test grout compressive strength according to ASTM C 1019 and the following:
  - 1. Compression Test Sample: one set of three standard cube specimens for each compressive-strength test, unless otherwise directed. Mold and store cubes for laboratory-cured test specimens except when field-cured test specimens are required.
  - 2. Compressive-Strength Tests: one sample for each day's grouting; one specimen tested at 7 days, one specimen tested at 28 days, and one specimen retained in reserve for later testing if required.

## 2.8 INSPECTION OF SOILS

- A. Inspect the existing site soil conditions, fill placement, and load-bearing requirements for compliance with the recommendations of the approved geotechnical investigation report.
  - 1. Where the site is specified to be undercut by the geotechnical investigation report, verify all existing uncontrolled fills have been removed from below applicable foundation elements to the specified depth.
- B. Prior to placement of any engineered fill, determine that the site has been prepared in accordance with the recommendations of the approved geotechnical investigation report.
- C. During placement and compaction of the engineered fill material, verify that the material being used, maximum lift thickness, and in-place dry density comply with the recommendations of the approved geotechnical report.

END OF SECTION 014100

**SECTION 033000 - CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

- 1. Slabs-on-grade.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. 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."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
  2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specification for Structural Concrete,"
  2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures. Contractor shall pay for and coordinate this service.

## PART 2 - PRODUCTS

### 2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Plain-Steel Wire: ASTM A 82, galvanized.
- C. Deformed-Steel Wire: ASTM A 496.
- D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

### 2.2 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.

- B. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
- 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," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
  - 2. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

## 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I
- B. Normal-Weight Aggregates: ASTM C 33,
- C. Water: potable.

## 2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.

## 2.5 VAPOR RETARDERS

- A. Moisture Barrier: Provide moisture barrier cover over prepared base material for all slabs on grade. The moisture barrier is to be placed on the sub-grade and the crushed aggregate is to be placed on top of the moisture barrier. Use only materials which are resistant to decay when tested in accordance with ASTM E 154. as follows:
  - 1. Polyethylene sheet not less than 1.0 mil thick
- B. Chemical Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 lbs. of fluosilicates per gal.
- C. Adaptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. Per sq. yd., complying with AASHTO M 182, Class C. :

- D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof paper.
  2. Polyethylene film.
  3. Polyethylene-coated burlap.
- E. Liquid-Membrane-Forming Curing Compound: Federal spec TT-C-800, Type 1, unless otherwise acceptable to Architect.
1. Provide a curing compound compatible with floor sealers and floor finishes in areas scheduled to receive sealer and finishes. See Division 9 and room finish schedule for type of floor sealer or finish.
- F. Expansion Joint Material: Type F by Sonneborn or equal.

## 2.6 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.
1. If trial batch method used, use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
1. 4,000 psi 28-day compressive strength; 520 lbs. cement per cu. Yd. minimum, W/C ratio .46 maximum. Flyash substitution is only permitted in slabs on grade.
- D. Adjustment to concrete mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect before using in work. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.
- E. Admixtures

1. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within the following limits:
    - a. Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure: 3% - 7% for maximum  $\frac{3}{4}$ " aggregate
    - b. Other concrete: 2% - 4% air
- F. Slump limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps and sloping surfaces: Not more than 3"
  2. Reinforced foundation systems: Not less than 1" and not more than 4"
  3. Other Concrete: Not less than 1" and not more than 4" (6" -8" with plasticizer).

## 2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F (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.
  2. Delete references which allow additional water to be added to the mix at jobsite for insufficient slump. Additional water will not be allowed.

## PART 3 - EXECUTION

### 3.1 FORMWORK

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

- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
  - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
  - 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

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



1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
  1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
  2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.4 VAPOR RETARDERS

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

### 3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

### 3.6 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.
  1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. 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.
  2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will 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.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
  2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.
- 3.7 CONCRETE PLACEMENT
- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
  - B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.8 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.
- 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.
  2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
  3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of

bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

- 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.

### 3.9 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.

### 3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

### 3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply

according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. 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 the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. 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 with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  - 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.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing

compound will not interfere with bonding of floor covering used on Project.

4. 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.

### 3.12 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor to retain a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
  2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) 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.
  3. 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.
  4. Air Content: ASTM C 173. volumetric method for light-weight or normal weight concrete; ASTM C231 pressure for normal weight concrete; one for each set of compressive strength test specimens..
  5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
  6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  7. Compression Test Specimens: ASTM C 31/C 31M.



- a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
  - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
8. 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. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
  - b. 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.
9. 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.
10. 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 (3.4 MPa).
11. Test results shall be reported in writing to Architect, Owner, 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.
12. 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.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

**END OF SECTION 033000**

**SECTION 061000 - ROUGH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Framing with dimension lumber.
  - 2. Framing with engineered wood products.
  - 3. Wood blocking and nailers.
  - 4. Sheathing.
  - 5. Plywood backing panels.
- B. Related Sections include the following:
  - 1. Division 6 Section "Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.

**1.3 DEFINITIONS**

- A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

**PART 2 - PRODUCTS****2.1 LUMBER, GENERAL**

- A. Lumber Standards: Furnish lumber manufactured to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:
  - 1. SPIB - Southern Pine Inspection Bureau.
  - 2. APA - American Plywood Association

- C. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
1. Provide dressed lumber, S4S, unless otherwise indicated.
  2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

## 2.2 WOOD PRODUCTS, GENERAL

Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.
5. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

6. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

## 2.3 DIMENSION LUMBER

- A. For structural light framing (2 to 4 inches thick, 2 to 4 inches wide), provide the following grade and species:
1. "No. 2" grade.
- B. For structural framing (2 to 4 inches thick, 5 inches and wider), provide the following grade and species:

1. "No. 2" grade.

## 2.4 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
  - B. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
  - C. Grade: "Standard" grade light-framing-size lumber of any species or board-size lumber as required. "No. 3 Common" or "Standard" grade boards per WCLIB or WWPA rules or "No. 2 Boards" per SPIB rules.
7. 2.4

## 2.5 CONSTRUCTION PANELS, GENERAL

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108.
- B. Trademark: Furnish construction panels that are each factory-marked with APA trademark evidencing compliance with grade requirements.

## 2.6 SHEATHING

- A. Span Rating: 24" oc
- B. Thickness: 3/4".

## 2.10 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, A-C, 3/4" thickness.

## 2.7 FASTENERS & FRAMING ANCHORS

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

- C. Power Driven Fasteners: National Evaluation Report NER-272.
- D. Wood Screws: ANSI B18.6.1.
- E. Lag Bolts: ANSI B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.
- G. Roof Truss Clips: Simpson Strong-Tie, Model STC or equal.
- H. Twist Straps (Hurricane anchors): Simpson Strong-Tie Model MTS or equal.

## 2.8 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS

- A. General: Where lumber or plywood is indicated as preservative-treated wood or is specified herein to be treated, comply with applicable requirements of AWP Standards C2 (Lumber) and C9 (Plywood). Mark each treated item with the AWPB or SPIB Quality Mark Requirements.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.
- B. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- C. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

### 3.2 WOOD FRAMING INSTALLATION, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Do not splice structural members between supports.
- D. Where built-up beams or girders of 2-inch nominal- (38-mm actual-) dimension lumber on edge are required, fasten together with 2 rows of 20d (100-mm) nails spaced not less than 32 inches (812 mm) o.c. Locate one row near top edge and other near bottom edge.

### 3.3 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
  - 1. Fastening Methods: Fasten panels as indicated below:
    - 9. Sheathing:
      - a. Nail to wood framing.
      - b. Screw to cold-formed metal framing.
      - c. Space panels 1/8 inch (3 mm) apart at edges and ends.
    - 10. Plywood Backing Panels: Nail or screw to supports.

### 3.4 INSTALLATION OF CONSTRUCTION PANELS

- A. General: Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Plywood Backing Panels: Screw to supports.

**END OF SECTION 061000**

**SECTION 061760 - METAL-PLATE-CONNECTED WOOD TRUSSES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes wood roof trusses and truss accessories to be used the Shop Building and the two Cabins. See roof plans for configurations.
- B. Related Sections include the following:
  - 1. Division 6 Section "Rough Carpentry" for roof sheathing and subflooring and dimension lumber for supplementary framing and permanent bracing.
  - 2. Division 13 Section "Pole-Framed Building Systems"

**1.3 DEFINITIONS**

- A. Metal-Plate-Connected Wood Trusses: Planar structural units consisting of metal-plate-connected members fabricated from dimension lumber and cut and assembled before delivery to Project site.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NELMA - Northeastern Lumber Manufacturers Association.
  - 2. NLGA - National Lumber Grades Authority.
  - 3. SPIB - Southern Pine Inspection Bureau.
  - 4. WCLIB - West Coast Lumber Inspection Bureau.
  - 5. WWPA - Western Wood Products Association.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Provide metal-plate-connected wood trusses capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated.
  - 2. Maximum Deflection Under Design Loads:



- a. Roof Trusses: Vertical deflection of **1/240** of span.
- b. Roof Trusses: Horizontal deflection at reactions of 0.5 inches.

## 1.5 SUBMITTALS

- A. Product Data: For metal-plate connectors, metal framing anchors, bolts, and fasteners.
- B. Shop Drawings: Show location, pitch, span, camber, configuration, and spacing for each type of truss required; species, sizes, and stress grades of lumber; splice details; type, size, material, finish, design values, orientation, and location of metal connector plates; and bearing details. All shop drawings, calculations and erection plans shall bear the seal of the licensed professional engineer licensed to practice in Kentucky, responsible for the design of the trusses. Truss shop drawings (signed and sealed) shall be submitted to H.B.C. (by General Contractor).
  1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  2. Show design loadings for each truss type.
  3. Show all bracing and/or bridging on erection plan as required to prevent compression buckling of individual truss members.
  4. Submit erection plans showing the truss layout, proper handling and erection instructions along with all temporary and permanent bracing or bridging requirements.
- C. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss fabricating firm.
- D. Qualification Data: For metal-plate manufacturer/fabricator and Installer.
- E. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.
- F. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:
  1. Metal-plate connectors.
  2. Metal framing anchors.

## 1.6 QUALITY ASSURANCE

- A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with TPI quality-control procedures for manufacture of connector plates published in TPI 1.
  - 1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
  - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer, licensed to practice in the state the project is located.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program that involves inspection by SPIB, Timber Products Inspection, TPI, or other independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.
- C. Source Limitations for Connector Plates: Obtain metal connector plates through one source from a single manufacturer.
- D. 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 HIB, "Commentary and Recommendations for Handling, Installing & Bracing Metal Plate Connected Wood Trusses."
- E. Wood Structural Design Standard: Comply with applicable requirements in AFPA's "National Design Specifications for Wood Construction" and its "Supplement."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with TPI recommendations to avoid damage and lateral bending. Provide for air circulation around stacks and under coverings.
- B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

## 1.8 COORDINATION

- A. Time delivery and erection of trusses to avoid extended on-site storage and to avoid delaying progress of other trades whose work must follow erection of trusses.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Metal Connector Plates:
    - a. Alpine Engineered Products, Inc.
    - b. CompuTrus, Inc.
    - c. Eagle Metal Products.
    - d. Jager Industries, Inc.
    - e. Mitek Industries, Inc.
    - f. Robbins Engineering, Inc.
    - g. TEE-LOK Corporation.
    - h. Truswal Systems Corporation.
  - 2. Metal Framing Anchors:
    - a. Alpine Engineered Products, Inc.
    - b. Cleveland Steel Specialty Co.
    - c. Harlen Metal Products, Inc.
    - d. KC Metals Products, Inc.
    - e. Silver Metal Products, Inc.
    - f. Simpson Strong-Tie Company, Inc.
    - g. Southeastern Metals Manufacturing Co., Inc.
    - h. United Steel Products Company, Inc.

## 2.2 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Provide dressed lumber, S4S, manufactured to actual sizes required by DOC PS 20 for moisture content specified.
  - 3. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
  - 4. Provide dry lumber with no less than 7 percent moisture content at time of dressing.

- B. Grade and Species: Provide dimension lumber of any species for truss chord and web members, graded visually or mechanically, and capable of supporting required loads without exceeding allowable design values according to AFPA's "National Design Specifications for Wood Construction" and its "Supplement."
- C. Grade and Species: Provide visually graded dimension lumber for truss chord and web members, of the following grade and any of the following species:
1. Grade for Chord Members: No. 2 or better.
  2. Grade for Web Members: No. 2 or better
  3. Species: Southern pine; SPIB.
  4. Species: Mixed southern pine; SPIB.
- D. Grade and Species: Provide dimension lumber of any species for truss chord and web members, graded as follows and of the following minimum design values for size of member required according to AFPA's "National Design Specifications for Wood Construction" and its "Supplement":
1. Grading Method: mechanical.
  2. Design Values: Modulus of elasticity of at least 1,500,000 psi and an extreme fiber stress in bending of at 1200 psi .
- E. Kiln-dry material 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.
- F. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

## 2.3 METAL CONNECTOR PLATES

- A. General: Fabricate connector plates to comply with TPI 1 from metal complying with requirements indicated below:
- B. Hot-Dip Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180) coating designation; Designation SS, Grade 33, and not less than 0.036 inch (0.9 mm) thick.
- C. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591/A 591M, 80Z (24G) coating designation; ASTM A 570/A 570M, Structural Steel (SS), Grade 33, and not less than 0.047 inch (1.2 mm) thick.
- D. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZ150) coating designation; Structural Steel (SS), Grade 33, and not less than 0.036 inch (0.9 mm) thick.

- E. Stainless-Steel Sheet: ASTM A 666, Type 304, and not less than 0.035 inch (0.88 mm) thick.

## 2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  - 1. Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

## 2.5 METAL FRAMING ANCHORS

- A. General: Provide framing anchors made from metal indicated, of structural capacity, type, and size indicated, and as follows:
  - 1. Research/Evaluation Reports: Provide products acceptable to authorities having jurisdiction and for which model code research/evaluation reports exist that show compliance of metal framing anchors, for application indicated, with building code in effect for Project.
  - 2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data

or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
- C. Stainless-Steel Sheet: ASTM A 666, Type 304.
  - 1. Use for exterior locations and where indicated.
- D. Truss Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening roof trusses to wall studs below, 2-1/2 inches (63 mm) wide by 0.062 inch (1.6 mm) thick. Tie fits over top of truss and fastens to both sides of truss, inside face of top plates, and both sides of stud below.
- E. Roof Truss Clips: Angle clips for bracing bottom chord of roof trusses at non-load-bearing walls, 1-1/4 inches (32 mm) wide by 0.050 inch (1.3 mm) thick. Clip is fastened to truss through slotted holes to allow for truss deflection.
- F. Floor Truss Hangers: U-shaped hangers, full depth of floor truss, with 1-3/4-inch- (44-mm-) long seat; formed from metal strap 0.062 inch (1.6 mm) thick with tabs bent to extend over and be fastened to supporting member.

## 2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

## 2.7 FABRICATION

- A. Cut truss members to accurate lengths, angles, and sizes to produce close-fitting joints.
- B. Fabricate metal connector plates to sizes, configurations, thicknesses, and anchorage details required to withstand design loads for types of joint designs indicated.
- C. 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.
- D. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. Before installing, splice trusses delivered to Project site in more than one piece.
- 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. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- F. Space trusses **24 inches** o.c. (max.); adjust and align trusses in location before permanently fastening.
- G. Anchor trusses securely at bearing points; use metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.
- H. Securely connect each truss ply required for forming built-up girder trusses.
  - 1. Anchor trusses to girder trusses as indicated.
- I. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
  - 1. Install and fasten strongback bracing vertically against vertical web of parallel-chord floor trusses at centers indicated.
- J. Install wood trusses within installation tolerances in TPI 1.
- K. Do not cut or remove truss members.
- L. Replace wood trusses that are damaged or do not meet requirements.
  - 1. Do not alter trusses in field.

## 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.

- B. Protective Coating: Clean and prepare exposed surfaces of metal connector plates. Brush apply primer, when part of coating system, and one coat of protective coating.
1. Apply materials to provide minimum dry film thickness recommended by coating system manufacturer.

END OF SECTION 061760



**SECTION 062000 - FINISH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Interior plywood wall & ceiling panels.
  - 2. Interior standing and running trim.

**1.3 SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Include construction details, material descriptions, dimensions of individual components and profiles, textures, and colors.
- B. Samples for Verification:
  - 1. 12" long sample of product.

**PART 2 - PRODUCTS****2.1 INTERIOR PLYWOOD WALL & CEILING PANELS**

- A. Provide premium grade, smoothly sanded, white A-C faced, primed and ready to use on interior walls & ceilings of cabins:
  - 1. Provide Blondewood by Top Choice or equal. Provide primed product for interior non-structural use in ½" thk x 4'-0" x 8'-0" (Actual: 0.453" x 3.997' x 7.997'). Edge profile: square. Veneer grade: B-2. Wood species: Whitewood (softwood).

**2.2 INTERIOR TRIMS**

- A. Provide the following product materials:

1. Batten Trim: Provide primed 1x3, clear, knot free, premium pine trim boards by Weyerhaeuser or equal. Kiln dried and square edged. Appearance grade, S4S Dressing. Finger jointed material is acceptable. Actual size:  $\frac{3}{4}$ " x  $2\frac{1}{2}$ " x 8'-0" (walls), 12'-0", 16'-0".
2. Window/Door Trim: Provide primed 1x4, clear, knot free, premium pine trim boards by Weyerhaeuser or equal. Kiln dried and square edged. Appearance grade, S4S Dressing. Finger jointed material is acceptable. Actual size:  $\frac{3}{4}$ " x  $3\frac{1}{2}$ " x 8'-0"
3. Base Trim: Provide primed  $\frac{5}{4}$  x 6, clear, knot free, premium pine trim boards by Weyerhaeuser or equal. Kiln dried and square edged. Appearance grade, S4S Dressing. Finger jointed material is acceptable. Actual size:  $1\frac{1}{4}$ " x  $5\frac{1}{2}$ " x 16'-0"

### 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Provide brad nails or finish nails of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches (38 mm) into substrate, unless otherwise recommended by manufacturer:
  1. Galvanized or aluminum.
  2. All holes from fasteners shall be filled and sanded smooth prior to paint finish.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime product for exterior applications to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 9 Section "Painting."

### 3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

- B. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
  3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
  4. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate finish carpentry.

### 3.4 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

### 3.5 ADJUSTING

- A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

END OF SECTION 062000

**SECTION 072100 - THERMAL INSULATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Foil-faced glass-fiber batt insulation (above ceiling).
  - 2. Kraft-faced glass-fiber batt insulation (perimeter stud walls at cabins).
  - 3. Rigid foam insulation (exterior perimeter walls indicated at Shop Building [Office space only] and Cabins).

**1.3 DEFINITIONS**

- A. Thermal Resistivity: Where the thermal resistivity of insulation products are designated by "r-values," they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

**1.4 SUBMITTALS**

- A. Product data for each type of insulation product specified.

**1.5 QUALITY ASSURANCE**

- A. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.
  - 1. Surface Burning Characteristic: ASTM E 84.

2. Fire Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

## PART 2 - PRODUCTS

### 2.1 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.

1. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.

### 2.2 GLASS-FIBER BLANKET INSULATION

- A. Foil-faced, Glass-Fiber Thermal Batt Insulation: ASTM C 665, Type I (blankets with membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 75 and 150, respectively; passing ASTM E 136 for combustion characteristics.
1. Cabins: 24" wide X 48" x 12" thk, R-38.0, for use above ceiling at each Cabin. Provide Eco-touch thermal batt insulation by Owens Corning or equal.
  2. Shop Building: 15.5" wide X 48" x 10 1/4" thk, R-38.0, for use above ceiling at each Cabin. Provide Eco-touch thermal batt insulation by Owens Corning or equal.
- B. Kraft-faced, Glass-Fiber Thermal Batt Insulation: ASTM C 665, Type I (blankets with membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of N/R and N/R, respectively; passing ASTM E 136 for combustion characteristics.
1. At 2 x 4 wood stud walls: 15" wide x 93" x 3 1/2" thk, R-13.0, for use in perimeter metal stud walls indicated (see plan). Provide Eco-touch thermal batt insulation by Owens Corning or equal.
  2. At 2 x 6 wood stud walls: 15" wide x 93" x 5 1/2" thk, R-21.0, for use in perimeter metal stud walls indicated (see plan). Provide Eco-touch thermal batt insulation by Owens Corning or equal.
- C. Rigid Foam Insulation: ASTM C 518; with maximum flame-spread and smoke-developed indexes of 5 and 45, respectively; passing ASTM E 84 for combustion characteristics. 48" wide x 96" long x 1 1/2" thk, R-7.5. All joints shall sealed with tape to prevent air leakage.
1. At Shop Building for use on exterior & interior side of perimeter stud walls of Office & Toilet. Provide Foamular 150 rigid foam insulation by Owens Corning or equal. All joints shall sealed with tape to prevent air leakage.

2. At SAs for use on exterior side of perimeter stud walls. Provide Foamular 150 rigid foam insulation by Owens Corning or equal. All joints shall sealed with tape to prevent air leakage.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

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

#### **3.2 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturer's instructions applicable to products and application indicated. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation.
- B. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

#### **3.3 INSTALLATION OF GENERAL BUILDING INSULATION**

- D. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

#### **3.4 INSTALLATION OF VAPOR RETARDERS**

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder 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 not less than 2 wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16 inches o.c.
- C. Seal overlapping joints in vapor retarders with adhesives or tape per vapor retarder manufacturer's printed directions. Seal butt joints and fastener penetrations with tape of type recommended by vapor retarder manufacturer. Locate all joints over framing members or other solid substrates.

### 3.5 PROTECTION

- A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

**SECTION 072600 -UNDER-SLAB VAPOR RETARDER****PART 1 – GENERAL****1.1 SUMMARY**

- A. Products supplied under this section:
  - 1. Vapor retarder, seam tape, and mastic for installation under concrete slabs.
- B. Related sections:
  - 1. Section 03 Cast-in-Place Concrete

**1.2 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
  - 2. ASTM E 154-99 (2005) Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
  - 3. ASTM E 96-05 Standard Test Methods for Water Vapor Transmission of Materials.
  - 4. ASTM F 1249-06 Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
  - 5. ASTM E 1643-09 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. American Concrete Institute (ACI):
  - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

**1.3 SUBMITTALS**

- A. Quality control/assurance:
  - 1. Summary of test results as per paragraph 8.3 of ASTM E 1745.
  - 2. Manufacturer's samples, literature.
  - 3. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.

**PART 2 – PRODUCTS****2.1 MATERIALS**

- A. Vapor retarder must have all of the following qualities:



1. Permeance as tested before and after mandatory conditioning (ASTM E 1745 Section 7.1 and sub-paragraphs 7.1.1 - 7.1.5): less than 0.1 Perms [grains/(ft<sup>2</sup> · hr · inHg)].
  2. Other performance criteria:
    - a. Strength: ASTM E 1745 Class A.
- B. Provide one of the following Vapor retarder products:
1. Stego Industries, LLC; Stego Wrap, 15 mil Class A
  2. Carlisle Coatings & Waterproofing, Inc.; Blackline 400
  3. Fortifiber Corporation; Moistop Ultra 15
  4. Grace Construction Products, W. R. Grace & Company; Florprufe 120
  5. Insulation Solutions, Inc; Viper Vaporcheck 16
  6. Raven Industries, Inc.; Vapor Block 15
  7. W. R. Meadows, Inc. ; Perminator 15 mil

## 2.2 ACCESSORIES

- A. Vapor Retarding Seam tape must have the following qualities:
1. Water Vapor Transmission Rate less than or equal to 0.3 perms as tested by ASTM E96
- B. Vapor Proofing Mastic must have the following qualities:
1. Water Vapor Transmission Rate less than or equal to 0.3 perms as tested by ASTM E96.
- C. Pipe Boots must be constructed from vapor retarder material, pressure sensitive tape and/or mastic per vapor barrier system manufacture's instructions.

## PART 3 – EXECUTION

### 3.1 PREPARATION

- A. Ensure that subsoil is approved by Engineer or Special Inspector.
1. Level and compact base material.

### 3.2 INSTALLATION

- A. Install vapor retarder in accordance with manufacturer's instructions and ASTM E 1643.
1. Unroll vapor retarder with the longest dimension parallel with the direction of the concrete placement.
  2. Lap vapor retarder over footings and/or seal to foundation walls.
  3. Overlap joints 6 inches and seal with manufacturer's tape.

4. Seal all penetrations (including pipes) per manufacturer's instructions.
5. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
6. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape.

END OF SECTION 072600

**SECTION 073113 - ASPHALT SHINGLES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Related Sections include the following:

- 1. Division 7 Section "Flashing and Sheet Metal." for drip edge and other miscellaneous metal trims

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.
- C. Samples for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingles, soffit vent, and peak vent indicated.
  - 2. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For the following products, of sizes indicated, to verify color selected.
  - 1. Asphalt Shingle: Full-size asphalt shingle strip.
  - 2. Ridge and Hip Cap Shingles: Full-size ridge and hip cap asphalt shingle.

**1.4 WARRANTY**

- A. General Warranty: Shingle manufacturer's standard warranty for shingle specified.

**PART 2 - PRODUCTS**

## 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles (Dimensional): ASTM D 3462, laminated, multiply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by available manufacturers offering products that may be incorporated into the Work include, but are **not limited to**, the following]:
    - a. Atlas Roofing Corporation.
    - b. CertainTeed Corporation.
    - c. Elk Premium Building Products, Inc.; an ElkCorp company.
    - d. Emco Building Products Corp.
    - e. GAF Materials Corporation.
    - f. IKO.
    - g. Malarkey Roofing Products.
    - h. Owens Corning.
    - i. PABCO Roofing Products.
    - j. TAMKO Roofing Products, Inc.
  - 2. Butt Edge: Crenelated cut.
  - 3. Strip Size: Manufacturer's standard.
  - 4. Algae Resistance: Granules treated to resist algae discoloration.
  - 5. Color and Blends: As selected by Architect from manufacturer's full range.

## 2.4 ACCESSORIES

- A. Felt Underlayment: Type I, 36-inch- (914-mm-) wide, asphalt-saturated organic felt, complying with ASTM D 226 (No. 15) or ASTM D 4869.
- B. Nails: Aluminum or hot-dip galvanized steel, 0.120-inch- (3-mm-) diameter barbed shank, sharp-pointed, conventional roofing nails with a minimum 3/8-inch- (9.5-mm-) diameter head and of sufficient length to penetrate 3/4 inch (19 mm) into solid decking or at least 1/8 inch (3 mm) through plywood sheathing.
  - 1. Where nails are in contact with flashing, prevent galvanic action by providing nails made from the same metal as that of the flashing.
- C. Shingle-over ridge vent: Provide and install the following:
  - 1. Provide OmniRidge OR-4 (continuous) in 4' section lengths by Lomanco, Inc., or equal.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Coordinate installation with flashings and other adjoining work to ensure proper sequencing. Do not install roofing materials until all vent stacks and other penetrations through roof sheathing have been installed and are securely fastened against movement.

### 3.2 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations but not less than those recommended by ARMA's "Residential Asphalt Roofing Manual" or "The NRCA Steep Roofing Manual."
  - 1. Fasten asphalt shingles to roof sheathing with nails.
- B. Felt Underlayment: Apply 1 layer of felt underlayment horizontally over entire surface to receive asphalt shingles, lapping succeeding courses a minimum of 2 inches (50 mm), end laps a minimum of 4 inches (100 mm), and hips and valleys a minimum of 6 inches (150 mm). Fasten felt with sufficient number of roofing nails or noncorrosive staples to hold underlayment in place until asphalt shingle installation.
- C. Flashing: Install metal flashing and trim as indicated and according to details and recommendations of the "Asphalt Roofing" section of "The NRCA Steep Roofing Manual" and ARMA's "Residential Asphalt Roofing Manual."
- D. Install asphalt shingles, beginning at roof's lower edge, with a starter strip of roll roofing or inverted asphalt shingles with tabs removed. Fasten asphalt shingles in the desired weather exposure pattern; use number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines to ensure straight coursing.
  - 1. Cut and fit asphalt shingles at valleys, ridges, and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap asphalt shingles at ridges to shed water away from direction of prevailing wind.
  - 2. Pattern: 1/2 shingle spacing offset at succeeding courses.

### 3.3 ADJUSTING

- A. Replace any damaged materials installed under this Section with new materials that meet specified requirements.

## END OF SECTION 073113

**SECTION 076200 - SHEET METAL FLASHING AND TRIM****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes sheet metal flashing and trim in the following categories:
  - 1. Metal flashing.
  - 2. Breakmetal trim

**1.3 PERFORMANCE REQUIREMENTS**

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

**1.4 SUBMITTALS**

- A. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.
- B. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.
- C. Samples of sheet metal flashing, trim, and accessory items, in the specified finish.

**1.5 QUALITY ASSURANCE**

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

**PART 2 - PRODUCTS****2.1 METALS**

- B. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:
  - 1. Factory-Painted Aluminum Sheet: ASTM B 209 (ASTM B 209M), 3003-H14, with a minimum thickness of 0.040 inch (1.0 mm), unless otherwise indicated.

## 2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Burning Rod for Lead: Same composition as lead sheet.
- B. Solder: ASTM B 32, Grade Sn50, used with rosin flux.
- C. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.
- D. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.
- E. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- F. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."
- G. Epoxy Seam Sealer: 2-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.
- H. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
- I. Paper Slip Sheet: 5-lb/square (0.244 kg/sq. m) red rosin, sized building paper conforming to FS UU-B-790, Type I, Style 1b.
- J. Polyethylene Underlayment: ASTM D 4397, minimum 6-mil- (0.15-mm-) thick black polyethylene film, resistant to decay when tested according to ASTM E 154.
- K. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
- L. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

## 2.3 FABRICATION, GENERAL

- A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

- B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.
- D. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- E. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- F. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- H. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- I. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- J. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.
  - 1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

## 2.4 SHEET METAL FABRICATIONS

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- A. Gutters: Fabricate from the following material:



1. Aluminum: .063" Pre-finished
- B. Downspouts: Fabricate from the following material:
  1. Aluminum: 0.0320 inch (0.8 mm) thick. (prefinished)
- C. Drip Edges: Fabricate from the following material:
  1. Aluminum: 0.0320 inch (0.8 mm) thick. (prefinished)
- D. Copings: Fabricate from the following material:
  1. Aluminum: .063" Pre-finished
- E. Break metal Trims: Fabricate from the following material:
  1. Aluminum: .063" Pre-finished
- F. Soffit Trims: Fabricate from the following material:
  1. Aluminum: .063" Pre-finished

## 2.6 ALUMINUM EXTRUSION FABRICATIONS

- A. Aluminum Extrusion Units: Fabricate extruded-aluminum running units with formed or extruded-aluminum joint covers for installation behind main members where possible. Fabricate mitered and welded corner units.

## 2.7 ALUMINUM FINISHES

- A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.
- B. High-Performance Organic Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.
  1. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
    - a. Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.

- C. Shop Finish, Rain Drainage: Provide manufacturer's standard baked-on finish on sheet metal rain-drainage units (gutters, downspouts, and similar exposed units); 1.0-mil (0.025-mm) dry film thickness.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

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

#### **3.2 INSTALLATION**

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- C. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.
- D. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).
- E. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.
  - 1. Do not solder the following metals:
    - a. Aluminum.
    - b. Coil-coated galvanized steel sheet.
  - 2. Pretinning is not required for the following metals:

- a. Lead.
  - b. Lead-coated copper.
  - c. Terne-coated stainless steel.
3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.
  1. Use joint adhesive for nonmoving joints specified not to be soldered.
- G. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- H. Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- I. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
  1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.
  2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.
- J. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain flashing installation with roof-drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.
- K. Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:
  1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
  2. Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

### 3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

- B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 076200

**SECTION 079200 - JOINT SEALANTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes joint sealants for the following locations:
  - 1. Exterior joints in horizontal traffic surfaces as indicated below:
    - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    - b. Joints between different materials.
    - c. Other joints as indicated.
  - 2. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Perimeter joints between interior wall surfaces and frames of interior doors, and windows.
    - d. Perimeter joints of toilet fixtures.
    - e. Other joints as indicated.
  - 3. Interior joints in horizontal traffic surfaces as indicated below:
    - a. Control and expansion joints in tile flooring.
    - b. Other joints as indicated.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 8 "Glass and Glazing" for sealants used in glazing.
  - 2. Division 9 Section "Gypsum Drywall" for sealing concealed perimeter joints of gypsum board partitions to reduce sound transmission.

**1.3 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General Performance: Joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application.

Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.

- B. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- C. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

#### 1.4 SUBMITTALS

- A. Product data from manufacturers for each joint sealant product required.
- B. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- C. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
- B. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
  - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
  - 3. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS, GENERAL**

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
  - 1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

### **2.2 ELASTOMERIC JOINT SEALANTS**

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.

### **2.3 LATEX JOINT SEALANTS**

- A. General: Provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
- B. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
- C. Silicone Emulsion Sealant: Provide product complying with ASTM C 834 and, except for weight loss measured per ASTM C 792, with ASTM C 920 that accommodates joint movement of not more than 25 percent in both extension and compression for a total of 50 percent.

### **2.4 ACOUSTICAL JOINT SEALANTS**

- A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.
  2. Product has flame spread and smoke developed ratings of less than 25 per ASTM E 84.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

## 2.5 TAPE SEALANTS

- A. Tape Sealant: Manufacturer's standard, solvent-free, butyl-based tape sealant with a solids content of 100 percent formulated to be nonstaining, paintable, and nonmigrating in contact with nonporous surfaces with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.

## 2.6 PREFORMED FOAM SEALANTS

- A. Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
1. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other joint sealants.
  2. Impregnating Agent: Manufacturer's standard.
  3. Density: Manufacturer's standard.
  4. Backing: None.

## 2.7 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:



1. Open-cell polyurethane foam.
  2. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
  3. Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.
  4. Any material indicated above.
- C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.8 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, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  3. Remove laitance and form release agents from concrete.
  4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint fillers.
    - b. Do not stretch, twist, puncture, or tear joint fillers.
    - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
  2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.
- E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
  2. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
    - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
  3. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
- G. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

### 3.4 CLEANING

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

### 3.5 PROTECTION

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

### 3.6 ELASTOMERIC SEALANT DATA SHEET

#### 3.7 ELASTOMERIC JOINT SEALANTS

##### A. INTERIOR AND EXTERIOR HORIZONTAL CONCRETE APPLICATIONS

1. Two-component polyurethane sealant: Polyurethane-based, elastomeric sealant; FS TT-S-00227E, Class A, Type I (self-leveling) recommended by manufacturer for application shown.
  - a. Provide Sonalistic Paving Joint Sealer by Sonneborn

##### B. EXTERIOR BUILDING APPLICATIONS EXCEPT SHEET METAL AND ROOFING, INTERIOR AND EXTERIOR WINDOWS AND DOORS

1. Single-component Polyurethane Sealant: One-part, polyurethane-based elastomeric sealant, complying with FS-TT-S-0023OC, Class A, Type II recommended by manufacturer for application shown.
  - a. Provide Sonolastic NP-1 by Sonneborn

#### 3.8 NON-ELASTOMERIC SEALANTS AND CAULKING COMPOUNDS

##### A. INTERIOR APPLICATIONS EXCEPT WINDOWS AND DOORS

1. Single-component Acrylic Latex Sealant, Acrylic Latex Caulk, ASTM-C-834-76
  - a. Provide "Sonolac" by Sonneborn

##### B. EXTERIOR SHEET METAL AND ROOFING APPLICATIONS

1. Butyl Rubber Sealant: Provide polymerized butyl rubber and inert fillers (pigments), solvent-based with minimum 75% solids, non-sag consistency, tack-free time of 24 hours or less, paintable, non-staining: Complying with FS-TT-S-001657
  - a. Provide "Butakauk" by Sonneborn

**END OF SECTION 079200**

**SECTION 081213 – HOLLOW METAL FRAMES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes hollow metal frames for doors and windows. In both standard and thermally broken applications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 9 Section "Gypsum Board Assemblies" for anchors into light gauge framing construction.
  - 2. Division 8 Section "Door Hardware" for door hardware and weatherstripping.
  - 3. Division 9 Section "Painting" for field painting primed doors and frames.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
  - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

**1.4 QUALITY ASSURANCE**

- A. Provide doors and window frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver frames cardboard-wrapped or crated to provide protection during transit and job storage
- B. Inspect frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking..

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Steel Frames:
    - a. Amweld Building Products, Inc.
    - b. Benchmark Commercial Doors.
    - c. Ceco Door Products.
    - d. Copco Door Co.
    - e. Curries Co.
    - f. Deansteel Manufacturing Co.
    - g. Fenestra Corp.
    - h. Kewanee Corp.
    - i. Mesker Door, Inc.
    - j. Pioneer Industries.
    - k. Republic Builders Products.
    - l. Steelcraft.

### 2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 (ASTM A 526M), commercial quality, or ASTM A 642 (ASTM A 642M), drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G 60 (ASTM A 525M, with Z 180 or ZF 180) coating designation, mill phosphatized.

- D. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

## 2.3 FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 14 gage cold-rolled steel sheet.
  - 1. Fabricate frames with knock-down corners.
  - 2. Form exterior frames from 0.0785-inch- (2.0-mm-) thick galvanized steel sheet.
  - 3. Door or window frames one perimeter walls shall be thermally broken where indicated on floor plan and door schedule.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- C. Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- D. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

## 2.4 FABRICATION

- A. Fabricate steel frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
- B. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- D. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable



requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

- E. Reinforce frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- F. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

## 2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.
- C. Apply primers and organic finishes to doors and frames after fabrication.

## 2.6 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
  - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.
  - 1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

## 2.7 STEEL SHEET FINISHES

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.

- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. General: Install frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
- 1 Place frames before constructing enclosing walls and ceilings.
  - 2 In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In wood stud partitions, attach wall anchors to studs with screws.
  - 3 Install fire-rated frames according to NFPA 80.

#### **3.2 ADJUSTING AND CLEANING**

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 081113

**SECTION 081313 – HOLLOW METAL DOORS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes hollow metal doors.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 9 Section "Gypsum Board Assemblies" for anchors into light gauge framing construction.
  - 2. Division 8 Section "Door Hardware" for door hardware and weatherstripping.
  - 3. Division 8 Section "Glazing" for glazing types and thickness.
  - 4. Division 9 Section "Painting" for field painting primed doors and frames.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
  - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

**1.4 QUALITY ASSURANCE**

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.
- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking..

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Steel Doors and Frames:
    - a. Amweld Building Products, Inc.
    - b. Benchmark Commercial Doors.
    - c. Ceco Door Products.
    - d. Copco Door Co.
    - e. Curries Co.
    - f. Deansteel Manufacturing Co.
    - g. Fenestra Corp.
    - h. Kewanee Corp.
    - i. Mesker Door, Inc.
    - j. Pioneer Industries.
    - k. Republic Builders Products.
    - l. Steelcraft.

### 2.2 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569 (ASTM A 569M).
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366 (ASTM A 366M), commercial quality, or ASTM A 620 (ASTM A 620M), drawing quality, special killed.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526 (ASTM A 526M), commercial quality, or ASTM A 642 (ASTM A 642M), drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G 60 (ASTM A 525M, with Z 180 or ZF 180) coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

## 2.3 DOORS

- A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:
  - 1. Interior Doors: Grade II, heavy-duty, Model 1, full flush design. Provide doors manufactured by Steelcraft Manufacturing Company or equal and as follows:
    - a. Type: L-16, 1-3/4" thick, 16 gage steel
    - b. Core: Polyurethane core
    - c. Finish: Phosphatized and one coat primer

## 2.5 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.
- C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- E. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
- F. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- G. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

## 2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.
- C. Apply primers and organic finishes to doors and frames after fabrication.

## 2.7 GALVANIZED STEEL SHEET FINISHES

Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

## 2.8 STEEL SHEET FINISHES

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.
- C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.
  - 1 In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
  - 2 In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In wood stud partitions, attach wall anchors to studs with screws.

### 3.2 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

END OF SECTION 08110

**SECTION 081423****OUT-SWING ENTRY DOORS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Out-swing entry doors.

**1.2 RELATED SECTIONS**

- A. Section 07 27 00 – Air Barriers: Water-resistant barrier.
- B. Section 07 92 00 – Joint Sealants: Sealants and caulking.
- C. Section 08 71 00 – Door Hardware.

**1.3 REFERENCES**

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 502 – Voluntary Specification for Field Testing of Windows and Sliding Doors.
  - 2. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM B 368 – Copper-Accelerated Acetic Acid - Salt Spray (Fog) Testing (CASS Test).
  - 2. ASTM C 1036 – Flat Glass.
  - 3. ASTM C 1048 – Heat-Treated Flat Glass–Kind HS, Kind FT Coated and Uncoated Glass.
  - 4. ASTM D 1149 – Rubber Deterioration – Surface Ozone Cracking in a Chamber.
  - 5. ASTM D 2803 – Filiform Corrosion Resistance of Organic Coatings on Metal.
  - 6. ASTM D 4060 – Abrasion Resistance of Organic Coatings by the Taber Abraser.
  - 7. ASTM E 283 – Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
  - 8. ASTM E 330 – Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
  - 9. ASTM E 331 – Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 10. ASTM G 85 – Modified Salt Spray (Fog) Testing.
  - 11. ASTM E 1300 – Standard Practice for Determining Load Resistance of Glass in Buildings.
- C. Window and Door Manufacturers Association (WDMA):
  - 1. AAMA/WDMA/CSA 101/I.S.2/A440 – Windows, Doors and Unit Skylights.
  - 2. WDMA I.S.4 – Water Repellent Preservative Treatment for Millwork.
  - 3. CS2 Hallmark Program Procedural Guide for Side Hinged Exterior Door Systems



## 1.4 PERFORMANCE REQUIREMENTS

- A. Doors shall have a certified rating of DP [ \_\_\_\_ ] in accordance with WDMA CS2 Hallmark Program Guide for Side-hinged Exterior Door Systems.
- B. Door Unit Air Leakage, ASTM E 283, 1.57 psf (25 mph): 0.30 cfm per square foot of frame or less.
- C. Door Unit Water Penetration: No water penetration through door unit when tested in accordance with ASTM E 331 with water applied at rate of 5 gallons per hour per square foot. Doors with standard sill shall have water resistance performance level up to 7.5 psf and low profile sill (ADA) shall have water resistance performance level of 0 psf.

## 1.5 SUBMITTALS

- A. Comply with Division 1 requirements.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.
- D. Samples: Submit full-size or partial full-size sample of door illustrating glazing system, quality of construction, and color of finish.
- E. Warranty: Submit manufacturer's standard warranty.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
- B. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.
- C. Handling: Protect materials and finish during handling and installation to prevent damage.

# PART 2 PRODUCTS

## 2.1 MANUFACTURERS

- A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Phone (641) 621-1000. Website [www.pella.com](http://www.pella.com). (Basis of Design)
- B. Marvin, POB 100, Warroad, MN 56763. Phone (888) 537-7828. Website [www.marvin.com](http://www.marvin.com).
- C. Kolbe Windows & Doors, 1323 S 11<sup>th</sup> Ave., Wausau, WI 54401. Phone (715) 842-5666. Website [www.kolbewindows.com](http://www.kolbewindows.com).

## 2.2 OUT-SWING ENTRY DOORS

- A. Out-Swing Entry Doors: Factory-assembled doors with outward-swing door panels installed in frames.
  - a. Basis of Design: Out-swing Entry Door by Pella, Craftsman Light, prefinished 2-panel insulated steel door with aluminum clad wood frame.
- B. Frames:
  - 1. Soft wood, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the head and jambs.
  - 2. Interior Exposed Surfaces: Primed ready for site finishing with no visible fastener holes.
  - 3. Exterior Surfaces: Aluminum Clad Wood
  - 4. Sills: Extruded aluminum.
    - a. Aluminum Sills with the following finishes: Mill Finish
    - b. ADA Approved Low Profile Vent Sill.
  - 5. Frame Dimensions:
    - a. Overall Frame Depth: 5-15/16 inches (150 mm).
    - b. Nail-fin or Brickmould Frame Depth: 4-9/16 inches (116 mm).
    - c. Provide Jamb Extensions on 1/8" increments up to 9-3/16" inches (233 mm).
- C. Door Panels:
  - 1. Steel Door Panels:
    - a. 24-gauge galvanized steel skins on exterior and interior surfaces with CFC-free injected foam.
    - b. Rails and Stiles: Wood top rail and stiles and wood plastic composite bottom rails secured with structural adhesive between skins at perimeter.
    - c. Lock Block: 12-inches or greater, solid wood.
    - d. Panel Thickness: 1-11/16 inches (43 mm).
  - 2. Hardware Preparation
    - a. No bore
  - 3. Door Closer and Panic Hardware Reinforcement: Solid reinforcement positioned to support surface-mounted closer and panic hardware.
- D. Weather Strip:
  - 1. Head: Dual-seal weatherstrip shall contact interior face and side of door panel and extruded leaf rain screen shall cover the exterior face of door panel.
  - 2. Jambs: Dual-seal weatherstrip shall contact interior face and side of door panel.

3. Sill: Bristle rain screen at exterior face of door panel with bulb weatherstrip on threshold shall contact interior face of door panel.

## 2.3 GLAZING

- A. Glazing:
  1. Float Glass: ASTM C 1036, Quality 1.
    - a. Tempered Glass: ASTM C 1048.
    - b. ASTM E1300 compliant.
  2. Type:
    - a. Tempered Insulating Glass: Clear, multi-layer Low-E coated with argon, dual-seal insulating glass, installed into high-performance glazing frames.

## 2.4 GLAZING OPTIONS

- A. Simulated Divided Light (Craftsman Light)
  1. Profile: 7/8-inch (Pella Brand).
  2. Expanded PVC (Pella Brand) permanently bonded to interior and exterior of the glass.
  3. Pattern: (3) Lites wide x (2) Lites high Traditional.
  4. Finish: Factory-finished to match door panel.

## 2.5 HARDWARE

- A. Hinges: Three (3) per door panel on 7' 0" panel heights.
  1. Type:
    - a. 4-inch by 4-inch by 0.100-inch thick cold-rolled steel with Ball bearings and non-removal pin.
  2. Finish: [US32D, stainless steel]
- B. Frames are prepared for hardware to match door panel boring (no boring). Doors and frames shall be prepared for panic device and closer.

## 2.6 TOLERANCES

- A. Doors shall accommodate the following opening tolerances:
  1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
  2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
  3. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

## 2.7 FINISH

- A. Door Frame Exterior Finish System: Pella EnduraClad.
  1. Exterior aluminum door frame surfaces shall be finished with the following multi-stage system:

- a. Clean and etch aluminum surface of oxides.
  - b. Pre-treat with conversion coating.
  - c. Prime with baked-on modified polyester primer.
  - d. Top coat with baked-on polyester enamel.
2. Color: to be selected by Architect from full range of manufacturers standard colors..
3. Performance Requirements: Exterior aluminum finishes shall meet or exceed the following performance requirements of AAMA 2605:
  - a. Dry Film Hardness: Eagle Turquoise Pencil, F minimum.
  - b. Film Adhesion: 1/16-inch crosshatch, dry, wet, boiling water.
  - c. Impact Resistance: 1/10-inch distortion, no film removal.
  - d. Abrasion Resistance: Falling sand coefficient value of 20 minimum.
  - e. Chemical Resistance: 10 percent Muriatic acid, 15 minutes. Mortar pat test, 24 hours.
  - f. Detergent Resistance: 3 percent at 100 degrees F, 72 hours.
  - g. Corrosion Resistance: Humidity, 3,000 hours. Salt spray exceeds 3,000 hours.
- B. Exterior Finish System Performance Requirements:
  1. Exterior aluminum finishes shall meet or exceed the following performance requirements:
    - a. Copper-Accelerated Acetic Acid Salt Spray (Fog) Testing (CASS Test), ASTM B 368.
    - b. Ozone Deterioration, ASTM D 1149, Modified: 5 ppm ozone, 160 degrees F, 60 percent relative humidity, 100 hours exposure, little or no loss of cure.
    - c. Filiform Corrosion Resistance of Organic Coatings on Metal, ASTM D 2803: No corrosion.
    - d. Taber Abrasion Resistance, ASTM D 4060: 500 g weight, CS-10 wheel, 500 cycles, less than 25 g weight loss.
    - e. Cyclic Acidified Salt Fog Test, ASTM G 85, Appendix A-2.
- C. Door Panel Exterior Finish:
  1. Steel Door Panels: Factory pre-finished, satin polyurethane paint; color TBD by Architect.
- D. Door Frame Interior Finish: Factory pre-finished, paint; [White] [Bright white] [Linen] TBD by Architect.
- E. Door Panel Interior Finish:
  1. Steel Door Panels: Factory pre-finished paint; color TBD by Architect.

## 2.8 INSTALLATION ACCESSORIES

- A. Flashing/Sealant Tape: Pella SmartFlash.
  1. Aluminum-foil-backed butyl window and door flashing tape.
  2. Maximum Total Thickness: 0.013 inch.

3. UV resistant.
  4. Verify sealant compatibility with sealant manufacturer.
- B. Interior Insulating-Foam Sealant: Low-expansion, low-pressure polyurethane insulating window and door foam sealant.
- C. Exterior Perimeter Sealant: "Pella Window and Door Installation Sealant" or equivalent high quality, multi-purpose sealant as specified in the joints sealant section.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

### **3.2 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and approved shop drawings.
- B. Install doors to be weather-tight and freely operating.
- C. Maintain alignment with adjacent work.
- D. Secure assembly to framed openings, plumb and square, without distortion.
- E. Integrate door system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with door manufacturer's instructions.
- F. Place interior seal around door perimeter to maintain continuity of building thermal and air barrier using [backer rod and sealant] [insulating-foam sealant].
- G. Seal door to exterior wall cladding with sealant and related backing materials at perimeter of assembly.
- H. Leave doors closed.

### **3.3 CLEANING**

- A. Clean door frames and glass in accordance with Division 1 requirements.
- B. Do not use harsh cleaning materials or methods that would damage finish.
- C. Remove manufacturer's proprietary labels and visible markings.

### **3.4 PROTECTION**

- A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

**END OF SECTION**

**SECTION 083600 – SECTIONAL OVERHEAD DOOR****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Insulated Sectional Overhead Doors.
- B. Operating Hardware, tracks, and support.

**1.2 RELATED SECTIONS**

- A. Section 061000 – Rough Framing and supports.
- B. Section 079200 - Joint Sealers: Perimeter sealant and backup materials.

**1.3 REFERENCES**

- A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

**1.4 DESIGN / PERFORMANCE REQUIREMENTS**

- A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
  - 1. Design pressure of 20.9 lb/sq ft
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

**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: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Operation and Maintenance Data.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Protect materials from exposure to moisture until ready for installation.
- C. Store materials in a dry, ventilated weathertight location.

## 1.8 PROJECT CONDITIONS

- A. Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

## 1.9 WARRANTY

- A. Warranty: Manufacturer's limited door and operators System warranty for 10 year against delamination of polyurethane foam from steel face and all other components for 3 years or 20,000 cycles, whichever comes first.

# PART 2 PRODUCTS

## 2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide one of the following:
  - 1. Overhead Door Corp.



2. Clopay Building Products Co, Inc.
3. C.H.I. Overhead Doors, Inc.

- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

## 2.2 INSULATED SECTIONAL OVERHEAD DOORS

- A. Insulated Steel Sectional Overhead Doors: 599 Series Thermacore Insulated Steel Doors by Overhead Door Corporation. Units shall have the following characteristics:
1. Door Assembly: Metal/foam/metal sandwich panel construction, with PVC thermal break and weather-tight ship-lap design meeting joints.
    - a. Panel Thickness: 2 inches (51 mm).
    - b. Exterior Surface: Flush, textured.
    - c. Exterior Steel: .015 inch (.38 mm), hot-dipped galvanized.
    - d. End Stiles: 16 gauge with thermal break.
    - e. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of diecast aluminum with high strength galvanized aircraft cable. Sized with a minimum 7 to 1 safety factor.
      - 1) Standard cycle spring: 10,000 cycles.
      - 2) High cycle spring: 25,000 cycles.
      - 3) High cycle spring: 50,000 cycles.
      - 4) High cycle spring: 75,000 cycles.
      - 5) High cycle spring: 100,000 cycles.
    - f. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
    - g. Thermal Values: R-value of 17.50; U-value of 0.057.
    - h. Air Infiltration: 0.08 cfm at 15 mph; 0.08 cfm at 25 mph.
  2. Finish and Color: Two coat baked-on polyester.
    - a. Interior color, white.
    - b. Exterior color, white.
  3. Windload Design: Provide to meet the Design/Performance requirements specified.
  4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
  5. Lock:
    - a. Interior mounted slide lock.
    - b. Interior mounted slide lock with interlock switch for automatic operator.
    - c. Keyed lock.
    - d. Keyed lock with interlock switch for automatic operator.
    - e. Locking mechanism designed to maintain security for exterior while permitting break out when impacted from the inside.
  6. Weatherstripping:

- a. EPDM bulb-type strip at bottom section.
  - b. Flexible Jamb seals.
  - c. Flexible Header seal.
- 7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
  - a. Size:
    - 1) 3 inch (76 mm).
  - b. Type:
    - 1) Match existing.
- 8. Manual Operation: Chain hoist.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until openings have been properly prepared.
- B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- C. Verify electric power is available and of correct characteristics.
- D. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.3 INSTALLATION

- A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.
- B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- C. Anchor assembly to wall construction and building framing without distortion or stress.
- D. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

- E. Fit and align door assembly including hardware.
- F. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

### 3.4 CLEANING AND ADJUSTING

- A. Adjust door assembly to smooth operation and in full contact with weatherstripping.
- B. Clean doors, frames and glass.
- C. Remove temporary labels and visible markings.

### 3.5 PROTECTION

- A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.
- B. Protect installed products until completion of project.
- C. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

### END OF SECTION

**SECTION 085313 - FIBERGLASS WINDOWS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes operable fiberglass-framed windows.

**1.3 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of fiberglass window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances, installation details, and the following:
  - 1. Main Framing Member: **12-inch-** long, full-size sections of window frame with factory-applied color finish.
- C. Samples for Verification: For vinyl windows and components required, prepared on Samples of size indicated below.
- D. Maintenance Data: For operable window sash finishes to include in maintenance manuals.
- E. Warranty: Special warranty specified in this Section.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: An installer acceptable to fiberglass window manufacturer for installation of units required for this Project.
- B. Source Limitations: Obtain vinyl windows through one source from a single manufacturer.

## 1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify fiberglass window openings by field measurements before fabrication and indicate measurements on Shop Drawings.
  - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating fiberglass windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

## 1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, air infiltration, or condensation.
    - c. Faulty operation of movable sash and hardware.
    - d. Deterioration of vinyl, other materials, and finishes beyond normal weathering.
    - e. Failure of insulating glass.
  - 2. Warranty Period:
    - a. Window: 10 years from date of Substantial Completion.
    - b. Glazing: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Pella Corporation, 102 Main Street, Pella, Iowa 50219. Phone (641) 621-1000. Website [www.pella.com](http://www.pella.com). (Basis of Design)
- B. Marvin, POB 100, Warroad, MN 56763. Phone (888) 537-7828. Website [www.marvin.com](http://www.marvin.com).
- C. Kolbe Windows & Doors, 1323 S 11th Ave., Wausau, WI 54401. Phone (715) 842-5666. Website [www.kolbewindows.com](http://www.kolbewindows.com).

- D. Manufacturers: Subject to compliance with requirements, provide Pella, Impervia fiberglass Casement windows with integral color interior and exterior TBD by Architect.

## 2.2 FIBERGLASS CASEMENT WINDOWS

- A. Window Type: Subject to compliance with requirements, provide Pella, Integrity fiberglass awning windows as indicated (size) on Drawings and Schedules. Integral color interior and exterior shall be determined by Architect.
- B. At Shop Building: Provide 3-o/4-o, no grills.
- C. At Cabins: Provide 3-o/4-o, with color matched grills between the glass. Window shall meet the minimum clear opening of 24"h x 20"w and 5.7 sf min.

## 2.3 GLAZING

- A. Glass and Glazing Materials: Provide manufacturer's standard insulating glass units, Low-E II with Argon glazing factory-installed in Integrity window units by Pella Windows and Doors.

## 2.4 HARDWARE AND ACCESSORIES

- A. General: Provide manufacturer's standard hardware, including the following:
  - 1. Hardware color: TBD by Architect
  - 2. Interior Screen: Provide color matched screen frames and standard screens at Shop Building windows. No screen at Cabins windows (typ).
  - 3. Jambs: Provide jamb extensions to match wall thickness.
  - 4. Standard integral nailing fin

## 2.5 FABRICATION

- A. Fabricate fiberglass windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

## 2.6 FIBERGLASS FINISHES

- A. Integral Finish and Color: Manufacturer's standard uniform, solid, homogeneous interior and exterior to be selected by Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate, and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weathertight window installation.
  - 1. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches of opening.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

### 3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- E. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 085313



**SECTION 087100 - DOOR HARDWARE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
  - 2. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.
- C. Products furnished but not installed under this Section include:
  - 1. Cylinders for locks on entrance doors.
  - 2. Exit devices
  - 3. Removable mullions
  - 4. Door closers

**1.3 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.
- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    - a. Type, style, function, size, and finish of each hardware item.
    - b. Name and manufacturer of each item.

- c. Fastenings and other pertinent information.
  - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
  - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
  - f. Mounting locations for hardware.
  - g. Door and frame sizes and materials.
  - h. Keying information.
2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
- D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

## 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
- C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

## 1.6 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- B. Manufacturers: For design purposes only, each hardware item has been listed using the designation of a particular manufacturer. Subject to compliance with requirements, provide products by one of the Hardware manufacturers listed in the Hardware Schedule or by one of the manufacturers listed in the schedule as an acceptable substitute.

### 2.2 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products are identified by using hardware designation numbers of the following:
1. Manufacturer's Product Designations: The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated or, where more than one manufacturer is specified under the Article "Manufacturers" in Part 2 for each hardware type, the comparable product of one of the other manufacturers that complies with requirements.
  2. ANSI/BHMA designations used elsewhere in this Section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this Section.
    - a. Butts and Hinges: ANSI/BHMA A156.1.
    - b. Bored and Preassembled Locks and Latches: ANSI/BHMA A156.2.
    - c. Exit Devices: ANSI/BHMA A156.3.
    - d. Door Controls - Closers: ANSI/BHMA A156.4.
    - e. Auxiliary Locks and Associated Products: ANSI/BHMA A156.5.
    - f. Architectural Door Trim: ANSI/BHMA A156.6.
    - g. Template Hinge Dimensions: ANSI/BHMA A156.7.
    - h. Door Controls - Overhead Holders: ANSI/BHMA A156.8.
    - i. Interconnected Locks and Latches: ANSI/BHMA A156.12.
    - j. Mortise Locks and Latches: ANSI/BHMA A156.13.
    - k. Sliding and Folding Door Hardware: ANSI/BHMA A156.14.
    - l. Closer Holder Release Devices: ANSI/BHMA A156.15.
    - m. Auxiliary Hardware: ANSI/BHMA A156.16.
    - n. Self-Closing Hinges and Pivots: ANSI/BHMA A156.17.
    - o. Materials and Finishes: ANSI/BHMA A156.18.

### 2.3 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable

nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.

1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.
  - C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
  - D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
  - E. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

## 2.4 LOCK CYLINDERS AND KEYING

- A. Equip locks with cylinders for interchangeable-core pin tumbler inserts. All hardware listed is to be provided as part of the contract.
- B. Equip locks with high-security cylinders that comply with performance requirements for Grade 1 cylinders as listed in ANSI/BHMA A156.5 and that have been tested for pick and drill resistance requirements of UL 437 and are UL listed.
- G. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.

## 2.5 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets
- B. Provide finishes that match those established by BHMA or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer."
- E. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes," including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
  - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."

- F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

### 3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.
- D. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the Installer, accompanied by representatives of the manufacturers of latchsets and locksets and of door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:
1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
  2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
  3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.

**HARDWARE SCHEDULE****CONVENTIONAL DOOR HARDWARE**

<b><u>ITEM</u></b>	<b><u>MANUFACTURER SPECIFIED</u></b>	<b><u>ACCEPTABLE SUBSTITUTIONS</u></b>
HINGES:	HAGER	STANLEY, BOMMER
CYLINDER:	BEST	
CLOSERS:	LCN	NORTON, SARGENT, STANLEY
EXIT DEVICE:	DOR-O-MATIC/FALCON	VON DUPRIN, PRECISION
KICK PLATES:	ROCKWOOD	TRIMCO, HAGER, IVES
OVHD STOPS:	GLYNN-JOHNSON	RIXSON, ABH
THRESHOLDS	PEMKO	NGP, REESE
SEAL/DOOR BOTTOMS:	PEMKO	REESE, NATIONAL GUARD

**DOOR NO.**      **HARDWARE SET****SHOP BUILDING**

101	1
101B	2
102	N/A
103	N/A
104	3
105	1
106	1

**CABINS (2)**

201A	4
201B	4
202A	5
202B	5

**HARDWARE SET****SET 1**

<b><u>QUANTITY</u></b>	<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>
3 EACH	HINGES	BB1279 4.5" X 4.5" X 626
1 EACH	EXIT DEVICE	179L-NL X 36" X US32D X DANE X CYLINDER
1 EACH	SECURITY BAR	MCK3572SP X 84"
1 EACH	CLOSER	4041-HCUSH X TBSRT X 689
1 EACH	KICKPLATE	12" X 2" LTDW X 630 interior side
1 EACH	THRESHOLD	200AT X LAR X SS/MS 7 ES25
1 EACH	WEATHER STRIP	S88D X LAR
1 EACH	DRIP CAP	ALUM X 2" wider than door ea.side
1 EACH	DOOR SWEEP	ALUM X DOOR WIDTH

**SET 2**

<b><u>QUANTITY</u></b>	<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>
3 EACH	HINGES	BB1279 4.5" X 4.5" X 626
1 EACH	PRIVACY LOCK	L9496 X 626
2 EACH	KICKPLATE	12" X 2" LTDW X 630
1 EACH	WALL STOP	WS407-CCV X 626
3 EACH	SILENCERS	SR64

**SET 3**

<b><u>QUANTITY</u></b>	<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>
3 EACH	HINGES	BB1279 4.5" X 4.5" X 626
1 EACH	EXIT DEVICE	179L-NL X 36" X US32D X DANE X CYLINDER
1 EACH	CLOSER	4041-HCUSH X TBSRT X 689
2 EACH	KICKPLATE	12" X 2" LTDW X 630 X ea side
1 EACH	THRESHOLD	200AT X LAR X SS/MS 7 ES25
1 EACH	WEATHER STRIP	S88D X LAR
3 EACH	SILENCERS	SR64

**SET 4**

<b><u>QUANTITY</u></b>	<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>
3 EACH	HINGES	BY DOOR MANUF
1 EACH	EXIT DEVICE	179L-NL X 36" X US32D X DANE X CYLINDER
1 EACH	CLOSER	4041-HCUSH X TBSRT X 689
1 EACH	THRESHOLD	BY DOOR MANUF
1 EACH	WEATHER STRIP	BY DOOR MANUF

**SET 5**

<b><u>QUANTITY</u></b>	<b><u>ITEM</u></b>	<b><u>DESCRIPTION</u></b>
3 EACH	HINGES	BB1279 4.5" X 4.5" X 626
1 EACH	EXIT DEVICE	2670 X 36" X US28 X CYLINDER
1 EACH	DUMMY TRIM	230DT X 050140
1 EACH	SECURITY BAR	MCK3572SP X 84"
1 EACH	CLOSER	4041-HCUSH X TBSRT X 689
1 EACH	KICKPLATE	12" X 2" LTDW X 630 interior side
1 EACH	THRESHOLD	200AT X LAR X SS/MS 7 ES25
1 EACH	WEATHER STRIP	S88D X LAR
1 EACH	DRIP CAP	ALUM X 2" wider than door ea.side
1 EACH	DOOR SWEEP	ALUM X DOOR WIDTH

END OF SECTION 087100



**SECTION 088000 - GLAZING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:

- 1. Hollow Metal Doors.

**1.3 DEFINITIONS**

- A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.
- B. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's directions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- C. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.
- D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

**1.4 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading

(where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

## 1.5 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each glass product and glazing material indicated.
- C. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

## 1.6 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. FGMA Publications: "FGMA Glazing Manual."
  - 2. AAMA Publications: AAMA TIR-A7 "Sloped Glazing Guidelines" and "Glass Design for Sloped Glazing."
  - 3. LSGA Publications: "LSGA Design Guide."
  - 4. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines" and TB-3001 "Sloped Glazing Guidelines."
- B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
  - 1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
  - 2. It is glass supplier's responsibility to install safety glass of the same general characteristics as non-safety glass specified when codes require. Supplier to use only laminated glass where safety glass is required.
- C. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

- D. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:
1. Insulating Glass Certification Council (IGCC).
  2. Associated Laboratories, Inc. (ALI).
  3. National Certified Testing Laboratories (NCTL).
- E. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
- F. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
1. Primary glass of each (ASTM C 1036) type and class indicated.
  2. Heat-treated glass of each (ASTM C 1048) condition indicated.
  3. Laminated glass of each (ASTM C 1172) kind indicated.
  4. Insulating glass of each construction indicated.
- G. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

## 1.7 WARRANTY

- A. General: Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. Manufacturer's Warranty on Coated Glass Products: Submit written warranty signed by coated glass manufacturer agreeing to furnish replacements for those coated glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.
1. Warranty Period: Manufacturer's standard but not less than 5 years after date of Substantial Completion.
- C. Manufacturer's Warranty on Laminated Glass: Submit written warranty signed by insulating glass manufacturer agreeing to furnish replacements for those laminated glass units that deteriorate as defined in the "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal

conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.

1. Warranty Period: Manufacturer's standard but not less than 5 years after date of Substantial Completion.

- D. Manufacturer's Warranty on Insulating Glass: Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, protecting, and maintaining practices contrary to glass manufacturer's published instructions.

1. Warranty Period: Manufacturer's standard but not less than 10 years after date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the products specified in Product Data Sheets at end of this Section.

### **2.2 PRIMARY FLOAT GLASS PRODUCTS**

- A. Float Glass – Exterior doors: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select).

### **2.3 INSULATING GLASS PRODUCTS**

- A. Sealed Insulating Glass Units: Preassembled units consisting of organically sealed lites of glass separated by dehydrated air spaces complying with ASTM E 774 and with other requirements indicated, including those in Insulating Glass Product Data Sheet at the end of this Section.

1. Provide 3/4" insulating glass units consisting of 1/4" glass and 1/2" airspace in all doors and window glazing (insulated for sound).

### **2.4 SAFETY GLASS PRODUCTS**

- A. Safety Glass Products: Provide laminated glass only in all areas where safety glass is required. Provided coated safety glass in locations where required to match adjacent glass systems.

### **2.5 ELASTOMERIC GLAZING SEALANTS**

- A. General: Provide products of type indicated, complying with the following requirements:
  - 1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
  - 3. Colors: Provide color of exposed joint sealants to comply with the following:
    - b. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.
- B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.

## 2.6 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

### 3.3 GLAZING, GENERAL

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass from edge damage during handling and installation as follows:
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
  - 1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except

where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.

2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.4 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.
- E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

## GLAZING SCHEDULE

**NOTE:** It is glass supplier's responsibility to install safety glass of the same general characteristics as non-safety glass specified when codes require.

1. Hollow Metal Framed Interior Doors:

- a. Provide 1/4" safety glass, clear, uncoated.

2. Hollow Metal Framed Interior Windows:

- a. Provide 1/4" primary float glass, clear, uncoated.

END OF SECTION 088000



**SECTION 092900 - GYPSUM BOARD ASSEMBLIES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Gypsum board assemblies attached to steel framing.
  - 2. Paperless gypsum units installed with gypsum board assemblies.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.

**1.4 QUALITY ASSURANCE**

- A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.
- B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

**1.5 PROJECT CONDITIONS**

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before

application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.

- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Gypsum Board and Related Products:
    - a. Domtar Gypsum.
    - b. Georgia-Pacific Corp.
    - c. National Gypsum Co.; Gold Bond Building Products Division.
    - d. United States Gypsum Co.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work where proprietary gypsum wallboard is indicated include, but are not limited to, the following:
  - 1. Gyprock Fireguard C Gypsum Board; Domtar Gypsum.
  - 2. Firestop Type C; Georgia-Pacific Corp.
  - 3. Fire-Shield G; National Gypsum Co.; Gold Bond Building Products Division.
  - 4. SHEETROCK Brand Gypsum Panels, FIRECODE C Core; United States Gypsum Co.
  - 5. SHEETROCK Brand Gypsum Panels, ULTRACODE Core; United States Gypsum Co.

### 2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

### 2.3 INTERIOR GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
  - 1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).
- B. Gypsum Wallboard (GB): ASTM C 36 and as follows:
  - 1. Type: Regular for vertical surfaces, unless otherwise indicated.

2. Edges: Tapered.
3. Thickness: 5/8 inch.

#### C. EXTERIOR GYPSUM BOARD PRODUCTS

1. Exterior Gypsum Board: ASTM C 931/C 931M or ASTM C 1396/C 1396M, with manufacturer's standard edges.
  - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but **are not limited to**, the following:
    - 1) American Gypsum Co.
    - 2) BPB America Inc.
    - 3) G-P Gypsum.
    - 4) Lafarge North America Inc.
    - 5) National Gypsum Company.
    - 6) PABCO Gypsum.
    - 7) Temple.
    - 8) USG Corporation.
2. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.
  - a. Product: Subject to compliance with requirements, provide "Dens-Glass Gold" by G-P Gypsum.
  - b. Core: regular type 5/8 inch (15.9 mm), Type X.
  - c. Edges: Tapered
  - d. Thickness: 5/8 inch.
  - e. Finish: Joints finished and painted.

#### 2.4 TRIM ACCESSORIES

- A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
  1. Material: Formed metal or plastic, with metal complying with the following requirement:
    - a. Steel sheet zinc coated by hot-dip or electrolytic process, or steel sheet coated with aluminum or rolled zinc.
  2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
    - a. Cornerbead on outside corners, unless otherwise indicated.
    - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
    - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

- d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
- e. One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

## 2.5 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.
  - 1. Use pressure-sensitive or staple-attached, open-weave, glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Joint Tape for Paperless gypsum Units: As recommended by unit manufacturer.
- D. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
- E. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
  - 1. Ready-Mixed Formulation: Factory-mixed product.
    - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
    - b. Topping compound formulated for fill (second) and finish (third) coats.
    - c. All-purpose compound formulated for both taping and topping compounds.
  - 2. Job-Mixed Formulation: Powder product for mixing with water at Project site.
    - a. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
    - b. Topping compound formulated for fill (second) and finish (third) coats.
    - c. All-purpose compound formulated for both taping and topping compounds.
- F. Joint Compound for Cementitious Backer Units: Material recommended by cementitious backer unit manufacturer.

## 2.6 ACOUSTICAL SEALANT

- A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:
  - 1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

## 2.7 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.
- C. Steel drill screws complying with ASTM C 1002 for the following applications:
  - 1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.
  - 2. Fastening gypsum board to wood members.
  - 3. Fastening gypsum board to gypsum board.
- D. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
- E. Steel drill screws of size and type recommended by unit manufacturer for fastening cementitious backer units.
- F. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- G. Foam Gaskets: Closed-cell vinyl foam adhesive-backed strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit metal stud size indicated.
- H. Sound-Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing).
  - 1. Mineral-Fiber Type: Fibers manufactured from glass.
- I. Polyethylene Vapor Retarder: ASTM D 4397, thickness and maximum permeance rating as follows:
  - 1. 6 mils (0.15 mm), 0.13 perms (7.5 ng/Pa x s x sq. m).
- J. Vapor Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.
  - 1. Furnish concrete inserts and other devices indicated to other trades for installation well in advance of time needed for coordination with other construction.

**3.3 INSTALLING STEEL FRAMING, GENERAL****3.4 APPLYING AND FINISHING GYPSUM BOARD, GENERAL**

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

- F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.
- I. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches (813 mm) wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
- J. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.
- K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.
  - 1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- L. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- M. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.
  - 1. Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.
- N. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

### 3.5 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    - b. At stairwells and other high walls, install panels horizontally.
- B. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:
1. Install paperless gypsum units to comply with ANSI A108.11 at locations indicated to receive wall tile.
  2. Install paperless gypsum backing board where indicated. Install according to manufacturer's recommendations.
- C. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers prior to applying base layers on walls/partitions; apply gypsum wallboard face layers in same sequence. Offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints. Apply base layers at right angles to framing members, unless otherwise indicated.
- D. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and gypsum wallboard face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints. Stagger joints on opposite sides of partitions.
- E. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
1. Fasten with screws.

### 3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install cornerbead at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.



2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
  3. Install U-bead where indicated.
  4. Install aluminum trim and other accessories where indicated.
- D. Install control joints at locations indicated.
- E. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

### 3.7 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.
- D. Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.
- E. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
  2. Level 2 where panels form substrates for tile and where indicated.
  3. Level 3 for gypsum board where indicated.
- F. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint compound.
- G. Where Level 2 gypsum board finish is indicated, embed tape in joint compound and apply first coat of joint compound.
- H. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.
- I. Base for Acoustical Tile: Where gypsum board is indicated as a base for adhesively applied acoustical tile, install joint tape and a 2-coat compound treatment, without sanding.
- J. Finish water-resistant gypsum backing board forming base for ceramic tile to comply with ASTM C 840 and gypsum board manufacturer's directions for treatment of joints behind tile.

- K. Finish cementitious backer units to comply with unit manufacturer's directions.

END OF SECTION 092900

**SECTION 096513 - RESILIENT COVE BASE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:

- 1. Resilient Cove Base (Rubber wall base).

**1.3 SUBMITTALS**

- A. Product Data: For each type of product specified.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors and patterns available for each type of product indicated.
- C. Product Certificates: Signed by manufacturers of resilient products certifying that each product furnished complies with requirements.
- D. Maintenance Data: For resilient floor tile to include in the maintenance manuals specified in Division 1.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing resilient products similar to those required for this Project and with a record of successful in-service performance.
- B. Source Limitations: Obtain each type, color, and pattern of product specified from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- C. Fire-Test-Response Characteristics: Provide products with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 W/sq. cm or greater when tested per ASTM E 648.
2. Smoke Density: Maximum specific optical density of 450 or less when tested per ASTM E 662.

#### 1.5 PROJECT CONDITIONS

- A. Maintain a temperature of not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive products for at least 48 hours before installation, during installation, and for at least 48 hours after installation, unless manufacturer's written recommendations specify longer time periods. After post-installation period, maintain a temperature of not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- B. Do not install products until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.
- D. Install tiles and accessories after other finishing operations, including painting, have been completed.
- E. Do not install flooring over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive, as determined by flooring manufacturer's recommended bond and moisture test.

#### 1.6 EXTRA MATERIALS

- F. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to quantities listed below, for each type, composition, color, pattern, and size indicated. Tile and trim units shall be in unopened boxes, undamaged.

Base – 48 lineal ft.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Flooring Schedule at the end of Part 3.

## 2.2 INSTALLATION ACCESSORIES

- A. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of linoleum and rubber products will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for product installation and comply with requirements specified.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with product manufacturer's written installation instructions for preparing substrates indicated to receive linoleum and rubber products.

### 3.3 RUBBER WALL BASE INSTALLATION

- A. General: Install rubber wall base according to manufacturer's written installation instructions.
- B. Apply rubber wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
  - 1. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
  - 2. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
  - 3. Do not stretch base during installation.
  - 4. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
  - 5. Form outside corners on job from straight pieces of maximum lengths possible, without whitening at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
  - 6. Form inside corners on job, from straight pieces of maximum lengths possible, by cutting an inverted V-shaped notch in toe of wall base at the point where

corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

### 3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing products:
1. Remove adhesive and other surface blemishes using cleaner recommended by resilient product manufacturers.
  2. Sweep or vacuum floor thoroughly.

### 3.5 RESILIENT BASE SCHEDULE

A. Rubber Cove Base:

1. Provide Armstrong, 4" height, Cove shape, 1/8" (color to be selected by Architect from manufacturer's full range), coil stock, with pre-formed outside corners, or equal.

Note: If any selection has been discontinued by Manufacturer, supplier will offer alternate selections from complete range of colors in this tile at no additional cost.

**END OF SECTION 096513**

**SECTION 099000- PAINTING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes surface preparation, painting, and finishing of the following exposed interior and exterior items and surfaces. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
  - 1. Exposed gypboard walls and ceilings.
  - 2. Galvanized hollow metal doors and frames, all locations
  - 3. Galvanized steel bollards, interior and exterior
  - 4. All other areas shown to receive paint
- B. Painting is not required on all other exposed items, including piping and conduit, electrical boxes, building structure (primed finish from manufacturer) miscellaneous structural elements, mechanical ductwork, prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

**1.3 SUBMITTALS**

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each paint system specified.
  - 1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
- C. Samples for initial color selection in the form of manufacturer's color charts.

**1.4 QUALITY ASSURANCE**

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.

- 1. Final acceptance of colors will be from job-applied samples.

## 1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are **not limited to**, the following:
  - 1. Devoe and Raynolds Co. (Devoe).
  - 2. Fuller O'Brien (Fuller).
  - 3. The Glidden Company (Glidden).
  - 4. Benjamin Moore and Co. (Moore).
  - 5. PPG Industries, Pittsburgh Paints (PPG).
  - 6. Pratt and Lambert (P & L).
  - 7. The Sherwin-Williams Company (S-W).
  - 8. Porter Paints (Porter)
  - 9. Sonneborn (floor finish)
  - 10. Contego (intumescent primer [www.contegointernational.com](http://www.contegointernational.com))

### 2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.



- B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
  - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

## 2.3 PRIMERS

- A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.
- B. Intumescent Primer: Provide fire-retardant primer for undercoating of exposed plywood building liner surfaces. Coordinate primer and finish coat to ensure durability and adhesiveness of final coat.

## 2.4 UNDERCOAT MATERIALS

- A. Undercoat Materials: Provide the manufacturer's recommended factory-formulated undercoat materials that are compatible with the substrate and finish coats indicated.

## 2.5 EXTERIOR FINISH PAINT MATERIAL (Shell walls,at non-conditioned face)

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.

## 2.6 INTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
  2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

### 3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
  2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen, as required, to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
  3. Plywood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off. Back and edge prime all plywood panels.

4. Ferrous Metals: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).
  5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.3 APPLICATION

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Complete Coverage: Regardless of number of coats specified, Painting Contractor shall provide complete coverage of items specified to receive paint. If specified number of coats is insufficient to cover completely, at Architect's discretion, Painting Contractor shall apply necessary additional paint coats required to cover surface. Architect shall be final judge as to sufficiency of coverage.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
1. Paint colors, surface treatments, and finishes are indicated in the schedules.
  2. Provide finish coats that are compatible with primers used.
  3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
  4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convactor covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
  6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
  8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
  10. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
  11. Sand lightly between each succeeding enamel or varnish coat.
  12. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- D. Application Procedures: Apply paints and coatings by brush or roller. Spray applications are not permitted.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- G. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

### 3.4 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
  - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

### 3.5 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
  - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.6 PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
- B. Ferrous Metal: Primer is not required on shop-primed items.
  - 1. Low-Luster Acrylic Finish: 2 finish coats over a rust-inhibitive primer.
    - a. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils (0.033 mm).
    - b. First and Second Coat: Low-sheen (eggshell or satin), exterior, acrylic-latex paint applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).
- C. Zinc-coated (galvanized) metal (where paint is Indicated on drawings or schedules):

1. Semigloss, Acrylic-Enamel Finish: 2 finish coats over a galvanized metal primer.
  - a. Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
  - b. First and Second Coats: Semigloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.6 mils (0.066 mm).
- D. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
  1. Low-Luster, Acrylic-Enamel Finish: 2 finish coats over a primer.
    - a. Primer: Latex-based, exterior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils (0.031 mm).
    - b. First and Second Coats: Low-luster (eggshell or satin), acrylic-latex, exterior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils (0.071 mm).

**END OF SECTION 099000**

**SECTION 131250- POLE-FRAMED BUILDING SYSTEMS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Structural framing. Shop Building only.
  - 2. Roof panels. Shop Building only.
  - 3. Wall panels. For use with Shop Building and Cabins.
  - 4. Insulation. Shop Building exterior walls only.
  - 5. Accessories and trim. For use with Shop Building and Cabins.
- B. Related Sections include the following:
  - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations and interior building slabs.
  - 2. Division 6 Section "Metal Plate Connected Wood Trusses" for trusses to be used for both the Shop Building and the two Cabins.
  - 3. Division 7 Section "Thermal Insulation" for use with interior and exterior walls & ceilings of Office & Toilet.
  - 4. Division 7 Section "Sheet Metal Flashings and Trim"
  - 5. Division 8 Section "Overhead Sectional Doors."
  - 6. Division 8 Section "Steel Doors and Frames"
  - 7. Division 8 Section "Door Hardware" for finish door hardware and keying not standard with metal building system manufacturer.
  - 8. Division 8 Section "Door Hardware" for finish door hardware and keying not standard with metal building system manufacturer.

**1.3 DEFINITIONS**

- A. Building Length: Refer to drawings - Dimensions given are minimums required. Building manufacturer to supply components which meet or exceed these dimensions. Any manufacturer's standard system which meets or exceeds these dimensions will be acceptable.
- B. Building Width: Refer to drawings - Dimensions given are minimums required. Building manufacturer to supply components which meet or exceed these

dimensions. Any manufacturer's standard system which meets or exceeds these dimensions will be acceptable.

- C. Clear Span: Distance between supports of beams, girders, or trusses (measured from lowest level of connecting area of a column and a rafter frame, or knee). Refer to drawings
- D. Eave Height: Vertical dimension from finished floor to eave (the line along the sidewall formed by intersection of the planes of the roof and wall). Refer to drawings - Dimensions given are minimums required. Building manufacturer to supply components which meet or exceed these dimensions. Any manufacturer's standard system which meets or exceeds these dimensions will be acceptable.
- E. Clear Height under Structure: Vertical dimension from finished floor to lowest point of any part of primary or secondary structure located within clear span. Refer to drawings - Dimensions given are minimums required. Building manufacturer to supply components which meet or exceed these dimensions. Any manufacturer's standard system which meets or exceeds these dimensions will be acceptable.

#### 1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide a complete, integrated set of pole-framed building system manufacturer's standard mutually dependent components and assemblies that form a pole-framed building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include primary and secondary framing, roof and wall panels, and accessories complying with requirements indicated, including those in this Article.
- B. Pole-framed Building System Design: Of size, and spans indicated, and as follows:
  - 1. Primary Frame Type: Provide the following:
    - a. Wood-framed Clear Span with exterior girts: Solid-member structural-framing system without interior columns. Horizontal girts continuous outside the structure.
  - 2. Secondary Frame Type: Manufacturer's standard truss system and the following girts:
    - a. Exterior-framed wood (bypass) girts.
  - 3. Eave Height: - Refer to drawings - Building manufacturer to supply components which meet or exceed these minimum dimensions. Any manufacturer's standard system which meets or exceeds these dimensions will be acceptable.



4. Bay Spacing: Manufacturer's standard to achieve overall minimum length and width dimensions indicated on drawings.
5. Roof Slope: Manufacturer's standard system.
6. Roof System: Manufacturer's standard lap-seam roof panels with field-installed insulation.
7. Exterior Wall System: Manufacturer's standard field-assembled insulation and wall panels.

C. Design Requirements:

1. Design structural systems according to professionally recognized methods and standards and legally adopted building codes.
2. Design under supervision of professional engineer licensed in Kentucky.
3. Building to be designed as "fully-enclosed" in accordance with ASCE 7-02 Section 6.2.
6. Design Loads:
  - a. Applicable Building Code: 2018 Kentucky Building Code, Rev 2 (IBC 2015)
  - b. Roof Live Load: 20 psf non-reducible
  - c. Roof Snow Load: 15 psf
  - d. Roof Wind Load: Calculate in accordance with applicable code, using 105 mph Basic Wind Speed, Exposure Category C and Importance Factor of 1.
  - e. Collateral Loads: 10 psf
  - f. Seismic Loads: Calculate and apply seismic loads in accordance with the requirements of applicable building code base on the following project specific values as applicable:
    1. Seismic Design Category: B
    2. Seismic Use Group: I
    3. SDS: .208
    4. SD1: .125
    5. Site Class: C

D. Wind-Uplift Resistance: Provide roof panel assemblies that meet requirements of UL 580 for the following wind-uplift resistance:

1. Class 90.

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of the following metal building system components:
1. Structural-framing system.

2. Roof panels.
  3. Wall panels.
  4. Insulation.
  5. Trim and closures.
  6. Accessories.
- B. Shop Drawings: For the following building system components. Include plans, elevations, sections, details, and attachments to other Work.
1. For installed components indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing. Indicate connections, distinguishing between shop and field applications. Include transverse cross-sections.
  3. Roof and Wall Panel Layout Drawings: Show layouts of panels on support framing, details of edge conditions, joints, panel profiles, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work.
  4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
    - a. Gutters.
    - b. Downspouts.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of the following products with factory-applied color finishes:
1. Roof panels.
  2. Wall panels.
  3. Trim and closures.
  4. Accessories.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected, in the profile and style indicated. Prepare Samples from the same material to be used for the Work.
1. Roof Panels: 12 inches (300 mm) long by actual panel width. Include clips, caps, battens, fasteners, closures, and other exposed panel accessories.
  2. Wall Panels: 12 inches (300 mm) long by actual panel width. Include clips, caps, battens, fasteners, closures, and other exposed panel accessories.
  3. Trim and Closures: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
  4. Accessories: 12-inch- (300-mm-) long samples for each type of accessory.
- E. Warranties: Special warranties specified in this Section.

## 1.6 QUALITY ASSURANCE

- A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- B. Source Limitations: Obtain each type of metal building system component through one source from a single manufacturer.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, or in-service performance.
- D. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to building systems including, but not limited to, the following:
  - 1. Inspect and discuss condition of foundations and other preparatory work performed by other trades.
  - 2. Review structural load limitations.
  - 3. Review and finalize construction schedule and verify availability of materials, Erector's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review required testing, inspecting, and certifying procedures.
  - 5. Review weather and forecasted weather conditions and procedures for unfavorable conditions.

## 1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when weather conditions permit roof and wall panel installation to be performed according to manufacturer's written instructions and warranty requirements.

## 1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty on Panel Finishes: Written warranty, signed by manufacturer agreeing to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

1. Warranty Period for Roof Panels: 20 years from date of Substantial Completion.
2. Warranty Period for Wall Panels: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 STRUCTURAL-FRAMING MATERIALS**

- A. Wood Posts: Manufacturer's standard, 6" x 6" nom. .60 treated minimum requirement.
- B. Wall Girts: Manufacturer's standard, 2" x 6" #2 Spruce, 24" O.C., minimum requirement.
- C. Splash Boards: 2" x 8" treated #2 grade, minimum requirement.
- D. Roof Purlins: Manufacturer's standard, 2" x 4" (on edge), #2 grade, 24" OC, minimum requirement.
- E. Wood Trusses: Manufacturer's standard, pre-engineered, 4:12 (Shop) & 5:12 (Cabins) roof pitch, minimum requirement.
- F. Truss Supports: Manufacturer's standard, 2" x 6" outside, 2" x 4" inside, # 2 grade, minimum requirement.
- G. Miscellaneous: 2" x 6" diagonals at all four corners, 2" x 4" truss ties continuously, full length, # 2 grade:

### **2.2 INSULATION MATERIALS**

- A. Fire-Test-Response Characteristics for Insulation: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
  1. Surface-Burning Characteristics: ASTM E 84.
  2. Fire-Resistance Ratings: ASTM E 119.
  3. Combustion Characteristics: ASTM E 136.

- B. Mineral-Fiber-Blanket Insulation: Thermal insulation combining glass or slag/rock-wool fibers with thermosetting resins, complying with ASTM C 665 and as follows:
  - 1. Type II: Faced one side with nonreflective vapor-retarder membrane.
    - a. Class A: Membrane-faced surface with a flame-spread rating of 25 or less.
    - b. Provide manufacturer's standard 4" thick insulation in walls and roof.
- C. Vapor-Retarder Facing: Complying with ASTM C 1136, with permeance not greater than the following when tested according to ASTM E 96, Desiccant Method:
  - 1. Composition: Vinyl-faced, scrim-reinforced polyester, with permeance not greater than 0.02 perm (1.15 ng/Pa x s x sq. m).
- D. Retainer Strips: 0.019-inch- (0.5-mm-) thick, formed, galvanized steel or PVC retainer clips colored to match insulation facing. Retain one or both subparagraphs below. Coordinate with products specified.

## 2.3 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet Prepainted with factory-applied baked-on coating: Manufacturer's standard Steel sheet metallic coated by the hot-dip process and prepainted to comply with the following requirements:
  - 1. Aluminum-Zinc Alloy-Coated Steel Sheet: G-90 galvalume steel, .9 oz zinc/sf of panel, Kynar 500 coating, minimum standard.
  - 2. Surface: Manufacturer's standard finish.

## 2.4 ROOF PANELS

- A. Lap-Seam Roof Panels: Fabricate from metallic-coated steel sheets prepainted with manufacturer's standard baked-on finish, factory formed to provide manufacturer's standard coverage, with raised trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs for full length of panel. Design panels for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges. Comply with the following:
  - a. Material: Aluminum-zinc alloy-coated steel.
  - b. Metal Thickness: 26 gauge.
  - c. Joint Type: Snap-together type, manufacturer's standard.
- B. Roof Panel Accessories: Provide components required for a complete roof panel assembly including trim, copings, fasciae, mullions, sills, corner units, ridge closures, clips, seam covers, , flashings, gutters, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of roof panels, unless otherwise indicated.
  - 1. Closures: Provide closures at eave and ridge, fabricated of same metal as roof panels.

2. Clips: Minimum 0.0625-inch- (1.6-mm-) thick, stainless-steel panel clips designed to withstand negative-load requirements.
- C. Metallic-Coated Steel Sheet Prepainted with factory-applied baked-on coating: Manufacturer's standard Steel sheet metallic coated by the hot-dip process and prepainted to comply with the following requirements:
1. Aluminum-Zinc Alloy-Coated Steel Sheet: G-90 galvalume steel, .9 oz zinc/sf of panel, Kynar 500 coating, minimum standard.
  2. Colors, Textures, and Glosses: As selected by Architect from manufacturer's full range for these characteristics.
- D. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored backer finish, consisting of prime coat and wash coat with a total minimum dry film thickness of 0.5 mil (0.013 mm).

## 2.5 WALL PANELS

- E. Uninsulated Wall Panels: Provide manufacturer's standard panels complying with the following:
1. Ribbed Panels: Fabricate from metallic-coated steel sheets prepainted with manufacturer's standard baked finish, factory formed to provide manufacturer's standard ) coverage, with raised trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs for full length of panel. Design panels for mechanical attachment to structure using exposed fasteners, lapping major ribs at panel edges. Comply with the following:
    - a. Material: Aluminum-zinc alloy-coated steel.
    - b. Metal Thickness: 26 gauge
- F. Wall Panel Accessories: Provide components required for a complete wall panel assembly, including trim, copings, mullions, sills, corner units, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of panels.
- G. Manufacturer's standard Steel sheet metallic coated by the hot-dip process and prepainted to comply with the following requirements:
1. Aluminum-Zinc Alloy-Coated Steel Sheet: G-90 galvalume steel, .9 oz zinc/sf of panel, Kynar 500 coating, minimum standard.
  2. Colors, Textures, and Glosses: As selected by Architect from manufacturer's full range for these characteristics.

- H. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored backer finish, consisting of prime coat and wash coat with a total minimum dry film thickness of 0.5 mil (0.013 mm).

## 2.6 ACCESSORIES

- A. General: Provide accessories as standard with post-framed building system manufacturer, and complying with the following:
  - 1. Provide sheet metal accessories of same material and in same finish as roof and wall panels, unless otherwise indicated.
- B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of roof or wall sheets by means of plastic caps or factory-applied coating. Comply with the following:
  - 1. Fasteners for Roof Panels: Manufacturer's standard self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM or neoprene sealing washer.
  - 2. Fasteners for Wall Panels: Manufacturer's standard self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with nylon or polypropylene washer.
  - 3. Fasteners for Flashing and Trim: Manufacturer's standard blind fasteners or self-drilling screws with hex washer head.
  - 4. Blind Fasteners: Manufacturer's standard high-strength aluminum or stainless-steel rivets.
- C. Flashing and Trim: Form from Manufacturer's standard, aluminum-zinc alloy-coated steel sheet prepainted with manufacturer's standard baked finish. Provide flashing and trim 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 roof or wall panels.
- D. Closures: Manufacturer's standard flexible closure strips; cut or premolded to match roof and wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- E. Gutters: Form from Manufacturer's standard aluminum-zinc alloy-coated steel sheet prepainted with Manufacturer's standard baked finish. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in Manufacturer's standard sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports Manufacturer's standard spacing to properly secure without deflection., fabricated from same metal as gutters. Provide bronze, copper, or aluminum wire ball strainers at outlets. Finish gutters to match roof fascia and rake trim.

- F. Downspouts: Form from Manufacturer's standard aluminum-zinc alloy-coated steel sheet prepainted with Manufacturer's standard baked finish; in Manufacturer's standard length sections, complete with formed elbows and offsets. Finish downspouts to match wall panels.
- G. Ridge Vents: (3) 8'-0" ridge vents prefinished to match roof. Cable operated, gravity feed. Must be able to open and close.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, with Erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of pole-framed building system.
  - 1. If unacceptable conditions are found, prepare written report, endorsed by Erector, listing conditions detrimental to performance of work and submit to Architect.
  - 2. Proceed with erection only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease, rolling compounds, incompatible primers, and loose mill scale, that impair bond of erection materials.

#### **3.3 ERECTION**

- A. Erect metal building system according to manufacturer's written instructions and erection drawings.

#### **3.4 CLEANING AND PROTECTION**

- A. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
  - 1. Replace panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

### **END OF SECTION 131250**



**SECTION 22 05 00****COMMON WORK RESULTS FOR PLUMBING**

(Edited from DeCA June 2019 Design Criteria)

**GENERAL****1.1 SUMMARY****A. Section Includes:**

1. General administrative and procedural requirements for the plumbing installations.

**B. Related Sections:**

1. General Provisions of the contract, including the following, shall apply to Division 22 Specification Sections: Solicitation Documents and Division 01.
2. Division 03 Polished Concrete Finishing to check pipes prior to polishing slabs.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable.**

1. All work must be performed in accordance with the requirements of current editions of local, county, state and national codes and regulations including the requirements of the latest editions of the following:
  - a. International Building Code.
  - b. National Electrical Code.
  - c. International Plumbing Code.
  - d. International Mechanical Code.
  - e. Occupational Safety and Health Act of 1970.
  - f. For work not specifically listed above, use standards and codes of the National Fire Protection Association.
2. Contractor shall hire a third party to scope all underground plumbing pipes prior to slab polishing to verify that no pipes have been crushed. Report to be approved prior to commencing work on slab polishing.

**1.3 REGULATORY REQUIREMENTS**

1. All equipment, apparatus and systems shall be rated, tested, fabricated and/or installed in accordance with the applicable industry standard mentioned. The following list will serve to clarify abbreviations that appear in other sections of this Specification:
  - a. AABC Associated Air Balance Council
  - b. ADC Air Diffusion Council
  - c. AGA American Gas Association.
  - d. AMCA Air Moving and Conditioning Association

e.	ARI	Air Conditioning and Refrigeration Institute
f.	ANSI	American National Standards Institute
g.	ASE	Association of Safety Engineers
h.	ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineer
i.	ASME	American Society of Mechanical Engineers
j.	AWWA	American Water Works Association
k.	EPA	Environmental Protection Agency
l.	FS	Federal Specifications
m.	IBR	Institute of Boiler and Radiator Manufacturers
n.	IEEE	Institute of Electrical and Electronics Engineers
o.	MCAA	Mechanical Contractors' Association of American
p.	NEMA	National Electrical Manufacturers Association
q.	NFPA	National Fire Protection Association
r.	NSC	National Safety Council
s.	NSF	National Sanitation Foundation
t.	SBI	Steel Boiler Institute Industry
u.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association
v.	UL	Underwriters Laboratories
w.	ASTM	American Society for Testing and Materials.
x.	NEBB	National Environmental Balancing Bureau.

#### 1.4 DEFINITIONS

- A. Furnish: The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation and similar operations.
- B. Install: The term install describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- C. Provide: The term provides means to furnish and install, complete and ready for intended use.

#### 1.5 SHOP DRAWINGS AND SUBMITTALS

- A. See Division 01 Section Quality Control for requirements for Shop Drawings and product data.
- B. Asbestos-Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish the Contracting Officer/Contracting Officer Representative with written certification that the material/product contains no asbestos. This certificate is mandatory before approval will be issued. Submittals furnished without the asbestos-free certification will be returned to the Contractor with no action taken until such certification is provided.
- C. See applicable Sections to this Division for items requiring Shop Drawings.

#### 1.6 MATERIALS AND WORKMANSHIP

- A. Materials, the style, make or quality of which is specifically designated, shall be as specified.
- B. Contractor shall furnish necessary materials in ample quantities and as frequently as required to avoid delay in the progress of the Work, and shall so store them as to prevent interference with other work.

## 1.7 DEFECTIVE WORK AND MATERIAL

- A. All materials or work found to be defective or not in strict conformity with the drawings or different from requirements of the drawings and specifications or defaced or injured through negligence of Contractor or his employees, or through action of fire or weather will be rejected and shall be immediately removed from premises by Contractor and satisfactory materials and work substituted without delay.
- B. All defective work or imperfect work shall be corrected immediately on notice from Government's Designated Representative. No previous inspection or certificate on account shall be held to relieve Contractor from his obligation to furnish sound materials and to perform good and satisfactory work.

## 1.8 COOPERATION AND COORDINATION

- A. Contractor shall confer with other contractors at the site before installing his work to avoid interferences so that maximum head room and clearances may be maintained. In event that interferences develop between work of various contractors, Government's Designated Representative's decision will be final and no additional compensation will be allowed for changes required.
- B. Particular attention shall be paid to situations where recessed equipment, pipes and lights occur, or where the work of several trades occurs together above suspended ceilings, in pipe shafts or in areas where space is limited.
- C. All fixtures, equipment, devices, switches, outlets, pumps, etc., shall be positioned to avoid all interferences with and to assure proper coordination with work of all other trades, cases, partitions, wall, floor and ceiling patterns, architectural features, etc. All recessed devices, fixtures, etc., shall be coordinated with all wall, floor and ceiling patterns. Government's Designated Representative will reconcile conflicts and adjustments where such adjustments are warranted.

## 1.9 PROTECTION OF EQUIPMENT AND SYSTEMS

- A. Contractor shall keep all his respective pipe openings closed by means of plugs or caps to prevent entrance of foreign matter during construction and cover all fixtures, equipment, and apparatus as required to protect them against dirt, water, chemical or mechanical damage both before and after installation. Any such fixtures, equipment or apparatus damaged prior to final acceptance of the Work shall be restored to its original condition or replaced by Contractor at no cost to Government.

## 1.10 CONTRACT DRAWINGS

- A. The layout shown on the Contract Drawings is necessarily diagrammatic but shall be followed as closely as actual construction and as other work will allow. The dimensions of work as shown on the Contract Drawings are not as-built dimensions. No measurements shall be scaled from the Drawings and used as definite dimensions for laying out or fitting work in place.
- B. The layout of manufactured equipment as shown on the drawings shall be checked and the exact location shall be determined from the dimensions of equipment shop drawings approved by the Government's Designated Representative.

**1.11 MAINTENANCE MANUAL AND OPERATING INSTRUCTIONS**

- A. Upon completion of the Work, Contractors shall provide the Government's Designated Representative with three copies of maintenance manual for all equipment furnished and installed under his Work. Manuals shall be in substantial 3-ring binders with project name and number inscribed on face and hinged back. Manual shall include roster of all Government training session attendees. The manual shall, however, first be approved by the Government's Designated Representative.
- B. The manual shall include manufacturer's lubricating and operating instructions and parts list and serial numbers for all operating machinery, including drive information, and motor horsepower, amperage, and voltage readings on all phases, valve chart, sequence of operation, index following the order listed in the specifications, warranties in the name of the Installation, and a list of manufacturers, service firms and subcontractors names and telephone numbers.
- C. Training attendance rosters for each training session shall be included in manuals. Roster will identify training subject, date, attendees name, job title, office symbol, grade/rank, and telephone number.
- D. All switches, controls, and safety devices shall be clearly and permanently marked with embossed or printed plates as to purpose and as to operation and shall be tested in the presence of the Government's Designated Representative to ensure that he understands their function and purpose.
- E. Upon completion of the Work, Contractors shall put the systems into service. Contractors shall be entirely responsible for the equipment during all testing operations including the lubricating and turning on and off of such apparatus.

**1.12 PROJECT RECORD AND CLOSEOUT DOCUMENTS**

- A. Refer to the Division 01 Section CLOSEOUT PROCEDURES for requirements. The following paragraphs supplement the requirements of Division 01.
- B. Mark Drawings to indicate revisions to piping and ductwork, size and location both exterior and interior; including locations of coils, dampers and other control devices, filters, boxes, and similar units requiring periodic maintenance or repair; actual equipment locations, dimensioned for column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned to column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices.
- C. Mark Specifications to indicate addenda, approved substitutions, change orders, actual equipment and materials used.

**1.13 DELIVERY, STORAGE AND HANDLING**

- A. Deliver products to project properly identified with 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 plumbing 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.

#### 1.14 COMMISSIONING

- A. All Plumbing shall comply with the requirements of Division 01 Section GENERAL COMMISSIONING REQUIREMENTS and Division 22 Section COMMISSIONING OF PLUMBING.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 ACCESSIBILITY

- A. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.
- B. Extend all grease fittings to an accessible location.
- C. Refer to the Division 08 Section ACCESS DOORS AND FRAMES.

#### 3.2 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment Specifications in Divisions 11 through 33 for rough-in requirements.

#### 3.3 PLUMBING INSTALLATIONS

- A. General: sequence, coordinate, and integrate the various elements of plumbing systems, materials, and equipment. Comply with the following requirements:
  - 1. Coordinate plumbing equipment and materials installation with other building components.
  - 2. Verify all dimensions by field measurements.
  - 3. Arrange for chases, slots, and openings in other building components to allow for plumbing installation.
  - 4. 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.
  - 5. Sequence, coordinate and integrate installations of plumbing materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
  - 6. Coordinate the cutting and patching of building components to accommodate the installation of plumbing equipment and materials.

7. Where mounting heights are not detailed or dimensioned, install plumbing services and overhead equipment to provide maximum headroom possible.
8. Install plumbing equipment 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.
9. Coordinate the installation of plumbing materials and equipment above ceiling with suspension system, light fixtures, and other installations.
10. Install access panel or doors where units are concealed behind finished surface. Access panels and doors are specified in Division 08 Section Access Doors.
11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
12. Coordinate connection of plumbing systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
13. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Government's Designated Representative.
14. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed expose in finished spaces.

### 3.4 CUTTING AND PATCHING

- A. This Article specifies the cutting and patching of plumbing equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.
- B. Refer to Division 01 Section QUALITY CONTROL for general requirements for cutting and patching.
- C. Refer to Division 26 Electrical for requirements for cutting and patching electrical equipment, components, and materials.
- D. Do not endanger or damage installed Work through procedures and processes of cutting and patching.
- E. Arrange for repairs required to restore other work, because of damage caused as a result of plumbing installations.
- F. No additional compensation will be authorized for cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.
- G. Perform cuttings, fittings, and patching of plumbing equipment and materials required to:
  1. Uncover Work to provide for installation of ill-timed work.
  2. Remove and replace defective work.
  3. Remove and replace Work not conforming to requirements of the Contract Documents.
  4. Remove samples of installed Work as specified for testing.
  5. Upon written instruction from the Government's Designated Representative, uncover and restore Work to provide for Government's Designated Representative's observation of concealed work.
- H. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

### 3.5 CLEANING

- A. Refer to the Division 01 Section CLOSEOUT PROCEDURES for general requirements for final cleaning.
- B. Refer to Division 23 Section TESTING, ADJUSTING, AND BALANCING FOR HVAC for requirements for cleaning filters, strainers, and mechanical systems prior to final acceptance.

END OF SECTION

**SECTION 22 05 19****PLUMBING SPECIALTIES**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Floor drains.
2. Cleanouts.
3. Hose bibs.
4. Hydrants.
5. Backflow preventers.
6. Water hammer arrestors.
7. Thermostatic mixing valves.
8. Water pressure reducing valve.
9. Water meter.
10. Flow meters.
11. Pressure gages.
12. Pressure gage tapings.
13. Thermometers.
14. Thermometer supports.
15. Eyewash fountains.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Government-Furnished Products.
3. Division 01 Section Quality Control.
4. Division 01 Section Closeout Procedures.
5. Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
6. Division 22 Section Plumbing Piping.
7. Division 22 Section Plumbing Fixtures.
8. Division 22 Section Plumbing Equipment.
9. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. ASME A112.21.1 - Floor Drains.
2. ASME A112.21.2 - Roof Drains.
3. ASME A112.26.1 - Water Hammer Arrestors.
4. ASME B40.1 - Gages - Pressure Indicating Dial Type - Elastic Element.
5. ASME MFC-3M - Measurement of Fluid Flow in Pipes Using Orifice, Nozzle and Venturi.
6. ASSE 1011 - Hose Connection Vacuum Breakers.
7. ASSE 1012 - Backflow Preventers with Immediate Atmospheric Vent.
8. ASSE 1013 - Backflow Preventers, Reduced Pressure Principle.



9. ASSE 1019 - Wall Hydrants, Frost Proof Automatic Draining Anti-Backflow Types.
10. ASTM D2458 - Method of Flow Measurement by the Venturi Motor Tube.
11. ASTM E1 - Standard Specification for ASTM Thermometers.
12. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers.
13. AWWA C506 - Backflow Prevention Devices - Reduced Pressure Principle and Double Check Valve Types.
14. ISA RP 3.2 - Flange Mounted Sharp Edged Orifice Plates for Flow Measurement.
15. PDI WH-201 - Water Hammer Arrestors.
16. PDI WH-201 - Water Hammer Arrestors.
17. UL 393 - Indicating Pressure Gauges for Fire-Protection Service.
18. UL 404 - Gages, Indicating Pressure, for Compressed Gas Service.

### 1.3 SUBMITTALS

#### A. Submittals for Review:

1. Division 01 Section Quality Control: Procedures for submittals.
2. Product Data:
  - a. Provide component sizes, rough-in requirements, service sizes, and finishes.
  - b. Meters and Gages: Provide manufacturers data and list which indicates use, operating range, total range, accuracy, and location for manufactured components.
3. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
4. Operation and Maintenance Data.

#### B. Submittals for Information:

1. Division 01 Section Quality Control: Procedures for submittals.
2. Certificates: Certify that grease interceptors meet or exceed specified requirements.
3. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

#### C. Submittals at Project Closeout:

1. Division 01 Section Closeout Procedures.
2. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors, instrumentation, etc.
3. Operation Data: Indicate frequency of treatment required for interceptors.
4. Include instructions for calibrating instruments.
5. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.
6. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

### 1.4 DELIVERY, STORAGE, AND PROTECTION

- A. Accept specialties on site in original factory packaging. Inspect for damage.
- B. Do not install instruments when areas are under construction, except for required rough-in, taps, supports and test plugs.

## 1.5 QUALIFICATIONS

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum three years documented experience.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Products: To establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other manufacturers, a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation. Subject to compliance with requirements, provide either the named products or equal products.

### 2.2 FLOOR DRAINS

- A. See Drawings.

### 2.3 CLEANOUTS

- A. See Drawings.

### 2.4 HOSE BIBS

- A. See Drawings.

### 2.5 HYDRANTS

- A. See Drawings.

### 2.6 BACKFLOW PREVENTERS

- A. Reduced Pressure Backflow Preventers:
  - 1. ANSI/ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two shut-off valves, strainer, and four test cocks.

### 2.7 WATER HAMMER ARRESTORS

- A. ANSI A112.26.1; stainless steel construction, bellows type sized in accordance with PDI WH-201, precharged suitable for operation in temperature range 34 to 250 deg F working pressure.

## 2.8 THERMOSTATIC MIXING VALVES

- A. Valve: Chrome plated cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.
- B. Accessories:
  - 1. Check valve on inlets.
  - 2. Volume control shut-off valve on outlet.
  - 3. Stem thermometer on outlet.
  - 4. Strainer stop checks on inlets.
- C. Cabinet: 16 gage stainless steel, for recessed mounting with keyed lock.

## 2.9 WATER PRESSURE REDUCING VALVE

- A. Acceptable manufacturers:
  - 1. Watts.
  - 2. Spence.
  - 3. Apollo.
- B. Construction:
  - 1. Gate valve before; Gate valve after; Globe valve in bypass; 1/2 inch regulator line, with needle valve, connected 15 feet downstream.

## 2.10 WATER METER

- A. Acceptable Manufacturers:
  - 1. Badger.
  - 2. Neptune.
  - 3. American Meter.
- B. Water Meters:
  - 1. Shall conform to American Water Works Association (AWWA) C700.
  - 2. Meters shall be positive displacement, oscillating piston, or disc nutation type.
  - 3. Features: Magnetic drive with magnetic shielding, straight reading sealed register graduated in cubic feet. All bronze split case, integral strainer, threaded ends, and pulse switch initiator.
  - 4. Meter shall be suitable for accurately measuring and handling water at pressure, temperatures and flow rates to be encountered.
  - 5. Pulse initiator shall provide maximum number of pulses up to 500 per minute that is obtainable from the manufacturer. It shall not provide less than 1-pulse per 100-gallons.

## 2.11 PRESSURE GAGES

- A. Gage: ASME B40.1, UL 393 drawn steel case, phosphor bourdon tube, rotary brass movement, brass socket, front recalibration adjustment, black scale on white background.

- B. Case: Steel with brass bourdon tube or Cast aluminum with phosphor bronze bourdon tube.
- C. Size: 4-1/2 inch.
- D. Dial Size: 4 inch diameter.
- E. Mid-Scale Accuracy: Two percent.
- F. Scale: Psi.

## 2.12 PRESSURE GAGE TAPPINGS

- A. Gage Cock:
  - 1. Tee or lever handle, brass for maximum 150 psig.
- B. Needle Valve:
  - 1. Brass, 1/4 inch NPT for minimum **150 psig**.
- C. Ball Valve:
  - 1. Brass, 1/8 inch NPT 250 psi.
- D. Pulsation Damper:
  - 1. Pressure snubber, brass with 1/4 inch NPT connections.

## 2.13 THERMOMETERS

- A. Stem Thermometer: ASTM E1, adjustable angle, red-reading liquid, lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device. Mercury shall not be used.
  - 1. Size: 7 inch scale.
  - 2. Window: Clear glass or Lexan.
  - 3. Stem: Brass, 6 inch, 3/4 inch NPT.
  - 4. Accuracy: ASTM E77 2 percent.
  - 5. Calibration: Deg F.
- B. Dial Thermometer: ASTM E1, stainless steel case, bimetallic helix actuated with silicone fluid damping, white with black markings and black pointer hermetically sealed lens, stainless steel stem.
  - 1. Size: 3-1/2 inch diameter dial.
  - 2. Lens: Clear Lexan.
  - 3. Accuracy: 1 percent.
  - 4. Calibration: Deg F.

## 2.14 THERMOMETER SUPPORTS

- A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain, to be mounted in piping systems.

- B. Flange: 3 inch outside diameter reversible flange, designed to fasten to sheet metal air ducts, with brass perforated stem.

## 2.15 EYEWASH FOUNTAINS

- A. Faucet Mount Eye Spray:
  - 1. Salient Characteristics:
    - a. Dual stream eye-face wash with faucet attachment.
    - b. Spray Heads: Chrome plated dual stream heads, float off covers secured with polymer strap and chrome plated brass piping.
    - c. Valve: 1/2 inch NPT.
    - d. Activator: Pull tab.
    - e. Inlet: 1/2 inch NPT.
    - f. Flow Rate: 8 gpm at 45 psi.
  - 2. Basis-of-Design Product: Guardian
    - a. G1201 EyeSafe-X

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Locate devices where shown on Drawings and install in accordance with manufacturer's instructions.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, and interior and exterior hose bibs.
- F. Pipe relief from backflow preventer to nearest drain.
- G. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories, sinks, washing machine outlets, and each washroom or group of fixtures.
- H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures. Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.
- I. Install one pressure gage per pump, with taps before strainers and on suction and discharge of pump; pipe to gage with isolating valves.
- J. Install pressure gages with pulsation dampers. Provide gage cock, needle valve or ball valve to isolate each gage. Extend nipples to allow clearance from insulation.

- K. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Ensure sockets allow clearance from insulation.
- L. Install Temperature and Pressure Stations in piping adjacent to controls systems thermostat, transmitter, or sensor sockets.
- M. Locate additional Temperature and Pressure Stations where indicated.
- N. Provide instruments with scale ranges selected according to service with largest appropriate scale.
- O. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

### 3.2 SCHEDULES

- A. Locate devices where shown on drawings and the following locations.

- 1. Pressure Gage Schedule:

LOCATION	SCALE RANGE
Cold Water supply to building	0 - 100 psig
Pumps	0 - 100 psig
Expansion tanks	0 - 100 psig
Pressure reducing valves - at inlet and outlet	0 - 100 psig

- 2. Stem Type Thermometer Schedule - Water Thermometers:

LOCATION	SCALE RANGE
Thermostatic Mixing Valves - three required	50 - 250 deg F
Headers to central equipment	50 - 250 deg F

**END OF SECTION**

**SECTION 22 05 29****HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Pipe and equipment hangers and supports.
2. Equipment bases and supports.
3. Sleeves and seals.
4. Flashing and sealing equipment and pipe stacks.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications for a part of this specification to the extent they are applicable.**

1. Division 01 Section Quality Control.
2. ASME B31.1 - Power Piping.
3. ASME B31.2 - Fuel Gas Piping.
4. ASME B31.5 - Refrigeration Piping.
5. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
6. MSS SP58-2009 - Pipe Hangers and Supports - Materials, Design, Manufacturer, Selection, Application and Installation.
7. NFPA 13 - Installation of Sprinkler Systems.
8. UL 203 - Pipe Hanger Equipment for Fire Protection Service.

**1.3 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for support of plumbing piping.
- B. Supports for Sprinkler Piping: In conformance with NFPA 13.
- C. Supports for Standpipes: In conformance with NFPA 14.

## PART 2 - PRODUCTS

## 2.1 ACCESSORIES

- A. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
- B. Beam clamps shall not be of the set screw type unless they also have a positive means of securing the clamp against horizontal movement, i.e. horizontal j-bolt extending to the opposite flange of the beam or joist or similar device.
- C. Hanger loads of up to 300 pounds can be applied to the top or bottom chord of a bar joist using a threaded rod between the chord angles with washer and double nuts above and below the chord within 6 inches of a panel point. Heavier loads require coordination with the joist manufacturer.

## 2.2 PIPE HANGERS AND SUPPORTS

- A. Plumbing Piping - DWV:
  - 1. Conform to MSS SP58-2009.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
  - 6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
  - 7. Vertical Support: Steel riser clamp.
  - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- B. Plumbing Piping - Water and Natural Gas:
  - 1. Conform to MSS SP58-2009.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
  - 4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
  - 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 6. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
  - 7. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
  - 8. Wall Support for Hot Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
  - 9. Vertical Support: Steel riser clamp.
  - 10. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 11. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 12. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.



## 2.3 INSERTS

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.
- B. Self drilling expansion anchors, powder driven anchors, or other similar devices shall be applied in accord with their manufacturers published ratings and instructions.

## 2.4 FLASHING

- A. Metal Flashing: 26 gage galvanized steel.
- B. Metal Counterflashing: 22 gage galvanized steel.

## 2.5 SLEEVES

- A. Sleeves for Pipes through Non-fire Rated Floors: 18 gage galvanized steel.
- B. Sleeves for Pipes through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gauge galvanized steel.
- C. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, AWL listed.
- D. Sleeves for pipes through foundation walls below grade: Steel pipe or schedule 40 PVC pipe.
- E. Firestopping Insulation: Glass fiber type, non-combustible.
- F. Sealant: Acrylic. See Division 07 Joint Sealants.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
  - 1. Support of all equipment, piping, etc. such that it will withstand a force of 0.5 times its weight in any direction and 1.5 times its weight downward.
  - 2. Do not attach to roof deck, connect to structural members and span between same with structural members, Unistrut, etc.
  - 3. Roof mounted equipment curbs and roof mounting rails shall be installed to withstand the wind and seismic loading required by Division 01 Section Summary of Work.

## 3.2 INSERTS

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

### 3.3 PIPE HANGERS AND SUPPORTS

- A. Support horizontal piping as scheduled.
- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping.
- J. Design hangers for pipe movement without disengagement of supported pipe.

### 3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- B. Construct supports of steel members. Brace and fasten with flanges or plates bolted to structure.
- C. Provide rigid anchors for pipes after vibration isolation components are installed.

### 3.5 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for mechanical roof installations 14 inches high, minimum, above roofing surface. Flash and counterflash with sheet metal; seal watertight. Attach counterflashing and mechanical equipment, and lap base flashing on roof curbs. Flatten and solder joints.
- C. Adjust storm collars tight to pipe with bolts; calk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

## 3.6 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing (fire stopping at fire walls) insulation and caulk air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

## 3.7 HANGER SPACING

HANGER ROD PIPE SIZE Inches	MAX. HANGER SPACING Feet	DIAMETER Inches
1/2 to 1-1/4	6.5	3/8
1-1/2 to 2	10	3/8
2-1/2 to 3	10	1/2
4 to 6	10	5/8
8 to 12	14	7/8
14 and Over	20	1
PVC (All Sizes)	6	3/8
C.I. Bell and Spigot (or No-Hub) and at Joints	5	As above

END OF SECTION

**SECTION 22 05 53****IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Nameplates.
2. Tags.
3. Stencils.
4. Pipe Markers.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ASME A13.1 - Scheme for the Identification of Piping Systems.

**PART 2 - PRODUCTS****2.1 NAMEPLATES**

- A. Description:** Laminated three-layer plastic with engraved black letters on light contrasting background color, 4 inch by 1-1/2 inch or larger.

**2.2 TAGS**

- A. Plastic Tags:** Laminated three-layer plastic, brass, or aluminum with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch.
- B. Chart:** Typewritten letter size list in anodized aluminum frame.

## 2.3 PIPE MARKERS

- A. Color: Conform to ASME A13.1.
- B. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

## 2.4 STENCILS

- A. Stencils: With clean cut symbols and letters of following size:
  - 1. Up to 2 Inch Outside Diameter of Insulation or Pipe: 1/2-inch high letters.
  - 2. 2-1/2 to 6 Inches Outside Diameter of Insulation or Pipe: 1-inch high letters.
  - 3. Over 6 Inches Outside Diameter of Insulation or Pipe: 1-3/4 inches high letters.
- B. Stencil Paint: As specified in Division 09 Section Painting and Coating, semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

## 2.5 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1.
- B. Preformed plastic markers.
  - 1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers:
  - 1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

## 2.6 CEILING TACKS

- A. Description: Steel with 3/4 inch diameter color coded head.
- B. Color code as follows:
  - 1. Green - Plumbing equipment or valve.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

- B. Prepare surfaces in accordance with Division 09 Section Painting and Coating for stencil painting.

### 3.2 INSTALLATION

- A. Install identifying devices after completion of covering and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- C. Install tags with corrosion resistant chain.
- D. Apply stencil painting in accordance with Division 09 Section Painting and Coating.
- E. Install plastic pipe markers in accordance with manufacturer's instructions.
- F. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- G. Identify pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify valves in main and branch piping with tags.
- J. Tag automatic controls, instruments, and relays. Key to control schematic.
- K. Identify piping, concealed or exposed, with plastic pipe markers or plastic tape pipe markers. Delete markers on piping 3/4 inch diameter and smaller. Identify service and flow direction. Install in clear view and align with axis of piping. Locate identification not to exceed 50 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
- L. Provide ceiling tacks to locate equipment or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

### END OF SECTION

**SECTION 22 07 19****PLUMBING PIPING INSULATION**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Piping insulation.
2. Jackets and accessories.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
5. Division 22 Section Identification for Plumbing Piping and Equipment.
6. Division 23 Section HVAC Piping Insulation.

**1.2 PERFORMANCE REQUIREMENTS**

- A. Materials:** Flame spread/smoke developed rating of 25/50 or less in accordance with NFPA 255 and UL 723.
- B. All materials and insulating values shall comply with the International Energy Conservation Code.**

**1.3 QUALITY CONTROL****A. The following publications form a part of this specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot Plate Apparatus.
3. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement.
4. ASTM C449/C449M - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement.
5. ASTM C518 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
6. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation.
7. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
8. ASTM C547 - Standard Specification for Mineral Fiber Preformed Pipe Insulation.
9. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation.

10. ASTM C578 - Standard Specification for Preformed, Cellular Polystyrene Thermal Insulation.
11. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
12. ASTM C610 - Standard Specification for Expanded Perlite Block and Pipe Thermal Insulation.
13. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
14. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation.
15. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
16. ASTM D1667 - Standard Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
17. ASTM D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
18. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
19. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
20. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
21. NAIMA National Insulation Standards. North American Insulation Manufacturer's Association.
22. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
23. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

#### 1.4 SUBMITTALS

##### A. Submittals for review:

1. Submit under provisions of Division 01 Section Quality Control.
2. Product Data: Provide product data for each type of mechanical insulation identifying k-value, thickness, jackets (factory and field applied) and accessories.
3. Operation and Maintenance Data.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 Section Environmental Management.
- B. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic.
- D. Protect insulation against dirt, water, chemical, and mechanical damage.
- E. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- F. Maintain temperature during and after installation for minimum period of 24 hours.



## 1.6 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this section with minimum three years experience.

## PART 2 - PRODUCTS

### 2.1 GLASS FIBER

- A. Insulation:
  - 1. Preformed Pipe Insulation, ASTM C547; rigid molded, noncombustible.
  - 2. 'K' Value: ASTM C177, 0.27 at compressed thickness and 75 deg F.
  - 3. Density: 0.75 lb/cu-ft.
  - 4. Maximum Service Temperature: 850 deg F.
- B. Vapor Barrier Jacket:
  - 1. ASTM C921, white kraft paper with glass fiber yarn, bonded to aluminized film.
  - 2. Moisture Vapor Transmission: ASTM E96; 0.02 perm-inches.
- C. Tie Wire:
  - 1. 16-gauge soft annealed stainless steel with twisted ends on maximum 12 inch centers.
- D. Vapor Barrier Lap Adhesive:
  - 1. Compatible with insulation.
- E. Fibrous Glass Fabric:
  - 1. Cloth: Untreated; 9 oz/sq yd weight.
  - 2. Blanket: 1.0 lb/cu ft density.

### 2.2 JACKETS

- A. PVC Plastic:
  - 1. Jacket: ASTM D1784, One piece molded type fitting covers and sheet material, off-white color.
    - a. Minimum service temperature: 0 deg F.
    - b. Maximum service temperature: 150 deg F.
    - c. Moisture vapor transmission: ASTM E96; 0.002 perm-inches.
    - d. Thickness: 10 mil.
    - e. Connections: Brush on welding adhesive or Pressure sensitive color matching vinyl tape.

## 2.3 CELLULAR FOAM

- A. Insulation: ASTM C534; flexible, cellular elastomeric, molded or sheet.
1. 'K' ('ksi') Value: ASTM C177 or C518; 0.27 at 75 deg F.
  2. Minimum Service Temperature: -40 deg F.
  3. Maximum Service Temperature: 220 deg F.
  4. Maximum Moisture Absorption: ASTM D1056; 1.0 percent (pipe) by volume, 1.0 percent (sheet) by volume.
  5. Moisture Vapor Transmission: ASTM E96; 0.20 perm inches.
  6. Maximum Flame Spread: ASTM E84; 25.
  7. Maximum Smoke Developed: ASTM E84; 50.
  8. Connection: Waterproof vapor barrier adhesive.
- B. Elastomeric Foam Adhesive:
1. Air dried, contact adhesive, compatible with insulation.

\*\*\*\*FOR AREAS OF EXTREME HUMIDITY ONLY\_80 degrees wb and higher\*\*\*\*

## 2.4 WICKING PIPE INSULATION

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
1. 'K' ('Ksi') Value: ASTM C177, 0.24 at 75 deg F.
  2. Service Temperature: 35 to 70 deg F pipe temperature.
  3. Maximum Moisture Absorption: 0.2 percent by volume.
  4. Flame Spread/Smoke Developed: 25/50.
  5. Wicking material lining core and extending to the surface of the pipe facing.
- B. Jacket:
1. White all serviceable jacket with evaporation holes, cap seal joints and butt strips, no staples.
  2. Permeance: 0.4 perms maximum.
- C. Premolded Fittings:
1. Insulation shall be "Permawick" by Knauf or equal.

## 2.5 ADHESIVES

- A. Flexible Elastomeric Cellular Insulation Adhesive: Solvent-based, contact adhesive recommended by insulation manufacturer. Comply with MIL-A-24179A, Type II, Class 1.

## 2.6 JACKET FOR EXTERIOR PIPE INSULATION

- A. Fiberglass insulation installed outdoors and subject to water damage shall be provided with an additional 0.016 inch aluminum jacket with lock seam longitudinal joint and stainless steel "Bandit" straps for butted joints as required for a water-tight installation.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

**3.2 INSTALLATION****A. General:**

- 1. Install materials in accordance with manufacturer's instructions.
- 2. On exposed piping, locate insulation and cover seams in least visible locations.
- 3. Finish insulation at supports, protrusions, and interruptions.
- 4. For exterior applications, finish insulation with two coats of ultraviolet resistant finish as recommended by the manufacturer.
- 5. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
- 6. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- 7. Finish at supports, protrusions, and interruptions.
- 8. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces Less Than 10 feet Above Finished Floor: Finish with **PVC jacket and fitting covers**.
- 9. Install aluminum jacket on piping out of doors.

**B. Installation: Glass fiber insulated pipes conveying fluids below ambient temperature:**

- 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
- 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

**C. Installation: Hot piping conveying fluids 140 deg F or less, insulate flanges and unions at equipment completely. Bevel and seal ends of insulation.**

- 1. For hot piping conveying fluids over 140 deg F, insulate flanges and unions at equipment.
- 2. Glass fiber insulated pipes conveying fluids above ambient temperature:
  - a. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
  - b. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

**D. Cellular foam insulation:**

- 1. All longitudinal and butt joints shall be fully glued and sealed.

**E. Installation: Wicking pipe insulation:**

1. Install in accordance with NAIMA National Insulation Standards and Knauf installation instructions.
2. Where insulation is indicated to be replaced, remove existing insulation. Allow piping to warm to above the dew point and to dry thoroughly before applying new insulation. Coordinate with the Commissary Officer to schedule work for times when the Commissary is closed.
3. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with PVC fitting covers. Install wicking material as directed by manufacturer.
4. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Division 07 Section Firestopping.
5. Install jacket with evaporation holes aligned with wicking material at the bottom of the pipe.

F. Inserts and Shields:

1. Application: Piping 2-inch diameter or larger.
  - a. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
  - b. Insert location: Between support shield and piping and under the finish jacket.
  - c. Insert configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
  - d. Insert material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

### 3.3 TOLERANCE

- A. Substituted insulation materials shall provide thermal resistance within 10 percent at normal conditions, as materials indicated.

### 3.4 CELLULAR FOAM INSULATION SCHEDULE

PIPING SYSTEMS	PIPE SIZE Inch	THICKNESS Inch
A. Plumbing Piping:		
Domestic Hot Water, Hot Recirculated:	1-½ and larger	1-½ inch
	1-¼ and less	½ inch
Domestic Cold Water:	1 and smaller	½ inch
	1-¼ to 4	1 inch
	Larger than 4	1-½ inch
Roof Drains:	All	½ inch

**3.5 GLASS FIBER INSULATION SCHEDULE**

	PIPING SYSTEMS	PIPE SIZE	THICKNESS
		Inch	Inch
A.	Roof drain bodies, horizontal downspouts above grade, and vertical downspouts from drains to horizontal downspouts:		
		All	1 inch

**3.6 EXTERIOR PIPE INSULATION**

- A. Insulation installed outdoors shall be provided with an additional 0.016 inch aluminum jacket with lock seam longitudinal joint and stainless steel "Bandit" straps for butted joints as required for a water-tight installation.

**END OF SECTION**

**SECTION 22 10 00****PLUMBING PIPING**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Pipe, pipe fittings, valves, and connections for piping systems.
  - a. Sanitary sewer.
  - b. Domestic water.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 07 Thermal and Moisture Protection.
5. Division 08 Section Access Doors and Frames.
6. Division 33 Section Water Distribution.
7. Division 33 Section Sanitary Sewers.
8. Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
9. Division 22 Section Plumbing Piping Insulation.
10. Division 22 Section Identification for Plumbing Piping and Equipment.
11. Division 26 Electrical.
12. Division 31 Section Earthwork.
13. Division 33 Section Storm Drainage Utilities.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. AGA Z21.22 - Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems.
3. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800.
4. ASME B16.3 - Malleable Iron Threaded Fittings.
5. ASME B16.4 - Cast Iron Threaded Fittings Class 125 and 250.
6. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
7. ASME B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.
8. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.
9. ASME B16.26 - Cast Bronze Fittings for Flared Copper Tubes.
10. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
11. ASME B31.2 - Fuel Gas Piping.

12. ASME B31.9 - Building Service Piping.
13. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
14. ASTM A74 - Cast Iron Soil Pipe and Fittings.
15. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
16. ASTM B32 - Solder Metal.
17. ASTM B42 - Seamless Copper Pipe.
18. ASTM B88 - Seamless Copper Water Tube.
19. ASTM B306 - Copper Drainage Tube (DWV).
20. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
21. ASTM D1785 - Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
22. ASTM D2235 - Solvent Cement for Acrylonitrile - Butadiene - Styrene (ABS) Plastic Pipe and Fittings.
23. ASTM D2239 - Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
24. ASTM D2447 - Polyethylene (PE) Plastic Pipe Schedules 40 and 80, Based on Outside Diameter.
25. ASTM D2466 - Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.
26. ASTM D2564 - Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings.
27. ASTM D2661 - Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings.
28. ASTM D2665 - Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
29. ASTM D2683 - Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe.
30. ASTM D2729 - Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
31. ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
32. ASTM D2855 - Making Solvent-Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings.
33. ASTM D3034 - Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
34. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
35. ASTM F679 - Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
36. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary Systems.
37. CISPI 310 - Joints for Hubless Cast Iron Sanitary Systems.
38. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
39. MSS SP-67 - Butterfly Valves.
40. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
41. MSS SP-70 - Cast Iron Gate Valves, Flanged and Threaded Ends.
42. MSS SP-71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
43. MSS SP-78 - Cast Iron Plug Valves, Flanged and Threaded Ends.
44. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.
45. MSS SP-85 - Cast Iron Globe & Angle Valves, Flanged and Threaded Ends.
46. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
47. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
48. NFPA 54 - National Fuel Gas Code.

### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with applicable codes and standards.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Welding Materials and Procedures: Conform to ASME SEC IX and applicable state labor regulations.

- D. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

#### 1.4 SUBMITTALS

##### A. Submittals for Review:

1. Division 01 Section Quality Control: Procedures for submittals.
2. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
3. Operation and Maintenance Data.

##### B. Submittals at Project Closeout:

1. Division 01 Section Closeout Procedures.
2. Project Record Documents: Record actual locations of valves.
3. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at Contract closeout.

#### 1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Division 01 Section Quality Control: Transport, handle, store, and protect products.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

#### 1.6 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with International Plumbing Code (IPC) and International Fuel Gas Code (IFGC).
- B. Conform to applicable code for installation of backflow prevention devices.
- C. Provide certificate of compliance indicating approval of installation of backflow prevention devices.
- D. Install gas piping and equipment in accord with NFPA 54 and the IFGC.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 Section Quality Control: Environmental conditions affecting products on site.
- B. Do not install underground piping when bedding is wet or frozen.



**1.8 EXTRA MATERIALS**

- A. Division 01 Section Closeout Procedures.
- B. Provide two repacking kits for each size valve.

**PART 2 - PRODUCTS****2.1 SANITARY SEWER PIPING, BURIED BEYOND 5 FEET OF BUILDING**

- A. See Division 33 Section Sanitary Sewers.

**2.2 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING**

- A. Cast Iron Pipe: ASTM A74 weight.
  - 1. Fittings: Cast iron.
  - 2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.
- B. Cast Iron Pipe: CISPI 301, hubless.
  - 1. Fittings: Cast iron.
  - 2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.

**2.3 SANITARY SEWER PIPING, ABOVE GRADE**

- A. Sanitary Sewer Piping, Above Grade, Exposed Locations:
  - 1. Cast Iron Pipe 2 Inches and Larger: CISPI 301, hubless, service weight.
    - a. Fittings: Cast iron.
    - b. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
  - 2. Copper Tube 1-1/2 Inches and Smaller: ASTM B306, DWV Type L, M.
    - a. Fittings: ASME B16.23, cast bronze, or ASME B16.29, wrought copper.
    - b. Joints: ASTM B32, solder, Grade 50B.
- B. Sanitary Sewer Piping Above Grade, Concealed Locations:
  - 1. ABS Pipe: ASTM D2751:
    - a. Fittings: ABS.
    - b. Joints: ASTM D2235, solvent weld.
  - 2. PVC Pipe: ASTM D2665 or ASTM D3034:
    - a. Fittings: PVC.
    - b. Joints: ASTM D2885, solvent weld with ASTM D2564 solvent cement.

## 2.4 WATER PIPING

### A. Water Piping, Buried Beyond 5 Feet of Building:

1. See Division 33 Section Water Distribution.

### B. Water Piping, Buried Within 5 Feet of Building:

1. Copper Tubing: ASTM B42, hard drawn or annealed, Type K.
  - a. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
  - b. Joints: AWS A5.8, BCuP silver braze.

### C. Water Piping, Above Grade:

1. Copper Tubing: ASTM B88 Type L, hard drawn.
  - a. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - b. Joints: ASTM B32, solder, Grade 95TA.

## 2.5 FLANGES, UNIONS, AND COUPLINGS

### A. Pipe Sizes 1 Inch and Under:

1. Ferrous Pipe: Class 150 malleable iron threaded unions.
2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

### B. Pipe Sizes Over 1 Inch:

1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

### C. Grooved and Shouldered Pipe End Couplings:

1. Housing: Malleable iron clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; steel bolts, nuts, and washers; galvanized for galvanized pipe.
2. Sealing Gasket: "C" shape composition sealing gasket.

### D. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

## 2.6 PIPE HANGERS AND SUPPORTS

### A. Plumbing Piping - Drain, Waste, and Vent:

1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or carbon steel, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.

4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
6. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
7. Vertical Support: Steel riser clamp.
8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

B. Plumbing Piping: Water and natural gas.

1. Conform to ASME B31.9.
2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
5. Hangers for Hot Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron pipe roll, double hanger.
6. Multiple or Trapeze Hangers: Steel channels with welded supports or spacers and hanger rods.
7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 Inches and Over: Steel channels with welded supports or spacers and hanger rods, cast iron roll.
8. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
9. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
10. Wall Support for Hot Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.
11. Vertical Support: Steel riser clamp.
12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
13. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
14. Floor Support for Hot Pipe Sizes 6 Inches and Over: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.
15. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

## 2.7 GATE VALVES

A. Up To and Including 3 Inches:

1. MSS SP-80, Class 150, bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge disc, solder or threaded ends.

## 2.8 GLOBE VALVES

A. Up To and Including 3 Inches:

1. MSS SP-80, Class 125, bronze body, bronze trim, handwheel, bronze disc, solder or threaded ends.

## 2.9 BALL VALVES

- A. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, bronze, two piece body, chrome plated brass ball, regular port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle, solder or threaded ends.

## 2.10 PLUG VALVES

- A. Construction 2-1/2 Inches and Larger: MSS SP-78, 175 psi, cast iron body and plug, pressure lubricated, Teflon or Buna N packing, flanged or grooved ends. Provide lever operator with set screw.

## 2.11 BUTTERFLY VALVES

- A. Construction 2 inches or Less: MSS SP-67, 200 psi, bronze iron body, bronze disc, resilient replaceable seat, extended neck, lever handle.

## 2.12 SWING CHECK VALVES

- A. Up to and Including 3 Inches:
  - 1. MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder or threaded ends.
- B. 2 Inches and Larger:
  - 1. MSS SP-71, Class 125, iron body, bronze swing disc, renewable disc seal and seat, flanged or grooved ends.

## 2.13 RELIEF VALVES

- A. Pressure Relief:
  - 1. AGA Z21.22 certified, bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated.
- B. Temperature and Pressure Relief:
  - 1. AGA Z21.22 certified, bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F, capacity ASME SEC IV certified and labeled.

## 2.14 STRAINERS

- A. Size 2 Inch and Under:
  - 1. Threaded brass body for Class 150, threaded bronze body, Y pattern with 1/32 inch stainless steel perforated screen.
- B. Size 1-1/2 Inch to 4 Inch:

1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Division 01 Section Administrative Requirements for verification of existing conditions before starting work.
- B. Verify that excavations are to required grade, dry, and not over-excavated.

#### **3.2 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

#### **3.3 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. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Division 22 Section Plumbing Piping Insulation.
- H. Provide access where valves and fittings are not exposed.
- I. Establish elevations of buried piping outside the building to ensure not less than 5 foot of cover.
- J. Install vent piping penetrating roofed areas to maintain integrity of roof assembly; refer to Division 07 for Roofing.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- L. Provide support for utility meters in accordance with requirements of utility companies.
- M. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Division 09 Section Painting and Coating.

- N. Excavate in accordance with Division 31 Section Earthwork for work of this Section.
- O. Backfill in accordance with Division 31 Section Earthwork for work of this Section.
- P. Install bell and spigot pipe with bell end upstream.
- Q. Install valves with stems upright or horizontal, not inverted.
- R. Install water piping to ASME B31.9.
- S. Sleeve pipes passing through partitions, walls and floors.
- T. Inserts:
  - 1. Provide inserts for placement in concrete formwork.
  - 2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
  - 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
  - 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
  - 5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.
- U. Pipe Hangers and Supports:
  - 1. Install in accordance with ASTM B31.9.
  - 2. Support horizontal piping as scheduled.
  - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 4. Place hangers within 12 inches of each horizontal elbow.
  - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 6. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
  - 7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  - 8. Provide copper plated hangers and supports for copper piping or sheet lead packing between hanger or support and piping.
  - 9. Prime coat exposed steel hangers and supports. Refer to Division 09 Section Painting and Coating. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
  - 10. Provide hangers adjacent to motor driven equipment with vibration isolation; refer to Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
  - 11. Support cast iron drainage piping at every joint.

### 3.4 APPLICATION

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

- D. Install gate ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- E. Install globe ball or butterfly valves for throttling, bypass, or manual flow control services.
- F. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.
- G. Provide flow controls in water recirculating systems where indicated.

### 3.5 ERECTION TOLERANCES

- A. Division 01 Section Quality Control for tolerances.
- B. Establish invert elevations, slopes for drainage to 1/4 inch per foot for pipe 3 inches and smaller, 1/8 inch per foot for larger pipes. Maintain gradients.
- C. Slope water piping minimum 0.25 percent and arrange to drain at low points.

### 3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed and clean.
- B. Ensure Ph of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80.09 ppm residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25.02 ppm, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.00 ppm.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

### 3.7 SERVICE CONNECTIONS

- A. See Division 22 Section Facility Water Distribution.

### 3.8 SCHEDULES

- A. Pipe Hanger Spacing:

#### 1. Metal Piping:

Pipe Size	Maximum Hanger Spacing, Ft.	Rod Size, Inches
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1/2 to 1-1/4 inches:	6.5	3/8
1/2 to 1-1/4 inches:	10	3/8
2-1/2 to 3 inches:	10	1/2
4 to 6 inches:	10	5/8
8 to 12 inches:	14	3/8
14 inches and Over:	20	1

2. Plastic Piping:

Pipe Size	Maximum Hanger Spacing, Ft.	Rod Size, Inches
All Sizes:	6	3/8

3.9 TESTING

- A. Hydrostatically test water mains at 150 psi.
- B. Air pressure test water mains at 150 psi.
- C. Storm and Sanitary: Test at 10 foot water column.

**END OF SECTION**



**SECTION 22 30 00****PLUMBING EQUIPMENT**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Water heaters.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment, and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
5. Division 22 Section Vibration and Seismic Controls for Plumbing Piping and Equipment.
6. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ASHRAE 90A - Energy Conservation in New Building Design.
3. ASME Section 8D - Pressure Vessels.
4. NFPA 30 - Flammable and Combustible Liquids Code.
5. NFPA 54 - National Fuel Gas Code.
6. NFPA 70 - National Electrical Code.

**1.3 SUBMITTALS****A. Submittals for Review:**

1. Division 01 Section Quality Control: Procedures for submittals.
2. Product Data:
  - a. Provide dimension drawings of water heaters indicating components and connections to other equipment and piping.
  - b. Indicate pump type, capacity, and power requirements.
  - c. Provide certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.
  - d. Provide electrical characteristics and connection requirements.
3. Shop Drawings:

- a. Indicate heat exchanger dimensions, size of tappings, and performance data.
  - b. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.
4. Operation and Maintenance Data.
- B. Submittals For Information:
  1. Division 01 Section Quality Control for procedures for submittals.
  2. Manufacturer's Instructions.
- C. Submittals at Project Closeout:
  1. Division 01 Section Closeout Procedures.
  2. Project Record Documents: Record actual locations of components.
  3. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
  4. Warranty: Submit water heater manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
  5. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum five years documented experience.
- B. Provide pumps with manufacturer's name, model number, and rating/capacity identified.
- C. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:
  1. American Gas Association (AGA).
  2. National Sanitation Foundation (NSF).
  3. American Society of Mechanical Engineers (ASME).
  4. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
  5. National Electrical Manufacturers' Association (NEMA).
  6. Underwriters Laboratories (UL).
- D. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation; operate within 25 percent of midpoint of published maximum efficiency curve.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to AGA, NSF, NFPA 54 requirements for water heaters.
- B. Conform to ASME Section 8D for tanks.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

**1.6 DELIVERY, STORAGE, AND PROTECTION****A. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.**

1. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

**1.7 WARRANTY****A. Division 01 Section Closeout Procedures.**

1. Provide five year manufacturer warranty for domestic water heaters and water storage tanks.

**PART 2 - PRODUCTS****2.1 COMMERCIAL ELECTRIC WATER HEATERS**

- A. Type: Factory-assembled and wired, electric, vertical, horizontal storage.
- B. Tank: Glass lined welded steel; thermally insulated with minimum 2 inches, glass fiber or polyurethane encased in corrosion-resistant steel jacket; baked-on enamel finish.
- C. Controls: Automatic immersion water thermostat; externally adjustable temperature range from 60 to 180 deg F flanged or screw-in nichrome elements, high temperature limit thermostat.
- D. Accessories: Brass water connections and dip tube, drain valve, magnesium anode, and ASME rated temperature and pressure relief valve.

**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Install equipment in accordance with manufacturer's instructions and to AGA requirements.
- B. Coordinate with plumbing piping and related fuel piping, gas venting, and electrical work to achieve operating system.
- C. Wire circulating pump controls.

**END OF SECTION**

## SECTION 22 40 00

### PLUMBING FIXTURES

(Edited from DeCA June 2019 Design Criteria)

#### PART 1 - GENERAL

##### 1.1 SUMMARY

###### A. Section Includes:

1. Water closets.
2. Lavatories.
3. Sinks.

###### B. Related Sections:

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 06 Section Interior Architectural Woodwork: Preparation of counters for sinks.
5. Division 07 Section Joint Sealants: Seal fixtures to walls and floors.
6. Division 22 Section Common Work Results for Plumbing.
7. Division 22 Section Hangers and Supports for Plumbing Piping and Equipment.
8. Division 22 Section Plumbing Equipment.
9. Division 26 Electrical.

##### 1.2 QUALITY CONTROL

###### A. The following publications form a part of this specification to the extent they are applicable:

1. Division 01 Section Quality Control.
2. ANSI Z358.1 - Emergency Eye Wash and Shower Equipment.
3. ARI 1010 - Drinking Fountains and Self-Contained Mechanically Refrigerated Drinking Water Coolers.
4. ASME A112.6.1 - Supports for Off-the-Floor Plumbing Fixtures for Public Use.
5. ASME A112.18.1 - Finished and Rough Brass Plumbing Fixture Fittings.
6. ASME A112.19.1 - Enameled Cast Iron Plumbing Fixtures.
7. ASME A112.19.2 - Vitreous China Plumbing Fixtures.
8. ASME A112.19.4 - Porcelain Enameled Formed Steel Plumbing Fixtures.
9. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks, and Urinals.
10. NFPA 70 - National Electrical Code.

##### 1.3 SUBMITTALS

###### A. Submittals for Review:

1. Division 01 Section Quality Control: Procedures for submittals.

2. Product Data: Provide catalog illustrations of fixtures, electric/electronic controls for lavatories and flush valves, sizes, rough-in dimensions, utility sizes, trim, and finishes.
3. Operation and Maintenance Data.

B. Submittals For Information:

1. Division 01 Section Quality Control for submittals.
2. Manufacturer's Instructions: Indicate installation methods and procedures.

C. Submittals At Project Closeout:

1. Division 01 Section Closeout Procedures for submittals.
2. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
3. Warranty: Submit manufacturer warranty and ensure forms have been completed in Government's name and registered with manufacturer.
4. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at Contract closeout.

#### 1.4 DELIVERY, STORAGE, AND PROTECTION

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

#### 1.5 QUALIFICATIONS

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum five years documented experience.

#### 1.6 REGULATORY REQUIREMENTS

- A. International Plumbing code, IPC.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

#### 1.7 WARRANTY

- A. Division 01 Section Closeout Procedures.
- B. Provide five year manufacturer warranty for electric water cooler and water heater.

### PART 2 - PRODUCTS

#### 2.1 TANK TYPE WATER CLOSET

- A. Water Closet:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Kohler.
  - b. American Standard.
  - c. Eljer.
  - d. Crane.
  - e. Mansfield.
  - f. Zurn.
2. Description: Floor-mounting, Elongated, one piece, vitreous-china fixture..
  - a. Internal Design: Diaphragm operation.
  - b. Bowl Type: Elongated with siphon-jet design.
  - c. Style: One piece.
  - d. Internal Design: Diaphragm operation.
  - e. Style: Exposed.
  - f. Inlet Size: NPS per mfr.
  - g. Trip Mechanism: Paddle handle.
  - h. Consumption: 1.6 gal./flush.
  - i. Tailpiece Size: NPS 1-1/2.
  - j. Seat: Elongated, White, Open front, Without cover, Molded or solid plastic, with antimicrobial agent, and check hinge.

## 2.2 LAVATORIES

### A. Lavatories:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Standard Companies, Inc.
  - b. Commercial Enameling Company.
  - c. American Standard Companies, Inc.
  - d. Briggs Plumbing Products, Inc.
  - e. Crane Plumbing, L.L.C./Fiat Products.
  - f. Eljer.
  - g. Gerber Plumbing Fixtures LLC.
  - h. Kohler Co.
  - i. Mansfield.
  - j. Sterling Plumbing Group, Inc.
  - k. TOTO USA, Inc.
  - l. Zurn.
2. Description: Accessible, wall-mounting, vitreous-china fixture.
  - a. Type: Ledge back.
  - b. Color: White.
  - c. Faucet: .5 gpm, battery powered.
  - d. Mixing valve: .5 gpm, with separate stops, and ASSE 1017 & 1070 rated.
  - e. Supplies: NPS 3/8 chrome-plated copper with stops.
  - f. Drain: Grid.
  - g. Protective Shielding Guard(s): White, molded vinyl, ADA compliant.

- h. Fixture Support: Type II, lavatory carrier with concealed arms and tie rod for wall-mounting, lavatory-type fixture. Include steel uprights with feet.

## 2.3 COMMERCIAL SINKS

### A. Commercial Sinks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Advance Tabco.
  - b. AERO Manufacturing, Inc.
  - c. Amtekco Industries, Inc.
  - d. Elkay Manufacturing Co.
  - e. Just Manufacturing Company.
  - f. Mansfield.
  - g. Marlo Manufacturing.
  - h. Metal Masters Foodservice Equipment Co., Inc.
  - i. Zurn.
2. Description: Freestanding, stainless-steel commercial sink with backsplash.
  - a. Metal Thickness: 14 gauge ( 0.078-inch.)
  - b. Each Compartment:
    - 1) Drain: Grid with NPS 2 tailpiece and twist drain.
      - a) Location: Centered in compartment.
  - c. Drainboard(s): Left or right side(s) as shown or scheduled.
  - d. Compartments: 1, 2, or 3 as shown or scheduled.
  - e. Supports: Adjustable-length, steel legs.
  - f. Faucet(s): Back mounted, chrome plated, 12 inch swing spout, 2.2 gpm with quarter-turn handles and index buttons.
    - 1) Number Required: One, two, or more as scheduled.
    - 2) Mounting: In backsplash.
  - g. Supplies: NPS 1/2 chrome-plated copper with stops or shutoff valves.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Division 01 Section Administrative Requirements for verification of existing conditions before starting work.
- B. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- C. Verify that electric power is available and of the correct characteristics.

- D. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

### 3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

### 3.3 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall carriers and bolts.
- E. Seal fixtures to wall and floor surfaces with sealant as specified in Division 07 Section Joint Sealants, color to match fixture.
- F. Water closets are specified as wall-hung.

### 3.4 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork Shop Drawings. Confirm location and size of fixtures and openings before rough-in and installation.

### 3.5 ADJUSTING

- A. Division 01 Section Closeout Procedures: Adjusting installed work.
- B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

### 3.6 CLEANING

- A. Division 01 Section Closeout Procedures for cleaning installed work.
- B. Clean plumbing fixtures and equipment.

### 3.7 PROTECTION OF FINISHED WORK

- A. Division 01 Section Closeout Procedures for Protecting installed work.
- B. Do not permit use of fixtures, during construction.



**END OF SECTION**

**SECTION 23 05 00****COMMON WORK RESULTS FOR HVAC**

(Edited from DeCA June 2019 Design Criteria)

**1.1 SUMMARY****A. Section Includes:**

1. Section includes general requirements for heating, ventilating, air conditioning, and refrigeration.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable.**

1. All work must be performed in accordance with the requirements of current editions of local, county, state and national codes and regulations including the requirements of the latest editions of the following:
  - a. International Building Code.
  - b. National Electrical Code.
  - c. International Plumbing Code.
  - d. International Mechanical Code.
  - e. Occupational Safety and Health Act of 1970.
  - f. For work not specifically listed above, use standards and codes of the National Fire Protection Association.

**1.3 REGULATORY REQUIREMENTS**

1. All equipment, apparatus and systems shall be rated, tested, fabricated and/or installed in accordance with the applicable industry standard mentioned. The following list will serve to clarify abbreviations that appear in other Sections of this Specification:
  - a. AABC Associated Air Balance Council
  - b. ADC Air Diffusion Council
  - c. AGA American Gas Association
  - d. AMCA Air Moving and Conditioning Association
  - e. ARI Air Conditioning and Refrigeration Institute
  - f. ANSI American National Standards Institute
  - g. ASE Association of Safety Engineers
  - h. ASHRAE American Society of Heating, Refrigerating and Air Conditioning Engineer
  - i. ASME American Society of Mechanical Engineers
  - j. AWWA American Water Works Association
  - k. EPA Environmental Protection Agency
  - l. FS Federal Specifications
  - m. IBR Institute of Boiler and Radiator Manufacturers
  - n. IEEE Institute of Electrical and Electronics Engineers
  - o. MCAA Mechanical Contractors' Association of American

p.	NEMA	National Electrical Manufacturers Association
q.	NFPA	National Fire Protection Association
r.	NSC	National Safety Council
s.	NSF	National Sanitation Foundation
t.	SBI	Steel Boiler Institute Industry
u.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association
v.	UL	Underwriters Laboratories
w.	ASTM	American Society for Testing and Materials
x.	NEBB	National Environmental Balancing Bureau

#### 1.4 FEES AND PERMITS

- A. Contractor shall apply and pay for all permits, inspections, reviews, etc. required by the authorities having jurisdiction.

#### 1.5 DEFINITIONS

- A. Furnish: The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation and similar operations.
- B. Install: The term install describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- C. Provide: The term provides means to furnish and install, complete and ready for intended use.

#### 1.6 SHOP DRAWINGS AND SUBMITTALS

- A. See Division 01 Section Quality Control for requirements for Shop Drawings and product data.
- B. Asbestos-Free Material/Product: Prior to approval of the material/product to be used, the manufacturer/supplier shall furnish with their submittals written certification that the material/product contains no asbestos. This certificate is mandatory before approval will be issued. Submittals furnished without the asbestos-free certification will be returned to the Contractor with no action taken until such certification is provided.
- C. See applicable Sections to this Division for items requiring Shop Drawings.

#### 1.7 MATERIALS AND WORKMANSHIP

- A. Materials, the style, make or quality of which is specifically designated, shall be as specified.
- B. Contractor shall furnish necessary materials in ample quantities and as frequently as required to avoid delay in the progress of the Work, and shall so store them as to prevent interference with other work.

#### 1.8 DEFECTIVE WORK AND MATERIAL

- A. All materials or work found to be defective or not in strict conformity with the drawings or different from requirements of the drawings and specifications or defaced or injured through negligence of

Contractor or his employees, or through action of fire or weather will be rejected and shall be immediately removed from premises by Contractor and satisfactory materials and work substituted without delay.

- B. All defective work or imperfect work shall be corrected immediately on notice from Government Authorized Technical Representative. No previous inspection or certificate on account shall be held to relieve Contractor from their obligation to furnish sound materials and to perform good and satisfactory work.

#### 1.9 COOPERATION AND COORDINATION

- A. Contractor shall confer with other contractors at the site before installing their work to avoid interferences so that maximum head room and clearances may be maintained. In the event that interferences develop between work of various trades the general contractor shall coordinate the work to eliminate the interference. No additional compensation will be allowed for changes required.
- B. Particular attention shall be paid to situations where recessed equipment, pipes and lights occur, or where the work of several trades occurs together above suspended ceilings, in pipe shafts or in areas where space is limited.
- C. All fixtures, equipment, devices, switches, outlets, pumps, etc., shall be positioned to avoid all interferences with and to assure proper coordination with work of all other trades, cases, partitions, wall, floor and ceiling patterns, architectural features, etc. All recessed devices, fixtures, etc., shall be coordinated with all wall, floor and ceiling patterns.
- D. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for mechanical installations.
- E. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- F. Coordinate requirements for access panels and doors for mechanical items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section Access Doors and Frames.

#### 1.10 PROTECTION OF EQUIPMENT AND SYSTEMS

- A. Contractor shall keep all their respective pipe openings closed by means of plugs or caps to prevent entrance of foreign matter during construction and cover all fixtures, equipment, and apparatus as required to protect them against dirt, water, chemical or mechanical damage both before and after installation. Any such fixtures, equipment or apparatus damaged prior to final acceptance of the Work shall be restored to its original condition or replaced by Contractor at no cost to Government.

#### 1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to project properly identified with 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 mechanical 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.

#### 1.12 CONTRACT DRAWINGS

- A. The layout shown on the Contract Drawings is necessarily diagrammatic but shall be followed as closely as actual construction and as other work will allow. The dimensions of work as shown on the Contract Drawings are not as-built dimensions. No measurements shall be scaled from the drawings and used as definite dimensions for laying out or fitting work in place.
- B. The layout of manufactured equipment as shown on the drawings shall be checked and the exact location shall be determined from the dimensions of equipment shop drawings approved by the Government Authorized Technical Representative.

#### 1.13 MAINTENANCE MANUAL AND OPERATING INSTRUCTIONS

- A. Upon completion of the Work, Contractors shall provide the Government Authorized Technical Representative with three copies of maintenance manual for all equipment furnished and installed under their Work. Manuals shall be in substantial 3-ring binders with project name and number inscribed on face and hinged back. Manual shall include roster of all Government training session attendees. The manual shall, however, first be approved by the Government Authorized Technical Representative.
- B. The manual shall include manufacturer's lubricating and operating instructions and parts list and serial numbers for all operating machinery, including drive information, and motor horsepower, amperage, and voltage readings on all phases, valve chart, sequence of operation, index following the order listed in the specifications, warranties in the name of the Installation, and a list of manufacturers, service firms and subcontractors names and telephone numbers.
- C. Training attendance rosters for each training session shall be included in manuals. Roster will identify training subject, date, attendees name, job title, office symbol, grade/rank, and telephone number.
- D. All switches, controls, and safety devices shall be clearly and permanently marked with embossed or printed plates as to purpose and operation and shall be tested in the presence of the Government Authorized Technical Representative to ensure that he understands their function and purpose.
- E. Upon completion of the Work, Contractors shall put the systems into service. Contractors shall be entirely responsible for the equipment during all testing operations including the lubricating and turning on and off of such apparatus.

#### 1.14 PROJECT RECORD AND CLOSEOUT DOCUMENTS

- A. Refer to the Division 01 Section Closeout Procedures for requirements. The following paragraphs supplement the requirements of Division 01.
- B. Mark Drawings to indicate revisions to piping and ductwork, size and location both exterior and interior; including locations of coils, dampers and other control devices, filters, boxes, and similar units requiring periodic maintenance or repair; actual equipment locations, dimensioned for column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned to

column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices.

- C. Mark Specifications to indicate addenda, approved substitutions, change orders, actual equipment and materials used.

#### 1.15 COMMISSIONING

- A. All Mechanical, Plumbing, Controls (Division 23 Section Instrumentation and Control Devices for HVAC and Division 23 Section Refrigeration Monitoring and Control Systems (RMCS), and TAB Contractors shall comply with the requirements of Division 01 Section General Commissioning Requirements and Division 23 Section Commissioning of HVAC).

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 ACCESSIBILITY

- A. Install equipment and materials to provide required access for servicing and maintenance. Coordinate the final location of concealed equipment and devices requiring access with final location of required access panels and doors. Allow ample space for removal of all parts that require replacement or servicing.
- B. Extend all grease fittings to an accessible location.
- C. Refer to the Division 08 Section Access Doors and Frames.

#### 3.2 MECHANICAL DEMOLITION

- A. Refer to Division 01 Section Cutting and Patching for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
  - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
  - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
  - 3. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
  - 4. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
  - 5. Equipment to Be Removed: Disconnect and cap services and remove equipment.
  - 6. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

7. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Government.
- C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

### 3.3 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment Specifications in Divisions 02 through 33 for rough-in requirements.

### 3.4 HVAC INSTALLATIONS

- A. General: sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
  1. Coordinate mechanical equipment and materials installation with other building components.
  2. Verify all dimensions by field measurements.
  3. Arrange for chases, slots, and openings in other building components to allow for mechanical installation.
  4. 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.
  5. Sequence, coordinate and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
  6. Coordinate the cutting and patching of building components to accommodate the installation of mechanical equipment and materials.
  7. Where mounting heights are not detailed or dimensioned, install mechanical services and overhead equipment to provide maximum headroom possible.
  8. Install mechanical equipment 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.
  9. Coordinate the installation of mechanical materials and equipment above ceiling with suspension system, light fixtures, and other installations.
  10. Install access panel or doors where units are concealed behind finished surface. Access panels and doors are specified in Division 08 Section Access Doors and Frames.
  11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
  12. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
  13. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect/Engineer.
  14. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed expose in finished spaces.

### 3.5 CUTTING AND PATCHING

- A. This Article specifies the cutting and patching of mechanical equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.
- B. Refer to Division 01 Section Quality Control for general requirements for cutting and patching.
- C. Refer to Division 26 for requirements for cutting and patching electrical equipment, components, and materials.
- D. Do not endanger or damage installed Work through procedures and processes of cutting and patching.
- E. Arrange for repairs required to restore other work, because of damage caused as a result of mechanical installations.
- F. No additional compensation will be authorized for cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.
- G. Perform cuttings, fittings, and patching of mechanical equipment and materials required to:
  - 1. Uncover Work to provide for installation of ill-timed work.
  - 2. Remove and replace defective work.
  - 3. Remove and replace Work not conforming to requirements of the Contract Documents.
  - 4. Remove samples of installed Work as specified for testing.
  - 5. Upon written instruction from the Government Authorized Technical Representative, uncover and restore Work to provide for Government Authorized Technical Representative's observation of concealed work.
- H. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

### 3.6 CLEANING

- A. Refer to the Division 01 Section Closeout Procedures for general requirements for final cleaning.
- B. Refer to Division 23 Section Testing, Adjusting, and Balancing for HVAC for requirements for cleaning filters, strainers, and mechanical systems prior to final acceptance.

### 3.7 COMMISSIONING

- A. Accomplish commissioning in accordance with the provisions of Division 01 Section General Commissioning Requirements and Division 23 Section Commissioning of HVAC.

## END OF SECTION



**SECTION 23 05 13****COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Single phase electric motors, field and factory installed.
2. Three phase electric motors, field and factory installed.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable.**

1. Division 01 Section Quality Control.
2. AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
3. AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
4. IEEE 112 - Test Procedure for Polyphase Induction Motors and Generators.
5. NEMA MG 1 - Motors and Generators.
6. NFPA 70 - National Electrical Code.

**1.3 SUBMITTALS****A. Product Data for Field-Installed Motors:** For each type and size of motor, provide nameplate data and ratings; shipping, installed, and operating weights; mounting arrangements; size, type, and location of winding terminations; conduit entry and ground lug locations; and information on coatings or finishes.**B. Shop Drawings for Field-Installed Motors:** Dimensioned Plans, Elevations, Sections, and Details, including required clearances and service space around equipment. Include the following:

1. Each installed unit's type and details.
2. Nameplate legends.
3. Diagrams of power and control wiring. Provide schematic wiring diagram for each type of motor and for each control scheme.

**C. Field quality-control test reports.**

- D. Operation and Maintenance Data: For field-installed motors to be included in operation and maintenance manuals.

#### 1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacture of electric motors for the intended use, and their accessories, with minimum three years documented product development, testing, and manufacturing experience.

#### 1.5 REGULATORY REQUIREMENTS

- A. Conform to all applicable electrical and energy codes, NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc. as suitable for the purpose specified and indicated.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 Section Environmental Management.
- B. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

### PART 2 - PRODUCTS

#### 2.1 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Motors Less Than 250 Watts, for Intermittent Service: Equipment manufacturer's standard and need not conform to these Specifications.
- B. Refer to Schedules on Contract Drawings for required electrical characteristics.
- C. Type:
  - 1. Open drip-proof except where specifically noted otherwise.
  - 2. Motors: Design for continuous operation in 104 deg F environment.
  - 3. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
  - 4. Motors with frame sizes 143T and larger: Energy Efficient Type.
- D. Explosion-Proof Motors: UL approved and labeled for hazard classification, with over temperature protection.
- E. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- F. Wiring Terminations:

1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
  2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.
- G. Motors shall be quiet running, free of vibration and magnetic hum.
- H. All motors shall be designed for the operating conditions and service requirements of the intended service.
- I. All motors shall be designated "NEMA Premium Motors".

## 2.2 SINGLE PHASE POWER - SPLIT PHASE MOTORS

- A. Starting Torque: Less than 150 percent of full load torque.
- B. Starting Current: Up to seven times full load current.
- C. Breakdown Torque: Approximately 200 percent of full load torque.
- D. Drip-proof Enclosure: Class A (122 deg F temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
- E. Enclosed Motors: Class A (122 deg F temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

## 2.3 SINGLE PHASE POWER - PERMANENT-SPLIT CAPACITOR MOTORS

- A. Starting Torque: Exceeding one fourth of full load torque.
- B. Starting Current: Up to six times full load current.
- C. Multiple Speed: Through tapped windings.
- D. Open Drip-proof or Enclosed Air Over Enclosure: Class A (122 deg F temperature rise) insulation, minimum 1.0 Service Factor, prelubricated sleeve or ball bearings, automatic reset overload protector.

## 2.4 SINGLE PHASE POWER - CAPACITOR START MOTORS

- A. Starting Torque: Three times full load torque.
- B. Starting Current: Less than five times full load current.
- C. Pull-up Torque: Up to 350 percent of full load torque.
- D. Breakdown Torque: Approximately 250 percent of full load torque.
- E. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.

- F. Drip-proof Enclosure: Class A (122 deg F temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
- G. Enclosed Motors: Class A (122 deg F temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

## 2.5 ELECTRONIC COMMUTATED (EC) MOTORS

- A. EC motor shall be specifically designed for fan applications.
- B. AC induction type motors are not acceptable where an EC motor has been specified or scheduled. Examples of unacceptable motors are: Shaded Pole, Permanent Split Capacitor (PSC), Split Phase, Capacitor Start and 3 phase induction type motors.
- C. Motors shall be permanently lubricated with heavy-duty ball bearings to match the fan load and prewired to the specific voltage and phase.
- D. Internal motor circuitry shall convert AC power supplied to the fan to DC power to operate the motor.
- E. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by either a potentiometer dial mounted on the motor or by a 0-10 VDC signal as specified or scheduled.
- F. Motor shall be minimum of 85% efficient at all speeds.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Single Phase Motors for Shaft Mounted Fans or Centrifugal Pumps: Split phase type.
- B. Single Phase Motors for Shaft Mounted Fans or Blowers: Permanent split capacitor type.
- C. Single Phase Motors for Fans, Pumps, Blowers, Air Compressors: Capacitor start type.
- D. Single Phase Motors for Fans, Blowers, Pumps: Capacitor start, capacitor run type.
- E. Motors Located in Exterior Locations, Wet Air Streams Downstream Draw Thru Cooling Coils, Air Cooled Condensers: Totally enclosed type.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

## 3.3 NEMA OPEN MOTOR SERVICE FACTOR SCHEDULE

HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
1/6-1/3	1.35	1.35	1.35	1.35
1/2	1.25	1.25	1.25	1.15
3/4	1.25	1.25	1.15	1.15
1	1.25	1.15	1.15	1.15
1.5-150	1.15	1.15	1.15	1.15

**END OF SECTION**

**SECTION 23 05 29****HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Pipe and equipment hangers and supports.
2. Equipment bases and supports.
3. Sleeves and seals.
4. Flashing and sealing equipment and pipe stacks.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 05 Section Metal Fabrications.
5. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications for a part of this Specification to the extent they are applicable.**

1. Division 01 Section Quality Control.
2. ASME B31.1 - Power Piping.
3. ASME B31.2 - Fuel Gas Piping.
4. ASME B31.5 - Refrigeration Piping.
5. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
6. MSS SP58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
7. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
8. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
9. UL 203 - Pipe Hanger Equipment for Fire Protection Service.

**1.3 REGULATORY REQUIREMENTS**

- A.** Conform to applicable code for support of plumbing piping.
- B.** Supports for Sprinkler Piping: In conformance with NFPA 13.
- C.** Supports for Standpipes: In conformance with NFPA 14.

**PART 2 - PRODUCTS****2.1 ACCESSORIES**

- A. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
- B. Beam clamps shall not be of the set screw type unless they also have a positive means of securing the clamp against horizontal movement, i.e. horizontal j-bolt extending to the opposite flange of the beam or joist or similar device.
- C. Hanger loads of up to 300 pounds can be applied to the top or bottom chord of a bar joist using a threaded rod between the chord angles with washer and double nuts above and below the chord within 6 inches of a panel point. Heavier loads require coordination with the joist manufacturer.

**2.2 PIPE HANGERS AND SUPPORTS**

- A. Hydronic Piping - Above and below ambient air temperature.
  - 1. Conform to MSS SP58, MSS SP69, MSS SP89.
  - 2. Hangers for all Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for below ambient air temperature Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
  - 4. Hangers for above ambient air temperature Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
  - 5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 6. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
  - 7. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.
  - 8. Wall Support for Hot Pipe Sizes 6 Inches and Over: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
  - 9. Vertical Support: Steel riser clamp.
  - 10. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 11. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 12. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

**2.3 INSERTS**

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.
- B. Self drilling expansion anchors, powder driven anchors, or other similar devices shall be applied in accord with their manufacturers published ratings and instructions.

## 2.4 FLASHING

- A. Metal Flashing: 26 gage galvanized steel.
- B. Metal Counterflashing: 22 gage galvanized steel.

## 2.5 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gauge galvanized steel.
- C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, AWL listed.
- D. Sleeves for pipes or ducts through foundation walls below grade: Steel pipe or schedule 40 PVC pipe.
- E. Sleeves for Round Ductwork: Galvanized steel.
- F. Sleeves for Rectangular Ductwork: Galvanized steel.
- G. Firestopping Insulation: Glass fiber type, non-combustible.
- H. Sealant: Acrylic.

## 2.6 FLOOR SUPPORTS

- A. Concrete housekeeping pads shall comply with Division 03. Concrete pads shall extend 6 inches beyond equipment and be 4 inches high indoors, 6 inches high out of doors on grade.

## 2.7 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

## 2.8 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry hydraulic-cement, nonshrink and non metallic grout; suitable for interior and exterior applications.
  - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compression strength.



**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
  - 1. Support of all equipment, piping, etc. such that it will withstand a force of 0.5 times its weight in any direction and 1.5 times its weight downward.
  - 2. Do not attach to roof deck, connect to structural members and span between same with structural members, Unistrut, etc.
  - 3. Roof mounted equipment curbs and roof mounting rails shall be installed to withstand the wind and seismic loading required by Division 01 Section Summary of Work.

**3.2 INSERTS**

- A. Provide inserts for placement in concrete formwork.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

**3.3 PIPE HANGERS AND SUPPORTS**

- A. Support horizontal piping as scheduled.
- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place hangers within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers unless seismic zone dictates individual clevis hangers. Verify seismic zone with Division 23 Section Vibration and Seismic Controls for HVAC Piping and Equipment.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide **[copper plated hangers and supports for copper piping] [sheet lead packing between hanger or support and piping]**.

- J. Design hangers for pipe movement without disengagement of supported pipe.

### 3.4 EQUIPMENT BASES AND SUPPORTS

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Refer to Division 03 Section Cast-in-Place Concrete.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct supports of steel members. Brace and fasten with flanges or plates bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

### 3.5 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for mechanical roof installations 14 inches minimum high above roofing surface. Flash and counterflash with sheet metal; seal watertight. Attach counterflashing and mechanical equipment, and lap base flashing on roof curbs. Flatten and solder joints.
- C. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

### 3.6 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves.
- D. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing (fire stopping at fire walls) insulation and caulk air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- E. Install chrome plated steel escutcheons at finished surfaces.

### 3.7 HANGER SPACING

HANGER ROD PIPE SIZE Inches	MAX. HANGER SPACING Feet	DIAMETER Inches
1/2 to 1-1/4	6.5	3/8
1-1/2 to 2	10	3/8
2-1/2 to 3	10	1/2
4 to 6	10	5/8
8 to 12	14	7/8

14 and Over  
PVC (All Sizes)20  
61  
3/8**END OF SECTION**

**SECTION 23 05 93****TESTING, ADJUSTING, AND BALANCING FOR HVAC**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Testing, adjustment, and balancing of all air and water systems.

**B. Related Work:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. AABC - National Standards for Total System Balance.
3. ADC - Test Code for Grilles, Registers, and Diffusers.
4. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
5. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems, Eighth Edition-2015.
6. SMACNA – TABB-HVAC Systems Testing, Adjusting, and Balancing.

**B. Procedures:**

1. Perform system balance in accordance with AABC National Standards for Field Measurement and Instrumentation or in compliance with NEBB Procedural Standards for Testing Adjusting Balancing (2015)
2. Maintain one copy of document on site.
3. Provide certification of calibration of instruments indicating calibration not less than 6 months prior to date of use.

**1.3 QUALIFICATIONS**

- A. Agency: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with a minimum three years of documented experience and certified by either AABC or NEBB.

- B. Perform Work under supervision of AABC Certified Test and Balance Engineer or NEBB Certified Testing, Adjusting and Balancing Certified Professional.
- C. Testing, Adjusting, Balancing (TAB) firm shall be totally independent of any contractor or equipment provider on the project.
- D. Testing, Adjusting, Balancing firm will be employed directly by the General Contractor and will report all findings, issues, deficiencies, etc directly to the General Contractor

#### 1.4 SUBMITTALS

- A. Submit under provisions of Division 01 Section Quality Control.
- B. Qualification Data: Submit, for approval within 30 days after award of the General Contract, the name of adjusting and balancing agency and evidence that TAB firm and this Project's TAB team members meet the qualifications specified.
- C. Within 60 days of General Contract award conduct and review a TAB design review detailing and items that would prevent the successful balancing of the systems.
- D. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- E. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
- F. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Government's Designated Representative and for inclusion in operating and maintenance manuals.
  - 1. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced Drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
  - 2. Test Reports: Indicate data on AABC National Standards for Total System Balance forms containing information indicated in Schedules.
  - 3. Submit technician's field notes with the preliminary report.
- G. Operation and Maintenance data.

#### 1.5 QUALITY ASSURANCE

- A. Perform system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance.
- B. Certification of TAB Reports: Certify TAB field data reports. This certification includes the following:
  - 1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  - 2. Certify that TAB team complied with approved TAB plan and the procedures specified and referenced in this Specification.

- C. TAB Report Forms: Use forms compliant to NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" or from SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing".
- D. Maintain one copy of document on site.
- E. Provide certification of calibration of instruments indicating calibration not less than 6 months prior to date of use.

## 1.6 SEQUENCING

- A. Sequence work to commence after leakage and pressure tests on air and water distribution systems have been satisfactorily completed and before Substantial Completion of Project.

## 1.7 EMPLOYMENT

- A. The General Contractor (GC) shall employ and pay for services of an independent testing and balancing (TAB) agency to perform all work in this Section.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### A. EXAMINATION

- B. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
  - 1. Systems are started and operating in a safe and normal condition.
  - 2. Temperature control systems are installed complete and operable.
  - 3. Proper thermal overload protection is in place for electrical equipment.
  - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
  - 5. Duct systems are clean of debris.
  - 6. Fans are rotating correctly.
  - 7. Fire and volume dampers are in place and open.
  - 8. Air coil fins are cleaned and combed.
  - 9. Access doors are closed and duct end caps are in place.
- C. Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance.
- D. Beginning of work means acceptance of existing conditions.

## 3.2 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Quality Control Representative to facilitate spot checks during testing.
- B. Provide additional balancing devices as required.

### 3.3 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

### 3.4 ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- 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 belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Government.
- F. Check and adjust systems approximately six months after final acceptance and submit report.

### 3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. On dehumidification units, balance the internal bypass damper according to the manufacturer's procedures and recommendations.
- C. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- D. Measure air quantities at air inlets and outlets.
- E. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- F. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- G. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.
- H. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

- I. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- J. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- K. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- L. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- M. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.

### 3.6 SCHEDULES

#### A. Report Forms:

##### 1. Title Page:

- a. Name of Testing, Adjusting, and Balancing Agency.
- b. Address of Testing, Adjusting, and Balancing Agency.
- c. Telephone number of Testing, Adjusting, and Balancing Agency.
- d. Project name.
- e. Project location.
- f. Project Architect.
- g. Project Engineer.
- h. Project Contractor.
- i. Project altitude.
- j. Report date.

##### 2. Summary Comments:

- a. Design versus final performance.
- b. Notable characteristics of system.
- c. Description of systems operation sequence.
- d. Summary of outdoor and exhaust flows to indicate amount of building pressurization.
- e. Nomenclature used throughout report.
- f. Test conditions.

##### 3. Instrument List:

- a. Instrument.
- b. Manufacturer.
- c. Model number.
- d. Serial number.
- e. Range.
- f. Calibration date.

##### 4. Electric Motors:



- a. Manufacturer.
  - b. Model/frame.
  - c. HP/BHP.
  - d. Phase, voltage, amperage; nameplate, actual, no load.
  - e. RPM.
  - f. Service factor.
  - g. Starter size, rating, heater elements.
  - h. Sheave make/size/bore.
5. Air Cooled Condenser:
- a. Identification/number.
  - b. Location.
  - c. Manufacturer.
  - d. Model number.
  - e. Serial number.
  - f. Entering DB air temperature, design and actual.
  - g. Leaving DB air temperature, design and actual.
  - h. Number of compressors.
6. Exhaust Fan Data:
- a. Location.
  - b. Manufacturer.
  - c. Model number.
  - d. Serial number.
  - e. Air flow, specified and actual.
  - f. Total static pressure (total external), specified and actual.
  - g. Inlet pressure.
  - h. Discharge pressure.
  - i. Sheave Make/Size/Bore.
  - j. Number of Belts/Make/Size.
  - k. Fan RPM.

**END OF SECTION**

**SECTION 23 09 13****INSTRUMENTATION AND CONTROL DEVICES FOR HVAC**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Thermostats.
2. Miscellaneous accessories.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 23 Section Ductless Split-System Air Conditioners.
5. Division 23 Section HVAC Power Ventilators.
6. Division 23 Section Metal Ducts and Air Accessories.
7. Division 23 Section Air Cooled Heat Pumps.
8. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. NEMA DC 3 - Low-Voltage Room Thermostats.
3. NFPA 70 - National Electrical Code.
4. NFPA 90A Installation of Air Conditioning and Ventilation Systems.

**1.3 SUBMITTALS****A. Submittals for Review:**

1. Division 01 Section Quality Control: Procedures for submittals.
2. Product Data: Provide description and engineering data for each control system component. Include sizing as requested. Provide data for each system component and software module.

**B. Submittals At Project Closeout:**

1. Division 01 Section Closeout Procedures.
2. Operation and Maintenance Data: Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.

3. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

#### 1.4 QUALIFICATIONS

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum three years experience.

#### 1.5 PREINSTALLATION MEETING

- A. Division 01 Section Administration Requirements.
- B. Convene one week before starting work of this Section.
- C. Attendees shall be Division 23 Section Refrigeration Monitoring and Control Systems (RMCS) Sub-contractor, Division 23 Section Instrumentation and Control Devices for HVAC Sub-contractor, Government's Designated Representative, and General Contractor's Representative.

#### 1.6 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

#### 1.7 MAINTENANCE SERVICE

- A. Division 01 Section Closeout Procedures.
- B. Provide service and maintenance of control system for one year from date of Substantial Completion.
- C. Provide complete service of controls systems, including call backs. Make minimum of 4 complete normal inspections of approximately 42 hours duration in addition to normal service calls to inspect, calibrate, and adjust controls, and submit written reports.

#### 1.8 EXTRA MATERIALS

- A. Division 01 Section Closeout Procedures.
- B. Provide two of each type of thermostat.

### **PART 2 - PRODUCTS**

#### 2.1 THERMOSTATS

- A. Thermostats - Programmable:
  1. Honeywell T8000 or equal.
  2. Non-volatile set point memory.

3. Separate setpoints for Heating-Day, Heating-Night, Cooling-Day and Cooling-Night.
4. Deadband between Heating and Cooling setpoints.
5. Automatic changeover from Heating to Cooling.
6. Choice of constant or cycling fan on Day cycle via concealed switch.
7. Cycling fan control on Night cycle.
8. Relay to close OA MD on Night cycle.
9. Quartz clock.
10. Up to 4 time periods and setpoints.
11. Monday through Friday Program and Saturday Sunday Program.

B. Room Thermostat Accessories: Thermostat Covers:

1. Insulating Bases: For thermostats located on exterior walls.
2. Thermostat Guards: Locking transparent plastic mounted on separate base.
3. Adjusting Key: As required for device.
- 4.

### PART 3 - EXECUTION

#### 3.1 DUCTLESS SPLIT SYSTEMS

- A. Mount and wire the thermostat furnished with the unit. Provide control wiring between indoor and outdoor units.

#### 3.2 EXHAUST

FANS

1. OCCUPANCY (Restrooms-single occupancy)
  - a. Provide wiring, occupancy switch, relays, etc necessary to operate fan with occupancy of the room being exhausted.
  - b. Provide wiring, interlock with wall switch to operate fan within room being exhausted.

**END OF SECTION**

**SECTION 23 23 00****REFRIGERANT PIPING FOR HVAC**

(Edited from DeCA December 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Piping.
2. Refrigerant.
3. Flexible connections.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Environmental Procedures for Refrigerants.
3. Division 01 Section Quality Control.
4. Division 01 Section Closeout Procedures.
5. Division 23 Section Hangers and Supports for HVAC Piping and Equipment.
6. Division 23 Section HVAC Piping Insulation.
7. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ARI 710 - Liquid Line Dryers.
3. ARI 730 - Flow-Capacity Rating and Application of Suction-Line Filters and Filter-Driers
4. ASHRAE 15 - Safety Standard for Refrigeration Systems.
5. ASHRAE 34 - Number Designation and Safety Classifications of Refrigerants.
6. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
7. ASME B16.26 - Cast Copper Alloy Fittings For Flared Copper Tubes.
8. ASME B31.5 - Refrigeration Piping and Heat Transfer Components.
9. ASME B31.9 - Building Services Piping.
10. ASTM B88 - Seamless Copper Water Tube.
11. ASTM B280 - Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
12. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
13. AWS A5.8 - Brazing Filler Metal - Specification for Filler Metals for Brazing and Braze Welding.
14. MSS SP58 - Pipe Hangers and Supports - Materials, Design, Manufacturer, Selection, Application and Installation.
15. MSS SP69 - Pipe Hangers and Supports - Selection and Application.
16. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

### 1.3 SUBMITTALS

#### A. Submittals for Review:

1. Submit under provisions of Division 01 Section Quality Control.

#### B. Indicate schematic layout of system, including equipment, critical dimensions, and sizes developed by the Condensing Unit Manufacture Submittals At Project Closeout:

1. Division 01 Section Closeout Procedures.
2. Project Record Documents: Record actual locations of components.
3. Operation and Maintenance Data: Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
4. Warranty: Submit compressor manufacturer warranty and ensure forms have been completed in Government's name and registered with manufacturer.
5. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store piping and specialties in shipping containers with labeling in place.
- B. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.
- C. Dehydrate and charge components such as piping and receivers, seal prior to shipment, until connected into system.

### 1.5 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this Section with minimum three years documented experience.
- B. Design piping system under direct supervision of a Professional Engineer experienced in design of this work, licensed in one of the states of the United States of America, and employed or approved by the manufacturer of the equipment.

### 1.6 REGULATORY REQUIREMENTS

- A. Conform to IMC ASME B31.9 for installation of piping system.
- B. Products Requiring Electrical Connection: Listed and classified by UL, as suitable for the purpose indicated.

## PART 2 - PRODUCTS

### 2.1 PIPING

- A. Copper Tubing: ASTM B280, Type ACR hard drawn.

1. Fittings: ASME B16.22 wrought copper.
  2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 deg F.
- B. Copper Tubing to 7/8 inch OD: ASTM B88, Type K, annealed.
1. Fittings: ASME B16.26 cast copper.
  2. Joints: Flared.
- C. Pipe Supports and Anchors:
1. See Division 23 Section Hangers and Supports for HVAC Piping and Equipment.
- 2.2 REFRIGERANT
- A. Refrigerant: ASHRAE 34:
1. R-410A.
- 2.3 FLEXIBLE CONNECTORS
- A. 500 psig minimum operating pressure; seamless tin-bronze core, high-tensile bronze-braid covering, and solder-joint end connections: dehydrated, pressure tested, minimum 7 inches long.
- 2.4 DRAIN PIPING
- A. Type DWV copper with wrought, copper fittings.

### **PART 3 - EXECUTION**

#### **3.1 SYSTEM DESCRIPTION**

- A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing is consistently provided.
- B. Provide pipe hangers and supports in accordance with MSS SP69 unless indicated otherwise.
- C. Solenoid Valves:
1. Use in liquid line of systems operating with single pump-out or pump-down compressor control.
  2. Use in liquid line of single or multiple evaporator systems.
  3. Use in oil bleeder lines from flooded evaporators to stop flow of oil and refrigerant into the suction line when system shuts down.
- D. Flexible Connectors: Utilize at or near condensing units or coils in resiliently mounted equipment where piping configuration does not absorb vibration.

### 3.2 FIELD QUALITY CONTROL

- A. Pressure test system with dry nitrogen to 200 psig. Perform final tests at 27 inches vacuum and 200 psig using electronic leak detector. Test to no leakage.

### 3.3 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### 3.4 INSTALLATION

- A. Install refrigerant piping according to ASHRAE 15.
- B. Basic piping installation requirements are specified in Division 23 Section Common Work Results for HVAC.
- C. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- D. Arrange piping to allow inspection and service of compressor and other equipment. Install valves and specialties in accessible locations to allow for service and inspection.
- E. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation. Use sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation. Seal all penetrations air tight with foam insulation.
- F. Below ground, install copper tubing in protective PVC Pipe. Install copper tubing in rigid or flexible conduit in locations where copper tubing will be exposed to mechanical injury.
- G. Slope refrigerant piping as follows:
  - 1. Install horizontal hot-gas discharge piping with a uniform slope of 1 inch for every 20 feet downward away from compressor.
  - 2. Install horizontal suction lines with a uniform slope of 1 inch for every 20 feet downward to compressor.
  - 3. Install traps and double risers where required to entrain oil in vertical runs.
  - 4. Liquid lines may be installed level.
- H. Install bypass around moisture-liquid indicators in lines larger than NPS 2 inch.
- I. Install unions to allow removal of solenoid valves, pressure-regulating valves, and expansion valves and at connections to compressors and evaporators.
- J. When brazing, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion valve bulb.
- K. Hanger, support, and anchor products are specified in Division 23 Section Hangers and Supports for HVAC Piping and Equipment.



L. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:

1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4-inch.
2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4-inch.
3. NPS 1: Maximum span, 72 inches; minimum rod size, 1/4-inch.
4. NPS 1-1/4: Maximum span, 96 inches; minimum rod size, 3/8-inch.
5. NPS 1-1/2: Maximum span, 96 inches; minimum rod size, 3/8-inch.
6. NPS 2: Maximum span, 96 inches; minimum rod size, 3/8-inch.
7. NPS 2-1/2: Maximum span, 108 inches; minimum rod size, 3/8-inch.
8. NPS 3: Maximum span, 10 feet; minimum rod size, 3/8-inch.
9. NPS 4: Maximum span, 12 feet; minimum rod size, 1/2-inch.

M. Support vertical runs at each floor.

### 3.5 PIPE JOINT CONSTRUCTION

A. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide) during brazing to prevent scale formation.

### 3.6 FIELD QUALITY CONTROL

A. Test and inspect refrigerant piping according to ASME B31.5, Chapter VI.

1. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure.
2. Test high- and low-pressure side piping of each system with dry nitrogen to 200 psig. Perform final tests at 27 inches vacuum and 200 psig using electronic leak detector. Test to no leakage.

**END OF SECTION**

**SECTION 23 31 13****METAL DUCTS AND AIR ACCESSORIES**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Metal ductwork.
2. Duct test holes.
3. Volume control dampers.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 23 Section Hangers and Supports for HVAC Piping and Equipment.
5. Division 23 Section Duct Insulation.
6. Division 23 Section Diffusers, Registers, and Grilles.
7. Division 23 Section Testing, Adjusting and Balancing for HVAC.
8. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ASTM A 36 - Structural Steel.
3. ASTM A 90 - Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
4. ASTM A 366 - Steel, Sheet, Carbon, Cold Rolled, Commercial Quality.
5. ASTM A 525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
6. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality.
7. ASTM A 568 - Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
8. ASTM A 569 - Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
9. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
10. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
11. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.
12. NFPA 96 - Ventilation of Commercial Kitchens.
13. SMACNA - HVAC Air Duct Leakage Test Manual.
14. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
15. UL 555 - Fire Dampers and Ceiling Dampers.

## 16. UL 33 - Heat Responsive Links for Fire Protection Services.

## 1.3 PERFORMANCE REQUIREMENTS

- A. No variation of duct configuration or sizes permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

## 1.4 SUBMITTALS

- A. Submittals During Construction:
  - 1. Submit under provisions of Division 01 Section Quality Control.
  - 2. Test Reports: Indicate pressure tests performed. Include date; section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.
  - 3. Operation and Maintenance data.
- B. Submittals at Project Closeout:
  - 1. Division 01 Section Closeout Procedures.
  - 2. Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.
  - 3. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

## 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

## 1.6 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A and NFPA 90B standards.

## 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealants.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect dampers from damage to operating linkages and blades.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of in conformance with ASTM A90.
- B. Insulated Flexible Ducts:
  - 1. Two ply vinyl film supported by helically wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film.
  - 2. Pressure Rating: 4 inches WG positive and 1.0 inches WG negative.
  - 3. Maximum Velocity: 4000 fpm.
  - 4. Temperature Range: Minus 10 deg F to 160 deg F.
- C. Sealant:
  - 1. Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.
  - 2. Low Volatile Organic Content (VOC).
- D. Hanger Rod: ASTM A36; steel; threaded both ends, threaded one end, or continuously threaded.

**2.2 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.
- 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 air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- C. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- D. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

**2.3 MANUAL VOLUME DAMPERS**

- A. Standard, Steel, Manual Volume Dampers:
  - 1. Standard leakage rating, with linkage outside airstream.
  - 2. Suitable for horizontal or vertical applications.
  - 3. Frames:
    - a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.
    - b. Mitered and welded corners.
    - c. Flanges for attaching to walls and flangeless frames for installing in ducts.

4. Blades:
    - a. Multiple or single blade.
    - b. Parallel- or opposed-blade design.
    - c. Stiffen damper blades for stability.
    - d. Galvanized-steel, 0.064 inch thick.
  5. Blade Axles: Galvanized steel.
  6. Bearings:
    - a. Oil-impregnated bronze.
    - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
  7. Tie Bars and Brackets: Galvanized steel.
- B. Round Standard, Steel, Manual Volume Damper:
1. Blades: Stiffen damper blades for stability. Provide galvanized-steel, 24-gauge (0.024 thick.).
  2. Blade axles to be galvanized-steel.

## EXECUTION

### 2.4 INSTALLATION

- A. Install in accordance with manufacturer's instructions, and NFPA 90A.
- B. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- C. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- D. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- F. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
- G. Use double nuts and lock washers on threaded rod supports.
- H. Connect diffusers to low pressure ducts directly or with 10 feet maximum length of insulated flexible duct held in place with strap or clamp.
- I. Connect flexible ducts to metal ducts with draw bands and sheet metal screws.
- J. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

- K. Do not attach hangers to roof deck.
- L. Kitchen exhaust ducts shall have access doors accessible from a 10' or shorter step ladder in accord with NFPA 96-(most current version).
- M. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- N. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Review locations prior to fabrication.
- O. Provide duct test holes where indicated and required for testing and balancing purposes.
- P. Provide fire dampers and smoke dampers at locations indicated. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- Q. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
- R. Demonstrate re-setting of fire dampers to Government's representative.
- S. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment, and supported by vibration isolators.
- T. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- U. Use splitter dampers only where indicated.
- V. Provide balancing dampers on high velocity systems where indicated. Refer to Division 23 Section Convection Heating and Cooling Units.
- W. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

## 2.5 TESTING

- A. Test in accordance with procedure outlined in SMACNA HVAC Air Duct Leakage Test Manual. Testing shall be required for all pressure classes unless waived by the Contracting officer.

## 2.6 CLEANING

- A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with temporary filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

## 2.7 SCHEDULES

- A. DUCTWORK MATERIAL SCHEDULE

AIR SYSTEM	MATERIAL
Low Pressure Supply	Steel
Return and Relief	Steel
General Exhaust	Steel
Outside Air Intake	Steel
Combustion Air	Steel

**B. DUCTWORK PRESSURE CLASS SCHEDULE**

AIR SYSTEM	PRESSURE CLASS
Supply (System with Cooling Coils)	2 inch
Return and Relief	1 inch
General Exhaust	1 inch
Outside Air Intake	1 inch
Combustion Air	1/2 inch

**END OF SECTION**

**SECTION 23 34 23****HVAC POWER VENTILATORS**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Inline fan

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 23 Section Hangers and Supports for HVAC Piping and Equipment.
5. Division 23 Section Common Motor Requirements for HVAC Equipment.
6. Division 23 Section Metal Ducts and Air Accessories.
7. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this Specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. AMCA 99 - Standards Handbook.
3. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
4. AMCA 261 - Directory of Products Licensed to Bear the AMCA Certified Ratings Seal.
5. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
6. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
7. NEMA MG1 - Motors and Generators.
8. NFPA 70 - National Electrical Code.
9. UL 705 - Power Ventilators.

**1.3 SUBMITTALS****A. Submittals for Review:**

1. Submit under provisions of Division 01 Section Quality Control.
2. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:
  - a. Certified fan performance curves with system operating conditions indicated.
  - b. Certified fan sound-power ratings.
  - c. Motor ratings and electrical characteristics, plus motor and electrical accessories.
  - d. Material thickness and finishes, including color charts.



- e. Dampers, including housings, linkages, and operators.
    - f. Roof curbs.
    - g. Fan speed controllers.
  - 3. Manufacturer's Installation Instructions.
- B. Submittals at Project Closeout:
- 1. Division 01 Section Closeout Procedures.
  - 2. Operation and Maintenance Data: Include manufacturers' descriptive literature, instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.
  - 3. The Contractor shall submit all certifications and testing data as a supplement to previously submitted O & M manuals at contract closeout.

## PART 2 - PRODUCTS

### 2.1 INLINE FANS

- A. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing , resilient mounted motor, gravity backdraft damper in discharge.
- B. Disconnect Switch: In housing for thermal overload protected motor.
- C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install power ventilators level and plumb.
- C. Secure roof-mounting fans to roof curbs with cadmium-plated hardware. Refer to Division 07 Section ROOF ACCESSORIES for installation of roof curbs.
- D. Ceiling Units: Suspend units from structure; use steel wire or metal straps.
- E. Support suspended units from structure using threaded steel rods and **spring hangers** having a static deflection of 1 inch. Vibration-control devices are specified in Division 23 Section VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT.
- F. Install units with clearances for service and maintenance.
- G. Provide sheaves required for final air balance.
- H. Install dampers on inlet to roof exhausters.

- I. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.
- J. Range hood exhaust fans shall discharge 40 inches or more above roof and 3 feet above intakes within 10 feet horizontally.
- K. Label units according to requirements specified in Division 23 SECTION IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT.
- L. Install HVLS fans in accordance with manufacturer's recommendations. Install cable restraints to arrest the motor and hub.

### 3.2 CONNECTIONS

- A. Duct installation and connection requirements are specified in other related Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section METAL DUCTS AND AIR ACCESSORIES.
- B. Install ducts adjacent to power ventilators to allow service and maintenance.
- C. Ground equipment according to Division 26 Section Grounding and Bonding for Electrical Systems.

### 3.3 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. Verify that shipping, blocking, and bracing are removed.
  - 2. Verify that unit is secure on mountings and supporting devices and that connection to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

### 3.4 CONTROL

- A. NON-RMCS controlled units: Provide controls as indicated on drawings and Division 23 Section "INSTRUMENTATION AND CONTROL DEVICES FOR HVAC".

**END OF SECTION**

**SECTION 23 81 26****DUCTLESS SPLIT SYSTEM AIR CONDITIONERS**

(Edited from DeCA June 2019 Design Criteria)

**PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Outdoor unit package.
2. Charge of refrigerant and oil.
3. Controls and control connections.
4. Ductless indoor unit.
5. Precharged refrigerant piping.

**B. Related Sections:**

1. Division 01 Section Mechanical, Refrigeration, Food Service Equipment and Electrical Coordination.
2. Division 01 Section Quality Control.
3. Division 01 Section Closeout Procedures.
4. Division 23 Section Hangers and Supports for HVAC Piping and Equipment
5. Division 23 Section Vibration and Seismic Controls for HVAC Piping and Equipment.
6. Division 23 Section Air Coils.
7. Division 23 Section Instrumentation and Control Devices for HVAC.
8. Division 26 Electrical.

**1.2 QUALITY CONTROL****A. The following publications form a part of this specification to the extent they are applicable:**

1. Division 01 Section Quality Control.
2. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
3. ASHRAE 14 - Methods of Testing for Rating Positive Displacement Condensing Units.
4. ASHRAE 15 - Safety Code for Mechanical Refrigeration.
5. ASHRAE 62.1-2004, Section 4 - Outdoor Air Quality, Section 5 - Systems and Equipment, Section 6 - Procedures, and Section 7 - Construction and System Start-Up.
6. ASHRAE 90A - Energy Conservation in Building Design.
7. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
8. UL 207 - Refrigerant-Containing Components and Accessories, Non-Electrical.

**1.3 SUBMITTALS****A. Submittals for Review:**

1. Division 01 Section Quality Control: Procedures for submittals.

2. Shop Drawings: Indicate components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Include schematic layouts showing condensing units, cooling coils, refrigerant piping, and accessories required for complete system.
3. Product Data: Provide rated capacities, weights specialties and accessories, electrical nameplate data, and wiring diagrams.
4. Operation and Maintenance data.

#### 1.4 DELIVERY, STORAGE, AND PROTECTION

- A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.
- B. Protect units on site from physical damage. Protect coils.

#### 1.5 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Units shall be manufactured in the USA.
- B. Basis of design product: EMI America series.

#### 2.2 REFRIGERANT

- A. R410A.

#### 2.3 CONDENSING UNITS

- A. Units: Self-contained, packaged, factory assembled and pre-wired **[cooling]** **[heat pump]** units suitable for outdoor use consisting of cabinet, compressors, outdoor coil and fans, integral sub-cooling coil, controls, liquid receiver, and screen guards with separate indoor ductless fan and coil.
- B. Construction and Ratings: In accordance with ARI 210/240 and UL 207 and UL 303. Testing shall be in accordance with ASHRAE 14.
- C. Performance Ratings: Energy Efficiency Rating (EER) and Coefficient of Performance (COP) not less than prescribed by ASHRAE 90A.
- D. Casing:
  1. House components in welded steel frame with galvanized steel panels with weather resistant, baked enamel finish.
  2. Mount starters, and controls in weatherproof panel provided with full opening access doors.
  3. Provide removable access doors or panels with quick fasteners.

## E. Condenser Coils:

1. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Provide sub-cooling circuits. Air test under water to 425 psig, and vacuum dehydrate. Seal with holding charge of refrigerant.
2. Coil Guard: Expanded metal, Louvered, or PVC coat steel wire.

## F. Fans and Motors:

1. Direct driven propeller type condenser fans with fan guard on discharge.
2. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor with built in thermal overload protection.

## G. Compressors:

1. Compressor: Hermetic reciprocating or rotary type (interior).
2. Mounting: Statically and dynamically balance rotating parts and mount on vibration isolators.
3. Motor: Constant speed 3600 rpm suction gas cooled with winding over temperature protection.
4. Crankcase Heater: Evaporates refrigerant returning to crankcase during shut down. Energize heater when compressor is not operating.

## 2.4 INDOOR DUCTLESS FANCOIL UNIT

A. **Four way discharge, ceiling recessed fan coil unit with condensate pump, and combination return air grille and adjustable supply air diffuser.**

- ~~B.~~ The condensate pump shall have a minimum shut-off head of 15 feet or a separate condensate pump with reservoir, float switch and check valve shall be furnished.

## 2.5 REFRIGERANT CIRCUIT

- A. Provide each unit with one refrigerant circuit, factory supplied and piped.
- B. For each refrigerant circuit, provide:

1. Filter dryer.
2. Thermal expansion device.
3. Insulated suction line.
4. Suction and liquid line service valves and gage ports.
5. Charging valve.
6. Compressor discharge service valve.
7. Condenser pressure relief device.
8. Precharged refrigerant piping.

## 2.6 CONTROLS

- A. On outdoor unit, mount weatherproof steel control panel, containing power and control wiring, factory wired with single point power connection.
- B. Provide compressor starter, control power transformer or terminal for controls power, and condenser fan starter relay.

- C. Provide safety controls arranged so any one will shut down machine:
  - 1. High discharge pressure switch.
  - 2. Low suction pressure switch.
  - 3. Phase loss, Phase reversal, low voltage and voltage spike protection, factory or field installed on three phase units.
- D. Provide one of the following controls to permit operation down to 0 deg F ambient temperature:
  - 1. Head pressure switch to cycle fan motors in response to refrigerant condensing pressure.
  - 2. Solid state control to vary speed of one condenser fan motor in response to refrigerant condensing pressure.
  - 3. Electronic control consisting of mixing damper assembly, controlled to maintain constant refrigerant condensing pressure.
- E. Wall mounted, hard wired, programmable microprocessor controller with room sensors and self diagnostic feature. Provide locking cover.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install in accordance with manufacturer's installation instructions.
- B. Complete structural, mechanical, and electrical connections in accordance with manufacturer's installation instructions.
- C. Provide connection to refrigeration piping system and evaporators. Comply with ASHRAE 15.
- D. Furnish charge of refrigerant and oil.
- E. Charge system with refrigerant and test entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance.
- F. Provide control wiring between indoor and outdoor units.
- G. Securely fasten condensing units to housekeeping pads on roof mounting rails to withstand wind and seismic loading specified in Division 01 Section SUMMARY OF WORK.

### **END OF SECTION**

**SECTION 26 05 00****COMMON WORK RESULTS FOR ELECTRICAL****PART 1 - GENERAL****1.1 SUMMARY**

- A. The requirements contained in this Section apply to all Sections of this Division.
- B. The Division 26 Contractor shall supply, install, test and place into initial operation all equipment as noted herein in compliance with the intent of these specifications. The Division 26 Contractor shall supply all documentation and instruction as noted herein in compliance with the intent of these specifications.
- C. The drawings are generally indicative of the work to be installed but do not necessarily show all junction boxes, conduit fittings, connections, etc. as may be required to meet actual conditions.
- D. In general, circuiting shall be as shown on the drawings. Exact locations of conduit, boxes and wiring devices must be determined by the Contractor in the field and coordinated with the other trades. The Owner, through the Engineer, reserves the right to move any conduit, box or wiring device up to 25 feet before roughing in with no added cost to the Owner.

**1.2 SUMMITALS**

- A. Submittals shall be in accordance with Division 1.

**1.3 PERMITS AND INSPECTIONS**

- A. It shall be the responsibility of this Contractor to secure and pay for permits, inspections, licenses and other service fees and charges for meters and associated devices, and charges for connection to outside services as required by governing authorities for work included in this specification, except as noted elsewhere in specifications.
- B. The Contractor shall obtain approval in writing from all applicable Authorities Having Jurisdiction over this work to ensure compliance with laws and ordinances in effect. A copy of all such approvals shall be included within each Operating and Maintenance Manual.

**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.

- C. The Contractor shall guarantee, in writing, all materials and workmanship for a minimum period of one year (unless a longer warranty period is indicated in specific specification sections for specific type of equipment) from the date of written acceptance by the Owner.
- D. All electrical materials and equipment shall be UL listed for their intended purpose, unless otherwise noted.
- E. Shipping, storage and handling of all materials and equipment shall be in strict accordance with the manufacturer's instructions regarding both loading, unloading, and storing in clean, dry areas. The Contractor shall protect the electrical equipment from damage. Damaged material, whether damage in shipment, storage, handling, installation or testing, shall be repaired or replaced by the Contractor without additional cost to the Owner.

## 1.5 SITE INSPECTION

- A. The Contractor shall visit the site and become familiarized with the locations and conditions affecting the corresponding work. No allowance will be granted because of lack of knowledge of site conditions.

## 1.6 COORDINATION

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
  - 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
- C. Coordinate electrical service connections to components furnished by utility companies.
  - 1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
  - 2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.
- D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces. Access doors and panels are specified in Division 08 Section Access Doors and Frames.

## PART 2 - PRODUCTS

### 2.1 SUPPORTING DEVICES

- A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
- B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.



- C. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16 inch diameter slotted holes at a maximum of 2 inches o.c., in webs.
- D. Slotted-Steel Channel Supports: Comply with Division 05 Section Metal Fabrications for slotted channel framing.
  - 1. Channel Thickness: Selected to suit structural loading.
  - 2. Fittings and Accessories: Products of the same manufacturer as channel supports.
- E. Nonmetallic Channel and Angle Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16 inch diameter holes at a maximum of 8 inches o.c., in at least one surface.
  - 1. Fittings and Accessories: Products of the same manufacturer as channels and angles.
  - 2. Fittings and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
- F. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
- G. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- H. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
- I. Expansion Anchors: Carbon-steel wedge or sleeve type.
- J. Toggle Bolts: All-steel springhead type.
- K. Powder-Driven Threaded Studs: Heat-treated steel.

## 2.2 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

- A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.
- B. Meter Sockets: Comply with requirements of electrical power utility company.

## 2.3 CONCRETE BASES

- A. Concrete Forms and Reinforcement Materials: As specified in Division 03 Section Cast-in-Place Concrete.
- B. Concrete: 3000-psi, 28-day compressive strength as specified in Division 03 Section Cast-in-Place Concrete.

## 2.4 TOUCHUP PAINT

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 ELECTRICAL EQUIPMENT INSTALLATION**

- A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Right of Way: Give to raceways and piping systems installed at a required slope.

#### **3.2 ELECTRICAL SUPPORTING DEVICE APPLICATION**

- A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.
- B. Dry Locations: Steel materials.
- C. Support Clamps for PVC Raceways: Click-type clamp system.
- D. Selection of Supports: Comply with manufacturer's written instructions.
- E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200 pound design load.

#### **3.3 SUPPORT INSTALLATION**

- A. Install support devices to securely and permanently fasten and support electrical components.
- B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
- C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
- D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
- E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
- F. Install 1/4 inch diameter or larger threaded steel hanger rods, unless otherwise indicated.
- G. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

- H. Simultaneously install vertical conductor supports with conductors.
- I. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.
- J. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.
- K. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.
- L. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
  - 1. Wood: Fasten with wood screws or screw-type nails.
  - 2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
  - 3. New Concrete: Concrete inserts with machine screws and bolts.
  - 4. Existing Concrete: Expansion bolts.
  - 5. Instead of expansion bolts, threaded studs driven by a powder charge and provided with lock washers may be used in existing concrete.
  - 6. Steel: Welded threaded studs or spring-tension clamps on steel.
    - a. Field Welding: Comply with AWS D1.1.
  - 7. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
  - 8. Light Steel: Sheet-metal screws.
  - 9. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

### 3.4 FIRESTOPPING

- A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 07 Section Firestopping.

### 3.5 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section Cast-in-Place Concrete.

### 3.6 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

### 3.7 FIELD QUALITY CONTROL

- A. Inspect installed components for damage and faulty work.

### 3.8 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 09 Section Painting and Coating.
  - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
  - 2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
  - 3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

### 3.9 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

## END OF SECTION

**SECTION 26 05 19****LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.

**1.3 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 MANUFACTURERS**

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

**2.2 CONDUCTORS AND CABLES**

- A. Available Manufacturers:
1. General Cable Corporation.
  2. Southwire Company.
  3. Cerro Wire, Inc.
- B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

- C. Conductor Material: Copper complying with NEMA WC 70; solid or stranded conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
- D. Conductor Insulation Types: Type THW, THHN-THWN XHHW, USE, and SO complying with NEMA WC 70.
- E. Multiconductor Cable: Power and Control Tray Cable, Type TC; Metal-clad cable, Type MC; and Type SO with ground wire.

## 2.3 CONNECTORS AND SPLICES

- A. Available Manufacturers:
  - 1. AFC Cable Systems, Inc.
  - 2. Tyco International
  - 3. Hubbell/Anderson.
  - 4. O-Z/Gedney.
  - 5. 3M Company; Electrical Products Division.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- C. For connections of stranded conductors No. 10 AWG and smaller to screw terminals, provide open end spade lug connectors crimped onto ends of conductors.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR AND INSULATION APPLICATIONS

- A. Service Entrance: Type THHN-THWN, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspace: Type THHN-THWN, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
- E. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway. All homerun circuits shall be contained in conduit.
- F. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- G. Class 2 Control Circuits: Type THHN-THWN, in raceway; Power-limited cable, concealed in building finishes; Power-limited tray cable, in cable tray.
- H. Unless otherwise noted, conductor sizes given on the drawings are for Type THWN 167 deg F copper conductors, not more than 3 current carrying conductors in a raceway, in ambient temperature not exceeding 86 deg F. If other insulation types or conditions are proposed, conductor size shall be adjusted in accordance with requirements of the N.E.C. including Tables

in Section 310-25 at no increase of cost to the Owner; however size shall not be decreased without written approval. Install not more than 3 current carrying conductors larger than No. 10 AWG in a single raceway without written approval. Install not more than 9 current carrying conductors No. 10 AWG or smaller in a single raceway

### 3.2 INSTALLATION

- 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.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Section Common Work Results for Electrical.
- F. Seal around cables penetrating fire-rated elements according to Division 07 Section Firestopping.
- G. Identify and color-code conductors and cables according to Division 26 Section Identification for Electrical Systems.

### 3.3 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.

**END OF SECTION**

**SECTION 26 05 26****GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

**B. Related Sections:**

1. Division 33 Section Underground Electrical Distribution for ground test wells.

**1.2 SUBMITTALS****A. Product Data:** For each type of product indicated.**B. Product Data:** For the following:

1. Ground rods.

**1.3 Qualification Data:** For firms and persons specified in "Quality Assurance" Article.**1.4 Field Test Reports:** Submit written test reports to include the following:**A. Test procedures used.****B. Test results that comply with requirements.****C. Results of failed tests and corrective action taken to achieve test results that comply with requirements.****1.5 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.

1. Comply with UL 467.



**PART 2 - PRODUCTS****2.1 GROUNDING CONDUCTORS**

- A. For insulated conductors, comply with Division 26 Section Low-Voltage Electrical Power Conductors and Cables.
- B. Material: Copper.
- C. Equipment Grounding Conductors: Insulated with green-colored insulation.
- D. Isolated Ground Conductors: Insulated with green-colored insulation with yellow stripe. On feeders with isolated ground, use colored tape, alternating bands of green and yellow tape to provide a minimum of three bands of green and two bands of yellow.
- E. Grounding Electrode Conductors: Stranded cable.
- F. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.
- G. Bare Copper Conductors: Comply with the following:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Assembly of Stranded Conductors: ASTM B 8.
- H. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

**2.2 CONNECTOR PRODUCTS**

- A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
- B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.
- C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

**2.3 GROUNDING ELECTRODES**

- A. Ground Rods: Copper-clad steel.
- B. Ground Rods: Sectional type; copper-clad steel.
  - 1. Size: 3/4 inch diameter by 120 inches long.

**PART 3 - EXECUTION****3.1 APPLICATION**

- A. In raceways, use insulated equipment grounding conductors.

- B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.
- C. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
- D. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.
- E. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
  - 1. Use insulated spacer; space 1 inch from wall and support from wall 6 inches above finished floor, unless otherwise indicated.
  - 2. At doors, route the bus up to the top of the door frame, across the top of the doorway, and down to the specified height above the floor.

### 3.2 EQUIPMENT GROUNDING CONDUCTORS

- A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
- B. Install equipment grounding conductors in all feeders and branch circuits and as required by applicable codes.

### 3.3 INSTALLATION

- A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.
  - 1. Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
  - 2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make connections without exposing steel or damaging copper coating.
- B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.
- D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

- E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.
- F. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.
- G. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

### 3.4 FIELD QUALITY CONTROL

- A. Testing: Perform the following field quality-control testing:
  - 1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
  - 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the 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. Perform tests, by the fall-of-potential method according to IEEE 81.
  - 3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
    - a. Equipment Rated 500 kVA and Less: 10 ohms.
    - b. Equipment Rated 500 to 1000 kVA: 5 ohms.
    - c. Equipment Rated More Than 1000 kVA: 3 ohms.
  - 4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Contracting Officer promptly and include recommendations to reduce ground resistance.

**END OF SECTION**

**SECTION 26 05 33****RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes: Raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

**1.2 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. RMC: Rigid metal conduit.
- D. IMC: Intermediate metal conduit.
- E. LFMC: Liquidtight flexible metal conduit.
- F. RNC: Rigid nonmetallic conduit.

**1.3 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. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. EMT and Fittings: ANSI C80.3.
  - 1. Fittings: Set-screw or compression type.
- D. FMC: Zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket.

- F. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

## 2.2 NONMETALLIC CONDUIT AND TUBING

- A. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.
- B. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.
- C. LFNC: UL 1660.

## 2.3 METAL WIREWAYS

- A. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1 or 3R as appropriate for location.
- B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
- D. Wireway Covers: Hinged type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

## 2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
- C. Floor Boxes: Cast metal, fully adjustable, rectangular.
- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- E. Cast-Metal Pull and Junction Boxes: NEMA FB 1, galvanized cast iron or cast aluminum with gasketed cover.
- F. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.
  - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
- G. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

**PART 3 - EXECUTION****3.1 RACEWAY APPLICATION****A. Outdoors:**

1. Exposed: Rigid steel or IMC.
2. Concealed: Rigid steel or IMC.
3. Underground, Single Run: RNC.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures: NEMA 250, Type 3R

**B. Indoors:**

1. Exposed: EMT; RMC where likely to be physically damaged; Schedule 40 PVC only in refrigerated cooler boxes, above 48 inches AFF.
2. Concealed: EMT or RMC.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet Locations: Schedule 40 PVC.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
  - a. Damp or Wet Locations: NEMA 250, Type 4X, stainless steel in food prep or display areas,

**C. Minimum Raceway Size: 3/4-inch trade size.****3.2 INSTALLATION**

- A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- B. Complete raceway installation before starting conductor installation.
- C. Provide pull boxes as required to facilitate pulling in conductors.
- D. Install temporary closures to prevent foreign matter from entering raceways.
- E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.
- F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
  1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
- H. Raceways Embedded in floor slabs are not allowed.

- I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
  - 1. Run parallel or banked raceways together on common supports.
  - 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways. Take care that all conduits of a parallel circuit are of equal length from source to load.
- J. Tighten set screws of threadless fittings with suitable tools.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200 pound tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- M. Stub-up Connections: Where specifically shown on drawings, extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC or LFMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
- N. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semirecessed lighting fixtures; for transformers and other equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
- O. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
- P. Set floor boxes level and flush with finished floor surface.

### 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 PVC or paint finishes with matching touchup coating recommended by manufacturer.

### END OF SECTION

**SECTION 26 05 53****IDENTIFICATION FOR ELECTRICAL SYSTEMS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes: Electrical identification materials and devices required to comply with ANSI C2, NFPA 70, OSHA standards, and Authorities Having Jurisdiction.

**1.2 SUBMITTALS**

- A. Product Data: For each electrical identification product indicated.

**1.3 QUALITY ASSURANCE**

- A. Comply with ANSI C2.
- B. Comply with NFPA 70.
- C. Comply with ANSI A13.1 and NFPA 70 for color-coding.
- D. Comply with ANSI Z535.

**PART 2 - PRODUCTS****2.1 RACEWAY AND CABLE LABELS**

- A. Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
  - 1. Color: Black letters on orange field.
  - 2. Legend: Indicates voltage.
- B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend overlaminated with a clear, weather- and chemical-resistant coating.
- C. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- D. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape.
  - 1. Not less than 6 inches wide by 4 mils thick.
  - 2. Compounded for permanent direct-burial service.
  - 3. Embedded continuous metallic strip or core.
  - 4. Printed legend indicating type of underground line.



- E. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

## 2.2 NAMEPLATES AND SIGNS

- A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.
- B. Danger, Warning, and Caution Labels: Where danger, warning, or caution labels are required, field applied labels shall be permanently affixed to the equipment or wiring method, and shall be of sufficient durability to withstand the environment. Labels shall adequately warn of the particular hazard using effective words, colors, symbols. Labels shall conform to ANSI Z535.
- C. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.
  - 1. Engraved legend with black letters on white face.
  - 2. Punched or drilled for mechanical fasteners.
- D. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4 inch grommets in corners for mounting.
- E. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for the application. 1/4 inch grommets in corners for mounting.
- F. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.
- D. Install painted identification according to manufacturer's written instructions and as follows:
  - 1. Clean surfaces of dust, loose material, and oily films before painting.
  - 2. Prime surfaces using type of primer specified for surface.
  - 3. Apply one intermediate and one finish coat of enamel.
- E. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage, panel, and circuit number(s) with black letters on yellow background. Install on exterior of door or cover.

- F. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches overall, use a single line marker. Install line marker for underground wiring, both direct-buried cables and cables in raceway.
- G. Color-Coding of Secondary Phase Conductors: Use industry standard colors for color for ungrounded service, feeder, and branch circuit conductors.
1. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:
- H. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.
1. Legend: 1/4 inch steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
  2. Tag Fasteners: Nylon cable ties.
  3. Band Fasteners: Integral ears.
- I. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2 inch high lettering on 1-1/2 inch high label; where two lines of text are required, use labels 2 inches. Use black lettering on white field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:
1. Panelboards, electrical cabinets, and enclosures.
  2. Access doors and panels for concealed electrical items.
  3. Emergency system boxes and enclosures.
  4. Disconnect switches.
  5. Enclosed circuit breakers.
  6. Push-button stations.
  7. Dimmers.
  8. Control devices.

**END OF SECTION**

## **SECTION 26 09 23**

### **LIGHTING CONTROL DEVICES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

###### **A. Section Includes:**

1. The following lighting control devices:
  - a. Switch-box occupancy sensors.
  - b. Indoor occupancy sensors.
  - c. Outdoor motion sensors.

##### **1.2 SUBMITTALS**

- ###### **A. Product Data:** For each type of product indicated.

##### **1.3 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.

#### **PART 2 - PRODUCTS**

##### **2.1 OUTDOOR PHOTOELECTRIC SWITCHES**

- ###### **A. Description:** Solid state, with SPST dry contacts rated for 1000-VA solid state, to operate connected relay, contactor coils, microprocessor input, and complying with UL 773A.
1. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
  2. Time Delay: 15-second minimum, to prevent false operation.
  3. Surge Protection: Metal-oxide varistor type, complying with IEEE C62.41 for Category A1 locations.
  4. Mounting: Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the North sky exposure.

##### **2.2 INDOOR PHOTOELECTRIC SWITCHES**

- A. Ceiling-Mounting Photoelectric Switch: Solid-state, light-level sensor unit, with separate relay unit mounted on luminaire, to detect changes in lighting levels that are perceived by the eye. Cadmium sulfide photoresistors are not acceptable.
1. Sensor Output: Contacts rated to operate the associated relay, complying with UL 773A. Sensor shall be powered from the relay unit.
  2. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
  3. Light-Level Monitoring Range: 10 to 200 fc, with an adjustment for turn-on and turn-off levels within that range.
  4. Time Delay: Adjustable from 5 to 300 seconds to prevent cycling, with deadband adjustment.
  5. Indicator: Two LEDs to indicate the beginning of on and off cycles.

### 2.3 SWITCH-BOX OCCUPANCY SENSORS

- A. Description: PIR type with integral power-switching contacts rated for 800 W at 120-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/6-hp motors; and rated for 1000 W at 277-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, LED light fixtures, or 1/3-hp motors, minimum.
1. Include ground wire.
  2. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.

### 2.4 INDOOR OCCUPANCY SENSORS

- A. General Description: Wall- or ceiling-mounting, solid-state units with a separate relay unit.
1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
  2. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit.
  3. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
  4. Mounting:
    - a. Sensor: Suitable for mounting in any position on a standard outlet box.
    - b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
    - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
  5. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
  6. Bypass Switch: Override the on function in case of sensor failure.
  7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.

- B. PIR Type: Ceiling mounting; detect occupancy by sensing a combination of heat and movement in area of coverage.
  - 1. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in.
  - 2. Detection Coverage (Room): Detect occupancy anywhere in a circular area of 1000 sq. ft. when mounted on a 96-inch-high ceiling.
  - 3. Detection Coverage (Corridor): Detect occupancy within 90 feet when mounted on a 10-foot-high ceiling.
- C. Ultrasonic Type: Ceiling mounting; detect occupancy by sensing a change in pattern of reflected ultrasonic energy in area of coverage.
  - 1. Detector Sensitivity: Detect a person of average size and weight moving at least 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
  - 2. Detection Coverage (Small Room): Detect occupancy anywhere within a circular area of 600 sq. ft. when mounted on a 96-inch-high ceiling.
  - 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on an 8-foot-high ceiling.
  - 4. Detection Coverage (Large Room): Detect occupancy anywhere within a circular area of 2000 sq. ft. when mounted on a 96-inch-high ceiling.
  - 5. Detection Coverage (Corridor): Detect occupancy anywhere within 90 feet when mounted on a 10-foot-high ceiling in a corridor not wider than 14 feet.
- D. Dual-Technology Type: Ceiling mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit.
  - 1. Sensitivity Adjustment: Separate for each sensing technology.
  - 2. Detector Sensitivity: Detect occurrences of 6-inch minimum movement of any portion of a human body that presents a target of at least 36 sq. in., and detect a person of average size and weight moving at least 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
  - 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch-high ceiling.

### PART 3 - EXECUTION

#### 3.1 SENSOR INSTALLATION

- A. Install and aim sensors in locations to achieve at least 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions. Set time delay to 5 minutes unless indicated otherwise.

#### 3.2 WIRING INSTALLATION

- A. Wiring Method: Comply with Division 26 Section Low-Voltage Electrical Power Conductors and Cables. Minimum conduit size shall be 1/2 inch.
- B. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

### 3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 26 Section Identification for Electrical Systems.

### 3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. After installing sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
  - 2. Operational Test: Verify actuation of each sensor and adjust time delays.
- B. Remove and replace lighting control devices where test results indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose.

## END OF SECTION

**SECTION 26 24 16****PANELBOARDS****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Lighting and appliance branch-circuit panelboards.

**1.2 DEFINITIONS**

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.

**1.3 SUBMITTALS**

- A. Product Data: For each type of panelboard, overcurrent protective device, surge protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Enclosure types and details for types other than NEMA 250, Type 1.
    - b. Bus configuration, current, and voltage ratings.
    - c. Short-circuit current rating of panelboards and overcurrent protective devices.
    - d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components, sufficient for selective coordination study.
- C. Panelboard Schedules: 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. In addition to items specified in Division 01 Section Closeout Procedures, include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

#### 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.
- B. 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.
- C. Comply with NEMA PB 1.
- D. Comply with NFPA 70.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
    - a. Eaton Corporation; Cutler-Hammer Products.
    - b. General Electric Co.; Electrical Distribution & Protection Div.
    - c. Siemens Energy & Automation, Inc.
    - d. Square D.

#### 2.2 MANUFACTURED UNITS

- A. Enclosures: Flush or Surface-mounted cabinets as scheduled. NEMA PB 1, Type 1.
  1. Rated for environmental conditions at installed location.
    - a. Outdoor Locations: NEMA 250, Type 3R.
    - b. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
    - c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
    - d. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  2. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
  3. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.
- B. Phase and Ground Buses:



1. Material: Hard-drawn copper, 98 percent conductivity.
2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box. All panelboards.
3. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box. Where scheduled.
4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads. Where scheduled.
5. Split Bus: Vertical buses divided into individual vertical sections. Where scheduled.

C. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Compression type.
2. Ground Lugs and Bus Configured Terminators: Compression type.
3. Feed-Through Lugs: Where scheduled or required, Compression type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
4. Extra-Capacity Neutral Lugs: Where scheduled or required, Rated 200 percent of phase lugs mounted on extra-capacity neutral bus.

D. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

E. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices. Provide where spaces are scheduled.

## 2.3 PANELBOARD SHORT-CIRCUIT RATING

A. Fully rated to interrupt symmetrical short-circuit current available at terminals.

## 2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Concealed hinges, door in door construction secured with flush latch with tumbler lock; keyed alike.

## 2.5 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: UL 489, with interrupting capacity to meet available fault currents. Multipole units enclosed in a single housing, all poles common trip, with a single handle to operate as a single unit.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic trip-unit circuit breakers shall have RMS sensing; field-replaceable rating plug; and with the following field-adjustable settings:
  - a. Instantaneous trip.

- b. Long- and short-time pickup levels.
  - c. Long- and short-time time adjustments.
  - d. Ground-fault pickup level, time delay, and  $I^2t$  response.
- 4. GFCI Circuit Breakers: Single- and two-pole configurations with 5mA trip sensitivity for personnel protection and 30mA sensitivity for equipment protection (i.e. heat trace cables).
- B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
  - 1. Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
  - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
  - 4. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
  - 5. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- C. Install overcurrent protective devices and controllers.
  - 1. Set field-adjustable switches and circuit-breaker trip ranges.
- D. Install filler plates in unused spaces.
- E. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade, with caps.
- F. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.
- G. Working Clearance: Provide minimum of 48" working clearance free of obstructions directly in front of equipment. The space equal to the width and depth of the equipment and extending to a height of 6 ft. above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No pipes, ducts, or other equipment foreign to the electrical installation shall be located in this zone.

### 3.2 IDENTIFICATION

- A. Identify panelboards, field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section Identification for Electrical Systems.
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

### 3.3 CONNECTIONS

- A. Ground equipment according to Division 26 Section Grounding and Bonding for Electrical Systems.
- B. Connect wiring according to Division 26 Section Low-Voltage Electrical Power Conductors and Cables.

### 3.4 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- B. Load Balancing: After Substantial Completion, but not more than 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. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment. Use colored tape banding to revise the color code of conductors changed to a different phase, at the panel and at the load.
  - 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
  - 4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

### 3.5 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

**END OF SECTION**

**SECTION 26 27 26****WIRING DEVICES****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Single and duplex receptacles, ground-fault circuit interrupters.
2. Single- and double-pole snap switches and dimmer switches.
3. Device wall plates.

**1.2 DEFINITIONS**

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. PVC: Polyvinyl chloride.
- D. RFI: Radio-frequency interference.
- E. SPD : Surge protective device.
- F. UTP: Unshielded twisted pair.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.

**1.4 QUALITY ASSURANCE**

- A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.
- B. 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.
- C. Comply with NFPA 70.

**1.5 COORDINATION**

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. Wiring Devices:
    - a. Eagle Electric Manufacturing Co., Inc.
    - b. Hubbell Incorporated.
    - c. Leviton Mfg. Company Inc.
    - d. Pass & Seymour/Legrand; Wiring Devices Div.
  2. Multioutlet Assemblies:
    - a. Hubbell Incorporated.
    - b. Wiremold Company (The).

### **2.2 RECEPTACLES**

- A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.
- B. Straight-Blade and Locking Receptacles: Heavy -Duty grade.
- C. GFCI Receptacles: Straight blade, non-feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.

### **2.3 SWITCHES**

- A. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.
- B. Snap Switches: Heavy-Duty grade, quiet type.
- C. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on/off switches and audible frequency and EMI/RFI filters.
  1. Control: Continuously adjustable slider; with single-pole or three-way switching to suit connections.
  2. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable rotary knob, toggle switch, or slider; single pole with soft tap or other quiet switch; EMI/RFI filter to eliminate interference; and 5-inch wire connecting leads.
  3. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness. Dimmer shall be compatible with the fluorescent luminaire ballast it is connected to.
  4. LED Dimmers: Compatible with LED drivers; 1-10 Volt dimming with low end not greater than 10 percent of full brightness.

## 2.4 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
  - 1. Plate-Securing Screws: Metal with head color to match plate finish.
  - 2. Material for Finished Spaces: 0.035-inch- thick, satin-finished stainless steel.
  - 3. Material for Unfinished Spaces: Galvanized steel.
  - 4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install devices and assemblies level, plumb, and square with building lines.
- B. Install wall dimmers to achieve indicated rating after derating for ganging according to manufacturer's written instructions.
- C. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates. Group adjacent voice or data outlets under single, multigang wall plates.
- D. Remove wall plates and protect devices and assemblies during painting.
- E. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

### 3.2 IDENTIFICATION

- A. Comply with Division 26 Section Identification for Electrical Systems.
  - 1. Receptacles: Identify panelboard and circuit number from which served. Use engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

### 3.3 CONNECTIONS

- A. Ground equipment according to Division 26 Section Grounding and Bonding for Electrical Systems.
- B. Connect wiring according to Division 26 Section Low-Voltage Electrical Power Conductors and Cables. Provide open-end spade lug type connectors crimped onto ends of conductors where stranded conductors are connected to device screw terminals.
- C. 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.

### 3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
  - 2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- B. Remove malfunctioning units, replace with new units, and retest as specified above.

**END OF SECTION**

**SECTION 26 28 16****ENCLOSED SWITCHES AND CIRCUIT BREAKERS****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Individually mounted, enclosed switches and circuit breakers:
  - a. Fusible switches.
  - b. Nonfusible switches.
  - c. Enclosures.

**1.2 DEFINITIONS**

- A. GD: General duty.
- B. GFCI: Ground-fault circuit interrupter.
- C. HD: Heavy duty.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.

**1.3 SUBMITTALS**

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
  1. Enclosure types and details for types other than NEMA 250, Type 1.
  2. Current and voltage ratings.
  3. Short-circuit current rating.
  4. UL listing for series rating of installed devices.
  5. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

**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.



- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

## PART 2 - PRODUCTS

### 2.1 FUSIBLE AND NONFUSIBLE SWITCHES

- A. Available Manufacturers:
  - 1. Eaton Corporation.
  - 2. General Electric Co.; Electrical Distribution & Control Division.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D/Group Schneider.
- B. Fusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Nonfusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- D. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
  - 3. Auxiliary Contact Kit: Auxiliary set of contacts arranged to open before switch blades open.

### 2.2 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

- A. Available Manufacturers:
  - 1. Eaton Corporation.
  - 2. General Electric Co.; Electrical Distribution & Control Division.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D/Group Schneider.
- B. Molded-Case Switches: Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.
- C. Molded-Case Switch Accessories:
  - 1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
  - 2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Key Interlock Kit: Externally mounted to prohibit operation; key shall be removable only when switch is in off position.

## 2.3 ENCLOSURES

- A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.
  - 1. Outdoor Locations: NEMA 250, Type 3R.
  - 2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
  - 3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.
- B. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated. Anchor floor-mounting switches to concrete base.
- C. Working Clearance: Provide minimum of 48" working clearance free of obstructions directly in front of equipment. The space equal to the width and depth of the equipment and extending to a height of 6 ft above the equipment or to the structural ceiling, whichever is lower, shall be dedicated to the electrical installation. No pipes, ducts, or other equipment foreign to the electrical installation shall be located in this zone.

### 3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section Identification for Electrical Systems.
- B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Division 26 Section Identification for Electrical Systems.

### 3.3 FIELD QUALITY CONTROL

- A. Prepare for acceptance testing as follows:
  - 1. Inspect mechanical and electrical connections.
  - 2. Verify switch and relay type and labeling verification.
  - 3. Verify rating of installed fuses.
  - 4. Inspect proper installation of type, size, quantity, and arrangement of mounting or anchorage devices complying with manufacturer's certification.
  - 5. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

## END OF SECTION

## **SECTION 26 51 00**

### **INTERIOR LIGHTING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

**A. Section Includes:**

1. Interior lighting fixtures with lamps and ballasts.
2. Lighting fixtures mounted on exterior building surfaces.
3. Emergency lighting units.
4. Exit signs.

##### **1.2 SUBMITTALS**

**A. Product Data:** For each type of lighting fixture scheduled, arranged in order of fixture designation. Include data on features, accessories, finishes, photometric performance data, and the following:

1. Physical description of fixture, including dimensions and verification of indicated parameters.
2. Coefficient of Utilization Chart
3. Emergency lighting unit battery and charger.
4. LED drivers.

**B. Wiring Diagrams:** Power, signal, and control wiring.

**C. Product Certificates:** For each type of ballast for dimmer-controlled fixtures, signed by product manufacturer.

**D. Field quality-control test reports.**

**E. Operation and Maintenance Data:** For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section Closeout Procedures, include the following:

1. Catalog data for each fixture. Include the diffuser, ballast, and lamps installed in that fixture.
2. List of lamp requirements for each room (for relamping purposes), including: fixture Drawing designation(s) in which lamp is used; the full lamp description; full ordering code or manufacturer's product number; total quantity of lamps installed.

**F. Warranties:** Special warranties specified in this Section.

### 1.3 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.
- C. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

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

### 2.2 FIXTURES AND COMPONENTS, GENERAL

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- C. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- E. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
  - 1. White Surfaces: 85 percent.
  - 2. Specular Surfaces: 83 percent.
  - 3. Diffusing Specular Surfaces: 75 percent.
  - 4. Laminated Silver Metallized Film: 90 percent.
- F. Plastic Diffusers, Covers, and Globes:
  - 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.
    - a. Lens Thickness: At least 0.125 inch minimum unless different thickness is scheduled.
    - b. UV stabilized.
  - 2. Glass: Annealed crystal glass, unless otherwise indicated.

## 2.3 EXIT SIGNS

- A. General: Comply with UL 924; for sign colors and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:
  - 1. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum of rated lamp life.
- C. Stand By Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
  - 1. Battery: Sealed, maintenance-free, nickel-cadmium type with special warranty.
  - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
  - 3. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.

## 2.4 EMERGENCY LIGHTING UNITS

- A. General: Self-contained units complying with UL 924.
  - 1. Battery: Sealed, maintenance-free, lead-acid type with minimum 10-year nominal life and special warranty.
  - 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
  - 3. Operation: Relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
  - 4. Wire Guard: Where indicated, heavy-chrome-plated wire guard protects lamp heads or fixtures.

## 2.5 LED LIGHTING MODULES

- A. Light Emitting Diode lighting modules shall be as scheduled, with the following technical characteristics, unless scheduled otherwise:
  - 1. Rated life: 55,000 hours.
  - 2. Efficacy: 85-110 lumens/watt minimum.
  - 3. Color Temperature: 5000K to 6500K (in utility or back-room areas); 3500K in public areas.
  - 4. CRI: 70 (minimum in utility or back-room areas); 85 in public areas.
  - 5. Dimmable to 20 percent of maximum.

## 2.6 FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 26 Section Common Work Results for Electrical for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated, 12 gage.
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.
- F. Rod Hangers: 3/16-inch- minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

## 2.7 FINISHES

- A. Fixtures: Manufacturers' standard, unless otherwise indicated.
  - 1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
  - 2. Metallic Finish: Corrosion resistant.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Support for Fixtures in or on Grid-Type Suspended Ceilings:
  - 1. Provide safety wires / hangers for light fixtures:
    - a. Lighting fixtures weighing less than or equal to 10 lb (5kg) shall have one, No. 12 gauge (2.70 mm) safety wire connected from the fixture housing (not detachable end plates) to the structure above. It is not necessary for these safety wires to be taut.
    - b. Lighting fixtures weighing greater than 10 lb (5 kg.) but less than or equal to 56 lb (25 kg) shall have two No. 12-gauge (2.70 mm) safety wires connected from the fixture housing (not the detachable end plates) to the structure above that act as safety wires. It is not necessary for these safety wires to be taut.
    - c. Lighting fixtures weighing greater than 56 lb (25 kg) or more shall be supported directly from the structure above by approved hangers.
  - 2. Support Clips: Fasten to fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
  - 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
  - 4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
- C. Suspended Fixture Support: As follows:
  - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
  - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
  4. Continuous Rows: Suspend from cable.
- D. Air-Handling Fixtures: Install with dampers closed and ready for adjustment.
- E. Adjust aimable fixtures to provide required light intensities.

### 3.2 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. Connect dual-circuited fixtures in a common area so that the same group of lamps in each fixture are connected to the same circuit to provide a uniform appearance.

### 3.3 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Verify normal operation of each fixture after installation.
- C. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify normal transfer to battery power source and retransfer to normal.
- D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
- E. Corroded Fixtures: During warranty period, replace fixtures that show any signs of corrosion.

### END OF SECTION

**SECTION 312000 - EARTH MOVING****PART 1 - GENERAL****1.1 SUMMARY**

A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade, walks, pavements, structures and lawns.
2. Base course for structures, pavements and walks.
3. Excavating and backfilling for utility trenches.

**1.2 DEFINITIONS**

A. Backfill: Soil 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. Base Course: Course placed between the subgrade and paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil from designated area on site or imported from off-site for use as fill or backfill.

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. 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 - Earth: Soil materials used to raise existing grades.

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.



- H. Structures: Structures, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base course, geogrid, geofabrics or topsoil materials.
- J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

### **1.3 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Each type of plastic warning tape.
  - 2. Geotextile filter fabrics.
- B. Samples: 12-by-12-inch Sample of all types of filter fabric used.
- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
  - 1. Classification according to ASTM D 2487 of each on-site and off-site borrow soil material proposed for fill and backfill for use under the pavilion.
  - 2. Laboratory compaction curve according to ASTM D 698 for each on-site and off-site borrow soil material proposed for fill and backfill under the pavilion.

### **1.4 QUALITY ASSURANCE**

- A. Pre-excavation Conference: Conduct conference at Project site.

### **1.5 PROJECT CONDITIONS**

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
  - 1. Notify Architect and Owner not less than two days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Architect's written permission.
  - 3. Contact utility-locator service for area where Project is located before excavating.

- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.
- C. Removal of existing structures, pavements and other above ground and below ground improvements are covered in Division 31, "Site Clearing."

## **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: ASTM D 2487 Soil Classification Group CL (lean clay soils), free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils:
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
  - 2. On site topsoil and the top section of the soils where rootlets extend and any other organic-containing soils are not suitable for use as engineered fill in structural areas. These soils can be used for fill in lawn and planting areas.
  - 3. Moderate to highly plastic clay soils are not suitable for use as engineered fill material under structures and pavements.
  - 4. Frozen soils.
- D. Base Course – Walks: Crushed stone.
- E. Engineered Fill shall be approved and tested by the onsite inspector either prior to placement, after each lift or as determined by the on site special inspector and Architect and per requirements below:
  - 1. On-site soils may be used for fill material and shall meet the requirements below:
    - a. Free of topsoil, organic materials, trash, debris and other deleterious materials.
    - b. Lean Clay soil material.
    - c. Durable rock fragments less than 2 inches in any dimension.
    - d. Soils are within 2 percent of optimum moisture content as determined by ASTM D-698.
    - e. Plasticity index of less than 20.
    - f. Liquid Limit of less than 40.
    - g. Standard Proctor maximum dry density over 100.0 pounds per cubic foot.

2. Imported Fill Materials:

- a. Free of topsoil, organic materials, trash, debris and other deleterious materials.
- b. Lean Clay Soil material.
- c. Durable rock fragments less than 2 inches in any dimension.
- d. Soils are within 2 percent of optimum moisture content as determined by ASTM D-698.
- e. Plasticity index of less than 20.
- f. Liquid Limit of less than 40.
- g. Standard Proctor maximum dry density over 100.0 pounds per cubic foot.

3. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

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 sieve and not more than 8 percent passing a No. 200 sieve.

G. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

## 2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following:

- 1. Subject to compliance with requirements, provide needle punched nonwoven, 4 ounce fabric listed for use as separation and drainage fabric.
  - a. For use as a separation between existing soils, drainage stone and the pea gravel for the French drain.

## 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 wide and 4 mils 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 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 earthwork operations.
- B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."
- C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.
- D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures, frost, rain and runoff.
- E. Strip and stockpile topsoil / near surface soils within the limits of construction, in location approved by the Architect, on site prior to beginning mass earth moving operations. Do not haul off or remove topsoil from the site until all areas have been properly filled with topsoil and finished grades have been achieved.
- F. The combination of heavy construction equipment traffic and excess surface moisture can cause pumping and deterioration of the near surface soils (prepared subgrade).
  1. The site subgrades should be maintained by the contractor by grading out ruts or areas that will collect water. The site subgrades should not be allowed to pond surface water and should be dewatered as necessary.

### **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. Positive surface and subsurface drainage should be established at the start of construction, maintained during the work and incorporated into the final design to prevent surface water ponding and saturation of subgrade and in place engineered fill.
  - 2. 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. Reroute surface water runoff from the existing buildings, away from new construction as required.
  - 4. Existing Buildings have multiple underground roof lines that have not been identified on the survey. These lines will most likely be intercepted during earthwork and demolition operations. These lines must be rerouted on a temporary basis to prevent roof runoff from entering the new construction area. Coordination with Storm Drainage Project (By Others) will be required to ensure that new work is not damaged.

### 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.
  - 3. Removal of existing structures, etc. is covered under Division 31 "Site Clearing."
  - 4. The project consists primarily of soil fill operations after demolition of existing improvements.

### 3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch.
  - 1. Excavations for Footings: 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.

2. Trench for footers after subgrades have been brought to required elevations and have been properly proof rolled and tested. After a satisfactory subgrade has been established, proceed with trenching for seat wall footers.

### **3.6 EXCAVATION FOR WALKS AND PAVEMENTS**

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### **3.7 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 where required.
- B. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
- C. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe where applicable.

### **3.8 SUBGRADE INSPECTION**

- A. Notify Architect when excavations have reached required subgrade.
- B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Remove all loose surface soil, topsoil and other unsuitable materials prior to placement of engineered fill.
- D. When excavations have reached subgrade elevations, proof-roll subgrade below the pavilion concrete pavement, unit paver walks and any required engineered fill with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Proof roll an area 5 feet beyond the walk perimeter around the pavilion.
  1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
  2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 20 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted engineered backfill as directed by the Architect.
  4. Proof roll existing subgrades in areas of fill prior to placement of fill material.
  5. If the existing subgrade surface becomes unsuitable due to construction traffic, exposure to moisture or other conditions detrimental to soils after acceptable proof-rolling, contractor will disk, aerate, scarify the top 12 inches and re-compact to required degree of compaction at no cost to the owner. Proof roll to obtain approval prior to placement of fill.
- E. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- F. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

### **3.9 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. Use fill materials approved by Architect.
1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

### **3.10 STORAGE OF SOIL MATERIALS**

- A. Stockpile borrow soil materials, excavated satisfactory/unsatisfactory soil materials, topsoil and old fill material 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.
  2. Stockpile soil materials in a location acceptable to the Architect.
  3. This area will need to be prepared to receive stock piled soil materials according to Division 31, 'Site Clearing'.

### **3.11 BACKFILL**

- A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade.
  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.
  8. Removal of loose soil and other unsuitable materials.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.
- C. Backfill voids created from removal of existing structures (catch basins, storm pipes, utilities etc) with approved engineered fill.

### **3.12 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. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- D. Backfill voids with satisfactory soil while installing and removing shoring and bracing.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### **3.13 SOIL FILL**

- A. After Demolition and removal of all existing site features, and prior to filling operations, scarify the top 8" of the existing subgrade and re-compact to 95%.
- B. Place and compact fill material in layers to required elevations as follows:
1. Under lawns and planted areas, use satisfactory soil material.
  2. Under walks and pavements, use satisfactory soil material.
  3. Under seat wall footers, pavilion foundations and the pavilion pavements use engineered soil fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.



- D. At the end of each day or prior to a forecasted rain event, all installed lifts shall be drum rolled smooth to prevent ponding of water and to facilitate water to run off. Surface water shall not be allowed to pond on the surface, in tire ruts or trench excavations.

### **3.14 SOIL MOISTURE CONTROL**

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within plus or minus (+/-) 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.
  - 2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### **3.15 COMPACTION OF SOIL BACKFILLS AND FILLS**

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches 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. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
  - 1. Engineered fill under the proposed building, compact each layer of backfill or fill soil material at 98 percent.
  - 2. Under walkways compact each layer of backfill or fill soil material at 95 percent.
  - 3. All aggregate base layers should be compacted to a minimum of 95 percent.
  - 4. Under lawn or unpaved areas, compact each layer of backfill or fill soil material to within a range between 85 and 90 percent. If soils compactions are higher than specified, the contractor will be responsible for disking, aerating or spading the soils to a depth of 8" to create a suitable subgrade growing condition for lawns and plants.
  - 5. For utility trenches, compact each layer of initial and final backfill soil material to similar compaction requirements of the soils/finished surface above the utility.
  - 6. All lifts are to be monitored and shall receive field density tests as the lifts are being placed in order to verify that compaction standards are met. Refer to Special Inspections and Field Quality Control herein.

**3.16 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.
  - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.
    - a. Where ADA (American with Disabilities Act) slope requirements are required, plus or minus 1/4 inch.
  - 3. Pavements: Plus or minus 1/2" inch.
    - a. Where ADA (American with Disabilities Act) slope requirements are required, plus or minus 1/4 inch.

**3.17 BASE COURSES**

- A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
  - 1. Place base course material over subgrade under pavements.
  - 2. Shape base course to required crown elevations and cross-slope grades.
  - 3. Place base course 6 inches or less in compacted thickness in a single layer.
  - 4. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 5. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.
- C. Pavement Shoulders: Place geotextile separation fabric as indicated on the plans and details to prevent lateral movement of soils into subbase and base course drainage aggregates.

**3.18 GEOTEXTILE FILTER FABRICS**

- A. Install per manufacturer's written instructions.

**3.19 FIELD QUALITY CONTROL**

- A. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Testing of soils is only required for the area under and around the Pavilion structure, storm pipe and utility backfill where the lines cross underneath walks (test 3 feet beyond edge of walks).
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 6938, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
  - 1. Pavilion Paved Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 500 sq. ft. or less of paved area.
  - 2. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each area where utility or storm lines cross under walks.
  - 3. Pavilion and Seat Wall Foundations/Footings: Provide 1 test per 25 liner feet of exposed subgrade for wall footings and 1 test per pavilion column foundation at subgrade. If the Testing agency can visually inspect and determine that existing subgrade is suitable for foundations, then this is acceptable.
  - 4. Proof roll under the pavilion area as noted earlier in this specification.
- 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 to depth required; re-compact and retest until specified compaction is obtained.
- F. Provide written reports indicating the fill materials and the exposed subgrades are suitable to support the proposed improvements.

**3.20 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 re-compact.
  2. The site subgrades should be maintained by the contractor by grading out ruts or areas that will collect water. The site subgrades should not be allowed to pond surface water and should be dewatered as necessary.
- 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.

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

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

### **END OF SECTION**

**SECTION 313116 - TERMITE CONTROL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following for termite control:
  - 1. Soil treatment.

**1.3 DEFINITIONS**

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest control operator.

**1.4 SUBMITTALS**

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods, volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.
  - 8. Dated report for each monitoring and inspection occurrence indicating level of termite activity, procedure, and treatment applied before time of Substantial Completion.
  - 9. Brand name and manufacturer of termiticide.

10. Quantities of termite bait used.

D. Warranties: Special warranties specified in this Section.

#### 1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

#### 1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

#### 1.8 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- C. Warranty Period: Three years from date of Substantial Completion.

**PART 2 - PRODUCTS****2.1 SOIL TREATMENT**

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

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.
- C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

**3.3 APPLICATION, GENERAL**

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

### 3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
  - 1. Slabs-on-Grade: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  - 3. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 313116



**SECTION 321216 – ASPHALT PAVING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.
- B. Standard Specifications For Road and Bridge Construction, Current Edition, Kentucky Transportation Cabinet/Department of Highways, Section 302 – Dense Graded Aggregate (DGA) and Crushed Stone Base (CSB) and Division 400 – Asphalt Pavements, shall apply unless otherwise noted.

**1.2 SUMMARY**

- A. This Section specifies construction of asphalt pavement, including aggregate base course, binder course, surface course, and tack and prime coats.

**1.3 SYSTEM DESCRIPTION**

- A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the Standard Specifications For Road and Bridge Construction, Current Edition, Kentucky Transportation Cabinet/Department of Highways.

**1.4 SUBMITTALS**

- A. Product Data: For each product specified. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: For each job mix proposed for the Work.
- C. Shop Drawings: Indicate pavement markings and defined parking spaces. Indicate dedicated handicapped spaces with international graphics symbol.

**1.5 QUALITY ASSURANCE**

- A. Where indicated, comply with the applicable provisions of the Kentucky Department of Highways, Standard Specification for Road and Bridge Construction (KY), current edition.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
  - 1. Prime and Tack Coats: Minimum surface temperature of 60 deg F (15.5 deg C).
  - 2. Asphalt Base Course: Minimum surface temperature of 40 deg F (4 deg C) and rising at time of placement.
  - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.5 deg C) at time of placement.

## 1.7 DEFINITIONS

- A. Department: Owner.

# PART 2 - PRODUCTS

## 2.1 AGGREGATE MATERIALS

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: Sound; angular crushed stone; crushed gravel; or properly cured, crushed blast-furnace slag; complying with ASTM D 692.
- C. Fine Aggregate: Sharp-edged natural sand or sand prepared from stone; gravel, properly cured blast-furnace slag, or combinations thereof; complying with ASTM D 1073.
  - 1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D 242.
- E. Crushed Stone Base (CSB)
  - 1. Aggregate for the Crushed Stone Base (CSB) shall conform to Section 805 of the Standard Specifications For Road and Bridge Construction, Current Edition, Kentucky Transportation Cabinet/Department of Highways.
  - 2. Crushed stone base shall conform to Section 302 of the Standard Specifications For Road and Bridge Construction, Current Edition, Kentucky Transportation Cabinet/Department of Highways.

## 2.2 ASPHALT MATERIALS

- A. General: Use locally available materials and gradations that exhibit a satisfactory record of previous installations.
- B. Course Aggregate: Sound, angular crushed stone, or crushed gravel, complying with KY Section 904.
- C. Fine Aggregate: Sharp-edged natural sand or sand prepared from stone, gravel, or combinations thereof, complying with KY Section 904.
- D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with KY Section 904.
- E. Asphalt Cement: Comply with applicable sections of KY Section 403.
- F. Prime Coat: Comply with applicable sections of KY Section 403.
- G. Tack Coat: Comply with applicable sections of KY Section 403.
- H. Bituminous Concrete Binder: Comply with KY Section 403.
- G. Bituminous Concrete Surface: Comply with KY Section 403.
- I. Asphalt Sealer: Provide Jennite AE by Neyra Industries, Inc., Cincinnati, OH or equal.

## 2.3 ASPHALT-AGGREGATE MIXTURE

- A. Hot-Mix Asphalt: Provide dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed according to procedures in AI's "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:
  - 1. Provide plant-mixed, hot-laid asphalt-aggregate mixture complying with KY 403 and as recommended by local paving authorities to suit project conditions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
- C. Notify Architect in writing of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

### 3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
  - 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
  - 1. Mix herbicide with prime coat when formulated by manufacturer for that purpose.
- C. Prime Coat: Apply uniformly over surface of compacted-aggregate base at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for 72 hours minimum.
  - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
  - 2. Protect primed substrate from damage until ready to receive paving.

### 3.3 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
  - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.

2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

### 3.4 JOINTS

- A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat.
  2. Offset longitudinal joints in successive courses a minimum of 6 inches (150 mm).
  3. Offset transverse joints in successive courses a minimum of 24 inches (600 mm).
  4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
  5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  6. Compact asphalt at joints to a density within 2 percent of specified course density.

### 3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and rerolling to required elevations.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
  2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.
- 3.6 INSTALLATION TOLERANCES
- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Base Course: Plus or minus 1/2 inch (13 mm).
  2. Surface Course: Plus 1/4 inch (6 mm), no minus.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
1. Base Course: 1/4 inch (6 mm).
  2. Surface Course: 1/8 inch (3 mm).
  3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).
- 3.7 PAYMENT
- A. For "Crushed Stone Base" payment shall be made at the contract unit price per ton. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item.

- B. For "Class II Asphalt Base 0.75D PG 64-22" payment shall be made at the contract unit price per ton. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item.
- C. For "Class II Asphalt Surface 0.38D PG 64-22" payment shall be made at the contract unit price per ton. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item.
- D. For "Bituminous Prime Coat" payment shall be made at the contract unit price per gallon. This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item.
- E. No separate measurement or payment shall be made for bituminous tack coat as it will be considered incidental to the asphalt courses.
- F. Payment will be made under:
  - 1. CRUSHED STONE BASE .....per ton
  - 2. CLASS II ASPHALT BASE 0.75D PG 64-22 .....per ton
  - 3. CLASS II ASPHALT SURFACE 0.38D PG 64-22.....per ton
  - 4. BITUMINOUS PRIME COAT.....per gallon

END OF SECTION 321216

**SECTION 321313 - CONCRETE PAVING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes exterior portland cement concrete paving for the following:
  - 1. Exterior walkways, steps, and concrete paving.

**1.3 SUBMITTALS**

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.
- C. Design mixes for each class of concrete. Include revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor certifying that each material item complies with or exceeds requirements. Provide certification from admixture manufacturers that chloride content complies with requirements.

**1.4 QUALITY ASSURANCE**

- A. Concrete Standards: Comply with provisions of the following standards, except where more stringent requirements are indicated.
  - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
  - 2. ACI 318, "Building Code Requirements for Reinforced Concrete."
  - 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."



- B. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Concrete Testing Service: Contractor shall schedule and pay a qualified independent testing agency to perform materials evaluation tests and to design concrete mixes.

## PART 2 - PRODUCTS

### 2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
- B. Form Release Agent: Provide commercial formulation form-release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

### 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars and Tie Bars: ASTM A 615, Grade 60, deformed.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 775 with ASTM A 615, Grade 60 deformed steel bars.
- C. Plain, Cold-Drawn Steel Wire: ASTM A 82.
- D. Welded Steel Wire Fabric: ASTM A 185.
  - 1. Furnish in flat sheets, not rolls, unless otherwise acceptable to Architect.
- E. Deformed-Steel Welded Wire Fabric: ASTM A 497.
- F. Fabricated Bar Mats: Welded or clip-assembled steel bar mats, ASTM A 184. Use ASTM A 615, Grade 60 steel bars, unless otherwise indicated.
- G. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.
- H. Hook Bolts: ASTM A 307, Grade A bolts, internally and externally threaded. Design hook bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

- I. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications.

## 2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
  1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.
- B. Fly Ash: ASTM C 618, Type F., Minimum content 4%.
- C. Normal-Weight Aggregates: ASTM C 33, Class 4, and as follows. Provide aggregates from a single source.
  1. Maximum Aggregate Size: 1-1/2 inches.
  2. Do not use fine or coarse aggregates that contain substances that cause spalling.
  3. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
- D. Water: Potable.

## 2.4 ADMIXTURES

- A. Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- B. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.
- E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C 494, Type B.
  1. For use when ambient air temperature greater than 90 deg. F
  2. For use in exposed aggregate areas.

## 2.5 CURING AND HARDENING MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- B. Clear Solvent-Borne Liquid Membrane-Forming Curing Compound: ASTM C 309, Type I, Class A or B, wax free.
- C. Water Repellent: 40% Silane solution
  - 1. Provide Water Repellent by Chemtrete or equal.
  - 2. Apply to new concrete after 28 day curing period.

## 2.6 CONCRETE MIX

- A. Prepare design mixes for each type and strength of normal-weight concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use a qualified independent testing agency for preparing and reporting proposed mix designs.
  - 1. Do not use the Owner's field quality-control testing agency as the independent testing agency.
  - 2. Limit use of fly ash to 25 percent of cement content by weight.
- B. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with the following properties:
  - 1. Compressive Strength (28-Day): 4000 psi.
  - 2. Maximum Water-Cement Ratio at Point of Placement: 0.45.
  - 3. Slump Limit at Point of Placement: 4 inches.
    - a. Slump limit for concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-4-inch slump concrete.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows with a tolerance of plus or minus 1-1/2 percent:
  - 1. Air Content: 6.0 percent for 1-inch maximum aggregate
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

## PART 3 - EXECUTION

### 3.1 SURFACE PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

### 3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for paving to required lines, grades, and elevations. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork and screeds for grade and alignment to following tolerances:
  - 1. Top of Forms: Not more than 1/8 inch in 10 feet.
  - 2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

### 3.3 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.

### 3.4 JOINTS

- A. General: Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline, unless indicated otherwise.
- B. Contraction Joints: Provide weakened-plane contraction joints, sectioning concrete into areas as shown on Drawings. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness, as follows:
  - 1. Tooled Joints: Form contraction joints in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool.
- C. Expansion Joints : Unless otherwise indicated on the drawings, depending upon the width of the concrete area, the contractor shall create expansion joints using zip strips in conjunction with non-asphalt pre-molded expansion

material at intervals shown on drawings. After the concrete has cured sufficiently, the joints shall be cleaned so that a clean separation is formed between the slabs or other new concrete elements. The joint shall then be sealed with urethane caulking. An expansion joint shall be constructed where new sidewalks, curbs, gutters, or other new concrete element is being constructed and abuts any rigid structure or fixture such as curbs, columns, castings, building, light standards, etc. Dense foam shall be used for forming expansion joints for radii.

- D. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.

### 3.5 CONCRETE PLACEMENT

- A. Comply with requirements and with ACI 304R for measuring, mixing, transporting, and placing concrete.
  - 1. When concrete placing is interrupted for more than 1/2 hour, place a construction joint.

### 3.6 CONCRETE FINISHING

- A. Float Finish: Begin floating when bleed water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Finish surfaces to true planes within a tolerance of 1/4 inch in 10 feet as determined by a 10-foot-long straightedge placed anywhere on the surface in any direction. Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular texture.
  - 1. Medium Broom Finish: Draw a medium bristle broom across concrete surface perpendicular to line of traffic to provide a uniform medium texture finish.
- B. Final Tooling: Tool edges of paving, gutters, curbs, and joints formed in fresh concrete with a jointing tool to the following radius. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
  - 1. Radius: 3/8 inch.

### 3.7 CONCRETE PROTECTION, CURING, AND WATER PROOFING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of

ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.

- B. Evaporation Control: In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before floating.
- C. Curing Methods: Cure concrete by curing compound as follows:
  - 1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
- D. Waterproofing: Apply waterproofing Silane solution after 28 day curing period. Thoroughly clean concrete before applying waterproofing agent. Apply according to manufacturer's recommendations.

### 3.8 FIELD QUALITY CONTROL TESTING

- A. Employ and schedule a qualified independent testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement as follows:
  - 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
    - a. Slump: ASTM C 143; one test at point of placement for each compressive-strength test but no less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
    - b. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. Test one specimen at 7 days, test two specimens at 28 days, and retain one specimen in reserve for later testing if required.
  - 2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
  - 3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.
  - 4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and

provide corrective procedures for protecting and curing the in-place concrete.

5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. Test results will be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing.

### 3.9 REPAIRS AND PROTECTION

- A. Protect concrete from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- B. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

**END OF SECTION 321313**

**SECTION 329299 – TURF AND GRASSES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Lawns (sod and seed).
  - 2. Topsoil and soil amendments.

**1.3 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Qualification data for firms and persons (if requested) to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- C. Submit verification data on sod and seed type.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.
  - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.

**1.5 PROJECT CONDITIONS**

- A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting. WHEN INSTALLER BEGINS PLANTING, HE ACCEPTS THE CONDITION OF THE



SUBSTRATE AND CERTIFIES, BY HIS BEGINNING THE WORK, THAT CONDITIONS ARE NOT DETRIMENTAL TO THE HEALTH AND LONG-TERM GROWTH OF THE PLANT MATERIAL BEING INSTALLED.

#### 1.6 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant the following living planting materials for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.
  - 1. Trees.
- C. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.
- D. Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
- E. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

#### 1.7 LAWN MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
  - 1. Seeded Lawns: 60 days after date of Substantial Completion.
    - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
  - 2. Sodded Lawns: 30 days after date of Substantial Completion.
- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.

- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches (100 mm).
  - 1. Water lawn at the minimum rate of 1 inch (25 mm) per week.
- D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.
- E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.
  - 1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of lawn area.

## PART 2 - PRODUCTS

### 2.1 GRASS MATERIALS

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
  - 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated:
    - 2. Provide "Finelawn Fescue"
- B. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture of the following turfgrass species, strongly rooted, and capable of vigorous growth and development when planted.
  - 1. Species: Provide "Finelawn Fescue" sod.

### 2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when

necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.2 LAWN PLANTING PREPARATION

- A. Limit subgrade preparation to areas that will be planted in the immediate future.
- B. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.
- C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
  - 1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
  - 2. Allow for sod thickness in areas to be sodded.
- D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
  - 1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
  - 2. Till surface soil to a depth of at least 6 inches (150 mm). Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
  - 3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches (38 mm) in any dimension, and other objects that may interfere with planting or maintenance operations.

- F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

### 3.3 SEEDING NEW LAWNS

- A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- B. Sow seed at the following rates:
  - 1. Seeding Rate: 5 to 8 lb per 1000 sq. ft. (2.5 to 4 kg per 100 sq. m).
- C. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.
- D. Protect seeded slopes exceeding 1:4 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations.
- E. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
- F. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch (4.8 mm) thick and roll to a smooth surface.

### 3.4 SODDING NEW LAWNS

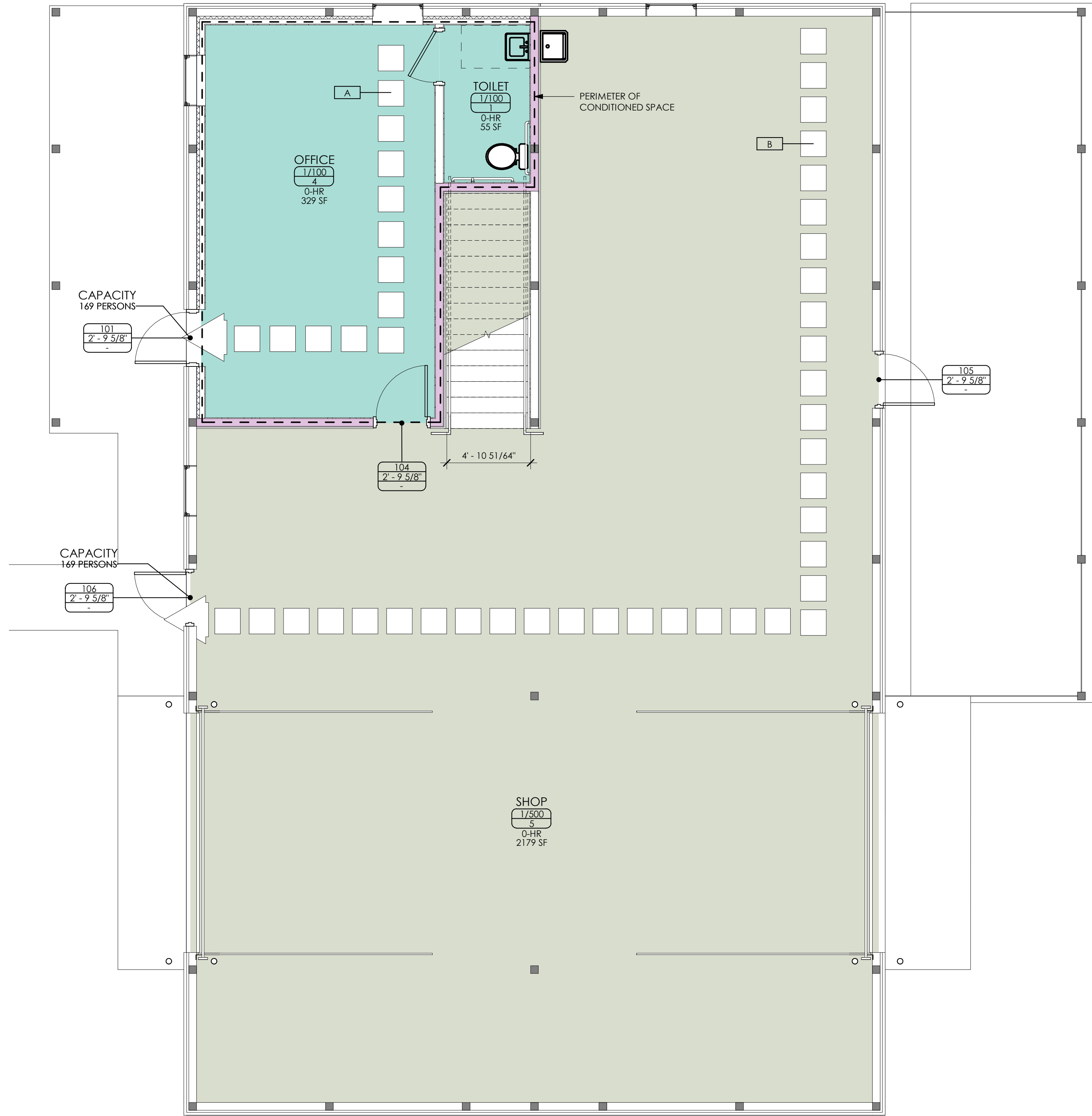
- A. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

- C. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below the sod.

END OF SECTION 329200







Occupancy Legend (IBC 1004.1.1)



## EGRESS ROOM SCHEDULE

Number	Name	Egress Occupancy Style	Egress Rating	Area	Occupant Allowance	Occupant / SF Ratio	Calculated Occupancy	Occupant Load	Egress Width - Other - S	Egress Width - Stairs - S
Level 1										
101	SHOP	Warehouse	0-HR	2179 SF	500 SF	1/500	4.357431	5	255/256"	1 129/256"
102	OFFICE	Business (gross)	0-HR	329 SF	100 SF	1/100	3.287342	4	51/64"	1 13/64"
103	TOILET	Business (gross)	0-HR	55 SF	100 SF	1/100	0.547655	1	51/256"	77/256"
Level 1: 3				2562 SF			8.192427	10	1 127/128"	3 1/128"
MEZZANINE LEVEL										
104	MEZZANINE	Warehouse		406 SF	500 SF	1/500	0.812344	1	51/256"	77/256"
MEZZANINE LEVEL: 1				406 SF			0.812344	1	51/256"	77/256"
4				2968 SF			9.004771	11	2 49/256"	3 79/256"

## CODE SUMMARY

### APPLICABLE CODES:

- 2018 KENTUCKY BUILDING CODE - FIRST EDITION - JUNE 2018 (KBC)
- BASED ON 2015 INTERNATIONAL BUILDING CODE (IBC)
- 2015 INTERNATIONAL EXISTING BUILDING CODE
- 2017 KENTUCKY STATE PLUMBING LAW
- ANSI A117.1 - 2009 ACCESSIBILITY GUIDELINES

### OVERVIEW:

THE NEW SHOP BUILDING IS PRIMARILY INTENDED TO HOUSE MATERIALS AND EQUIPMENT USED FOR GROUNDS MAINTENANCE AT THE CAMP. THE BUILDING IS PRIMARILY S-1 OCCUPANCY WITH A SMALL OFFICE INTENDED FOR ONE EMPLOYEE IN THE NORTHWEST CORNER. THIS OFFICE WILL HAVE ITS OWN TOILET DUE TO ITS DISTANCE FROM OTHER BUILDINGS. THE NEW 2,560 SF BUILDING WILL HAVE AN OFFICE AREA OF 388 SF. THE AREA OF THE BUSINESS OCCUPANCY EXCEEDS THE 10% ALLOWABLE FOR AN ACCESSORY OCCUPANCY (338 SF/2,560 SF = 15.2%). THEREFORE THE BUILDING WILL BE TREATED AS A SEPARATED MIXED-USE PROJECT.

THE BUILDING WILL NOT HAVE AN AUTOMATIC SPRINKLER SYSTEM PER KBC 903.3.1.1.

### CONSTRUCTION TYPE:

THE BUILDING WILL BE CONSTRUCTED AS TYPE V-B CONSTRUCTION USING A PRE-ENGINEERED POLE BUILDING STRUCTURE WITH A METAL PANEL SKIN OVER A CONCRETE SLAB-ON-GRADE.

### HEIGHT AND AREA:

ALLOWABLE HEIGHT FOR BOTH B AND S OCCUPANCIES IN V-B CONSTRUCTION IS 40'-0". THE B OCCUPANCY ALLOWS FOR 2 STORIES BUT THE S OCCUPANCY IS LIMITED TO 1 STORY. THE ACTUAL HEIGHT OF THE BUILDING IS 1 STORY / 22'-6".

PER KBC 508.4.2, THE SUM OF THE RATIOS OF ACTUAL TO ALLOWABLE AREAS IN THE BUILDING ARE LESS THAN 1.00 AS FOLLOWS:

OCCUPANCY	ACTUAL	ALLOWABLE	RATIO
STORAGE 1	2,172 SF	9,000 SF	.24
BUSINESS	388 SF	9,000 SF	.04
<b>TOTAL</b>	<b>2,560 SF</b>		<b>0.28</b>

### MEZZANINE:

THE MEZZANINE AREA IS 403 SF ABOVE THE OFFICE AREA. IT IS OPEN WITH THE EXCEPTION OF A 36" KNEE WALL SURROUNDING IT PER 505.2.3: OPENNESS. IT COMPLIES WITH KBC 505.2 - PROVIDING A MINIMUM CLEAR HEIGHT OF 7'-0" ABOVE ADN BELOW THE MEZZANINE FLOOR. THE AREA OF THE MEZZANINE IS 15.7% OF THE TOTAL FLOOR AREA (2,560 SF) WHICH IS LESS THAN THE 1/3 (33%) MAXIMUM ALLOWED BY KBC 505.2.1. THE MEZZANINE HAS A SINGLE MEANS OF EGRESS VIA A 4'-10" WIDE WOOD STAIR.

### REQUIRED SEPARATIONS FOR MIXED-USE:

#### STRUCTURAL FRAME (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR THE STRUCTURAL FRAME

#### BEARING WALLS (KBC TABLE 601):

EXTERIOR BEARING WALLS AND INTERIOR BEARING WALLS ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED CONSTRUCTION FOR V-B CONSTRUCTION.

#### FLOOR CONSTRUCTION (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR FLOORS

#### ROOF CONSTRUCTION (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR ROOFS

### SEPARATIONS:

NO FIRE RESISTANCE RATED SEPARATIONS ARE REQUIRED.

### SMOKE PARTITIONS:

SMOKE PARTITIONS PER KBC 710 - SEAL ALL JOINTS AND PENETRATIONS WITH APPROVED MATERIAL TO LIMIT FREE PASSAGE OF SMOKE - EXTEND TO UNDERSIDE OF CEILING CONSTRUCTED TO LIMIT THE TRANSFER OF SMOKE - APPROVED SEALING MATERIALS TO MAINTAIN THEIR INTEGRITY AT 400°F MIN.

### EXTERIOR WALLS (TABLE 602) AND MAXIMUM AREA OF EXTERIOR OPENINGS (TABLE 705.8):

BECAUSE THE SEPARATION DISTANCE IS GREATER THAN 25'-0" THERE IS NO REQUIRED RATING FOR AN EXTERIOR WALL OF TYPE V-B CONSTRUCTION FOR BUSINESS OR S-1 OCCUPANCIES. PER TABLE 705.8 UNPROTECTED OPENINGS IN NON-SPRINKLERED BUILDINGS MAY TOTAL 70% OF THE EXTERIOR WALL AREA. TOTAL AREA OF UNPROTECTED OPENINGS = 447 / 3328 SF OF WALL AREA = 1.3%

## CODE SUMMARY (CONT'D)

### MAXIMUM EXIT ACCESS TRAVEL DISTANCE (KBC 1017.2)

BOTH S-1 AND B OCCUPANCIES REQUIRE MAXIMUM OF 200'-0" EXIT ACCESS TRAVEL DISTANCE WITHOUT AN AUTOMATIC SPRINKLER SYSTEM. THE LONGEST TRAVEL DISTANCE IN THE BUILDING IS 70'-2". TRAVEL DISTANCES ARE SHOWN ON THE LIFE SAFETY PLAN AND THE EGRESS TRAVEL DISTANCES SCHEDULE ON SHEET A001 - LIFE SAFETY PLAN. MAXIMUM ALLOWABLE EXIT ACCESS TRAVEL DISTANCES ARE PER KBC TABLE 1017.2. ALL EXITS ARE UNDER THE MAXIMUM ALLOWED DISTANCE FROM THE MOST REMOTE LOCATIONS ON THE PLANS.

NOTE: THE EXIT ACCESS TRAVEL PATHS MODELED ON THE LIFE SAFETY PLAN REPRESENT THE LONGEST POSSIBLE EGRESS ROUTES FROM THE BUILDING. THESE PATHS ALSO ONLY END AT ACCESSIBLE EXITS. THERE ARE ADDITIONAL PATHS AVAILABLE AND ADDITIONAL NON-ACCESSIBLE EXITS FROM THE BUILDING.

THERE ARE (2) MAIN EXITS FROM THE BUILDING, EACH CONSISTING OF A 3'-0" DOOR. HOWEVER THE BUILDING QUALIFIES AS A SPACE WITH ONE EXIT PER TABLE 1006.2.1. FOR BOTH B AND S-1 OCCUPANCIES THE MAXIMUM TRAVEL DISTANCE IS 100'-0" AND THE CALCULATED OCCUPANT LOAD OF THE BUILDING IS 9 PERSONS - LESS THAN THE 49 AND 29 PERSONS ALLOWED FOR B AND S OCCUPANCIES, RESPECTIVELY. OCCUPANCY LOADS ARE CALCULATED ON THE EGRESS ROOM SCHEDULE ON SHEET A001.

### EXIT CONFIGURATION

THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING IS 75'-5". HOWEVER, THE BUILDING IS REQUIRED TO HAVE ONLY ONE EXIT AND THEREFORE DOES NOT NEED TO MEET THE REMOTENESS REQUIREMENTS.

### PLUMBING FIXTURES (815 KAR 20:191):

FOR ONE EMPLOYEE, THE BUILDING IS PERMITTED TO HAVE A SINGLE UNISEX TOILET.

### INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

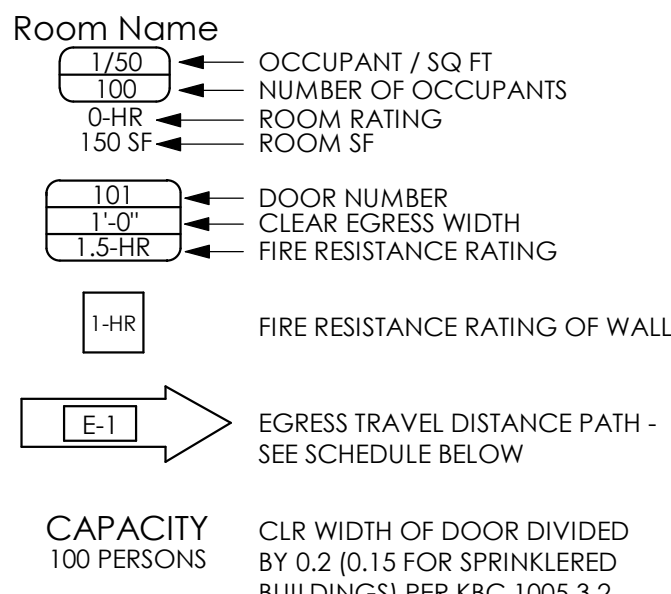
THE MAJORITY OF THE BUILDING IS UNCONDITIONED STORAGE SPACE. HOWEVER THE OFFICE ARE IS SERVED BY A THRU-WALL PTAC UNIT. THESE SPACES WILL BE SEPARATED FROM THE EXTERIOR AND THE UNCONDITIONED SPACES BY A THERMAL ENVELOPE CONFORMING TO THE IECC



A SHOP PLAN - LIFE SAFETY  
A001 SCALE: 1/4" = 1'-0"

## EGRESS TRAVEL DISTANCES (KBC 1017.2)

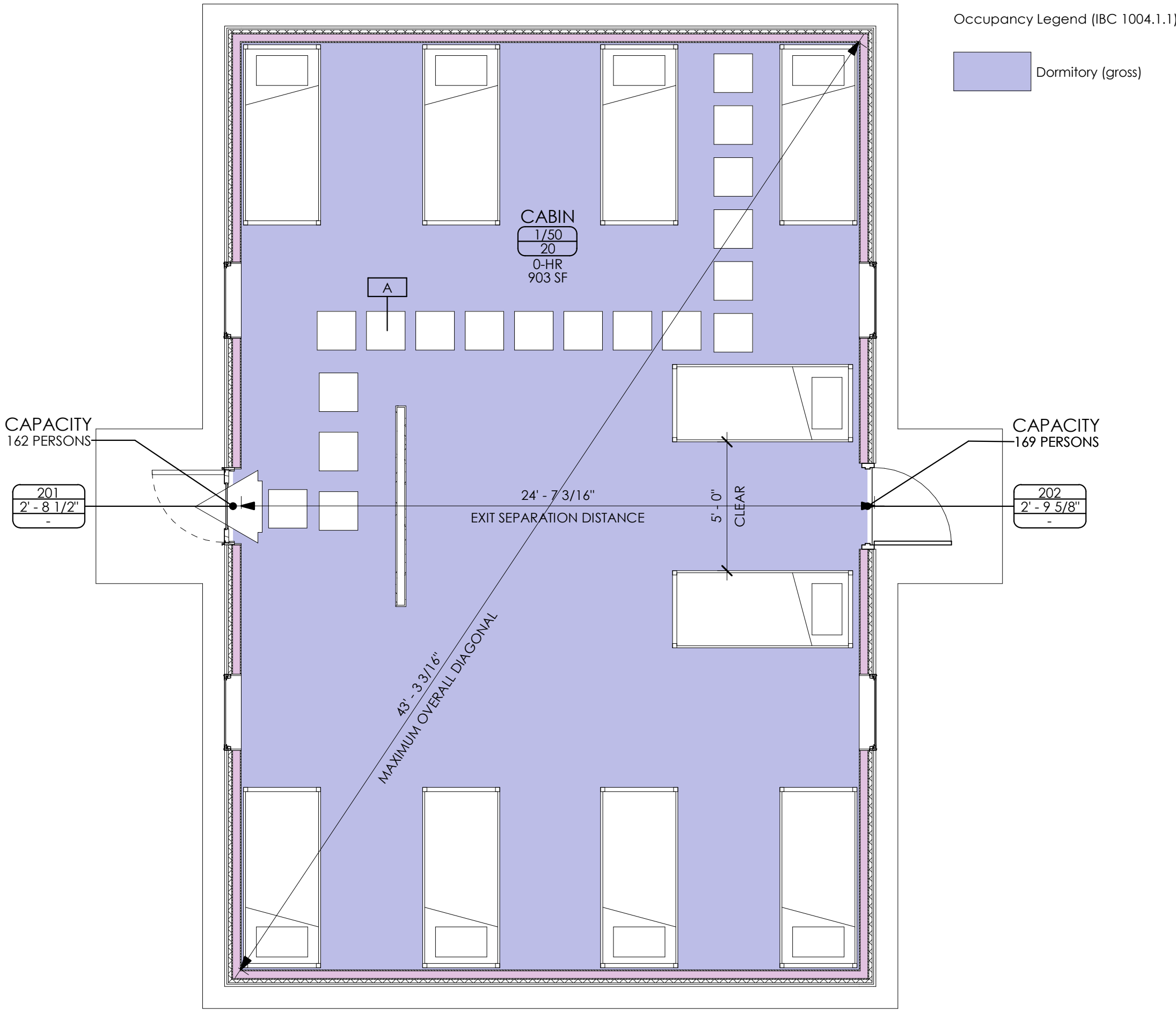
PATH	EGRESS DISTANCE	COMMENTS
A	26' - 11"	< 200'-0" FOR NON-SPRINKLERED BUSINESS (B) OCCUPANCY
B	70' - 2"	< 200'-0" FOR NON-SPRINKLERED STORAGE-1 (S-1) OCCUPANCY

## EGRESS PLAN LEGEND



	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION				
	A&E FILE NO.:	0000.00	LIFE SAFETY PLANS				
	DRAWING DATE:	05/11/2020	DRAWING NO.		A001		
	DRAWN BY:	KDP	ACCOUNT NO.				
	CHECKED BY:	SMW	540-C97Q-FF19-00		COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY		
	PHASE:	RTA	WHITE   POLLARD architects, pllc 561a WEST THIRD STREET LEXINGTON, KENTUCKY 40508 tel: 859.469.9177				
	RTA DATE:	11 MAY 2020					
			AS-BUILT DATE:		DECA LOG NO.		
					A1C-6911		
			REVISION HISTORY OF THIS DOCUMENT				
REVISIONS:			DATE:	REVISIONS:		DATE:	
1	2	3	4	5	6	7	8





A LIFE SAFETY PLAN  
A002  
SCALE: 1/4" = 1'-0"

_EGRESS ROOM SCHEDULE										
Number	Name	Egress Occupancy Style	Egress Rating	Area	Occupant Allowance	Occupant / SF Ratio	Calculated Occupancy	Occupant Load	Egress Width - Other - NS	Egress Width - Stairs - NS
FLOOR PLAN										
201	CABIN	Dormitory (gross)	0-HR	903 SF	50 SF	1/50	18.063342	20	4"	6"
FLOOR PLAN: 1				903 SF			18.063342	20	4"	6"
1				903 SF			18.063342	20	4"	6"

## CODE SUMMARY

### APPLICABLE CODES:

- 2018 KENTUCKY BUILDING CODE - FIRST EDITION - JUNE 2018 (KBC)
- BASED ON 2015 INTERNATIONAL BUILDING CODE (IBC)
- 2015 INTERNATIONAL EXISTING BUILDING CODE
- 2017 KENTUCKY STATE PLUMBING LAW
- ANSI A117.1 - 2009 ACCESSIBILITY GUIDELINES

### OVERVIEW:

THE NEW CABINS ARE INTENDED TO SLEEP 20 CAMPERS IN ONE ROOM. THE BUILDINGS ARE R-1 OCCUPANCY WITH AN AREA OF 864 SF EACH.

THE BUILDING WILL NOT HAVE AN AUTOMATIC SPRINKLER SYSTEM PER KBC 903.2.8.1 EXCEPTION #1 FOR GUESTROOMS WITH DOORS LEADING DIRECTLY TO THE EXTERIOR.

### CONSTRUCTION TYPE:

THE BUILDINGS WILL BE CONSTRUCTED AS TYPE V-B CONSTRUCTION - WOOD FRAMING WITH A METAL PANEL SKIN OVER A CONCRETE SLAB-ON-GRADE.

### HEIGHT AND AREA:

ALLOWABLE HEIGHT FOR R-1 OCCUPANCIES IN V-B CONSTRUCTION IS 40'-0". THE R-1 OCCUPANCY ALLOWS FOR 2 STORIES. THE ACTUAL HEIGHT OF THE BUILDING IS 1 STORY / 12'-6". MAXIMUM ALLOWABLE AREA FOR NON-SPRINKLERED, R-1 BUILDINGS OF TYPE V CONSTRUCTION IS 7,000 SF. ACTUAL AREA OF THE BUILDING IS 864 SF.

### REQUIRED FIRE RESISTANCE RATINGS:

#### STRUCTURAL FRAME (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR THE STRUCTURAL FRAME

#### BEARING WALLS (KBC TABLE 601):

EXTERIOR BEARING WALLS AND INTERIOR BEARING WALLS ARE NOT REQUIRED TO BE FIRE RESISTANCE RATED CONSTRUCTION FOR V-B CONSTRUCTION.

#### FLOOR CONSTRUCTION (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR FLOORS

#### ROOF CONSTRUCTION (KBC TABLE 601):

FOR V-B CONSTRUCTION NO FIRE RESISTANCE RATING IS REQUIRED FOR ROOFS

#### SEPARATIONS:

NO FIRE RESISTANCE RATED SEPARATIONS ARE REQUIRED.

### EXTERIOR WALLS (TABLE 602) AND MAXIMUM AREA OF EXTERIOR OPENINGS (TABLE 705.8):

BECAUSE THE SEPARATION DISTANCE IS GREATER THAN 10'-0" THERE IS NO REQUIRED RATING FOR AN EXTERIOR WALL OF TYPE V-B CONSTRUCTION FOR R-1 OCCUPANCIES. PER TABLE 705.8 UNPROTECTED OPENINGS IN NON-SPRINKLERED BUILDINGS MAY TOTAL 15% OF THE EXTERIOR WALL AREA. TOTAL AREA OF UNPROTECTED OPENINGS = 63 SF / 690 SF OF WALL AREA = 6.6%

## CODE SUMMARY (CONT'D)

### MAXIMUM EXIT ACCESS TRAVEL DISTANCE (KBC 1017.2)

R OCCUPANCIES REQUIRE MAXIMUM OF 200'-0" EXIT ACCESS TRAVEL DISTANCE WITHOUT AN AUTOMATIC SPRINKLER SYSTEM. THE LONGEST TRAVEL DISTANCE IN THE BUILDING IS 36'-1". TRAVEL DISTANCES ARE SHOWN ON THE LIFE SAFETY PLAN AND THE EGRESS TRAVEL DISTANCES SCHEDULE ON SHEET A002 - LIFE SAFETY PLAN. MAXIMUM ALLOWABLE EXIT ACCESS TRAVEL DISTANCES ARE PER KBC TABLE 1017.2. ALL EXITS ARE UNDER THE MAXIMUM ALLOWED DISTANCE FROM THE MOST REMOTE LOCATIONS ON THE PLANS.

THERE IS (1) MAIN EXITS FROM THE BUILDINGS CONSISTING OF A 3'-0" DOOR. A SECOND MEANS OF EGRESS FROM THE BUILDING IS A 3'-0" DOOR AT THE REAR OF THE BUILDING IS FOR EGRESS ONLY.

### EMERGENCY ESCAPE AND RESCUE OPENINGS (KBC 1030)

EMERGENCY ESCAPE AND RESCUE OPENINGS ARE NOT REQUIRED PER KBC 1030.1 EXCEPTION #2 BECAUSE THE SPACE HAS AN EXIT OPENING DIRECTLY TO A PUBLIC WAY.

### EXIT CONFIGURATION

THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE BUILDING IS 43'-3". EXIT SEPARATION 24' - 7 3/16" BETWEEN EXITS. EXIT SEPARATION IS GREATER THAN HALF THE DIAGONAL DIMENSION OF THE BUILDING.

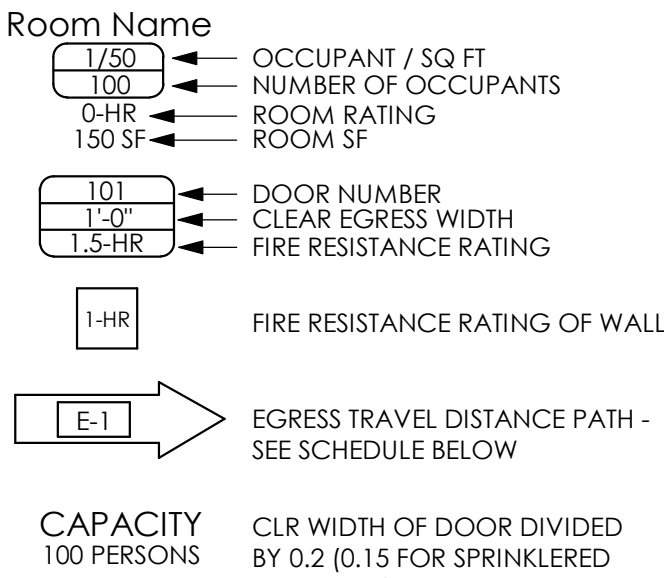
### PLUMBING FIXTURES (815 KAR 20:191):

NO PLUMBING FACILITIES ARE PROVIDED IN THE BUILDING.

### INTERNATIONAL ENERGY CONSERVATION CODE (IECC)

EGRESS TRAVEL DISTANCES (KBC 1017.2)		
PATH	EGRESS DISTANCE	COMMENTS
A	36' - 1"	

## EGRESS PLAN LEGEND



DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
A&E FILE NO.:	0000.00	LIFE SAFETY PLAN - CABINS	
DRAWING DATE:	05/11/2020	DRAWING NO. A002	
DRAWN BY:	KDP	ACCOUNT NO. 540-C97Q-FF19-00	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY
CHECKED BY:	SMW	AS-BUILT DATE:	
PHASE:	RTA	DECA LOG NO. A1C-6912	
RTA DATE:	11 MAY 2020	REVISION HISTORY OF THIS DOCUMENT	
WARNING OF PARTIAL SET REVIEW		DATE:	
General contractors and subcontractors bidding on work elements shown on this single sheet are hereby required to review the full set of construction drawings, the Specifications Manual and addenda (if issued) prior to submission of a bid. Submission of bid that serve as certification by all contractors of their comprehensive review of the complete Construction Documents Set listed above. Failure to review all Contract Documents, regardless of reason, shall not be reason for adjustment of the contract amount.		REVISIONS:	
		DATE:	DATE:
		2	2
		3	3
		4	4



COMMONWEALTH OF KENTUCKY  
FINANCE AND ADMINISTRATION CABINET  
DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES  
DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION  
BUSH BUILDING — 403 WAPPING STREET  
FRANKFORT, KENTUCKY 40601

CONTROL POINT DATA TABLE				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP #100	3806539.120	4717506.690	701.25'	P.K. NAIL WITH PLASTIC WASHER
CP #101	3806536.080	4717683.180	703.41'	1/2" REBAR (SET) — RED CAP
CP #102	3806390.650	4717620.760	700.29'	1/2" REBAR (SET) — RED CAP
CP #187	3806005.380	4717326.840	704.27'	1/2" REBAR (SET) — RED CAP
CP #188	3805870.970	4717328.240	699.70'	1/2" REBAR (SET) — RED CAP
CP #189	3805862.930	4717397.020	693.94'	1/2" REBAR (SET) — RED CAP

TOPOGRAPHIC SURVEY  
CONDITIONS SHOWN REPRESENT THE SITE ON DECEMBER 5, 2019.  
ARCHITECT RESPONSIBLE TO CHECK GRADES DURING "SITE VISIT".  
NO GUARANTEE SHALL BE MADE FOR ANY DISCREPANCIES THAT MAY  
HAVE TAKEN PLACE BETWEEN TIME OF TOPO AND TIME OF DESIGN.

#### GENERAL NOTES

- THE ELEVATIONS SHOWN ARE BASED ON NAVD (88) DATUM.
- THE HORIZONTAL COORDINATES SHOWN HEREON ARE BASED ON NAD (83) HORIZONTAL DATUM, KENTUCKY NORTH ZONE (1601), WGS 84 ELLIPSOID, WITH GEOD MODEL G2012BU7 (1).
- A RTK-GPS UNIT WAS USED TO DETERMINE GRID NORTH AND OBTAIN DATA FOR THIS TOPOGRAPHIC SURVEY.
- A SOKKIA GRX3 (DUAL FREQUENCY) RECEIVER UTILIZING REAL TIME VRS CORRECTIONS FROM THE KYDOT CORS NETWORK WAS EMPLOYED.
- THIS SITE IS NOT LOCATED IN THE 100 YEAR FLOOD HAZARD AREA AS SHOWN ON FIRM MAP No. 21027C0215CC TO THE BEST OF MY KNOWLEDGE AND BELIEF. FIRM MAP DATE: 08-04-2018.

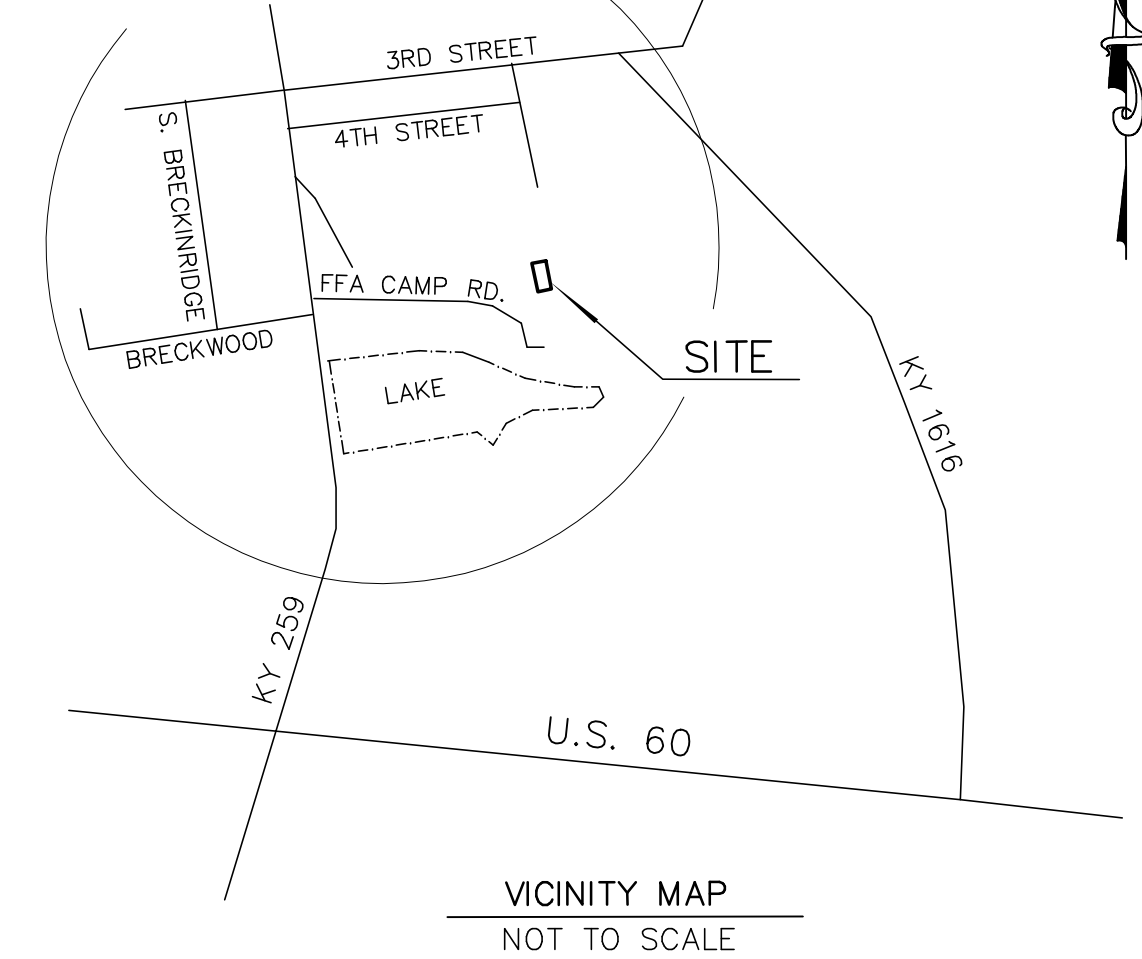
#### DRAWING REFERENCE BEARING

THE REFERENCE BEARING FOR THIS DRAWING IS THE NORTHERN LINE AS SHOWN ON SHEET C1-1 & C2-1 OF FFA LEADERSHIP TRAINING FACILITY DATED 4/16/93 BY PECK-FLANNERY-GREAM-WARREN ARCHITECTS.

BASE LINE ESTABLISHED 12/5/15 BETWEEN CP #100 & CP #101  
THIS BEARING IS S89°00'47"E.

\*ARCHITECT PLANS (WITH SITE) SHOWING BOUNDARY WERE PROVIDED BY DECA FOR PURPOSE OF THIS TOPOGRAPHIC SURVEY (SHEET C1-1).  
NO DEED WORK WAS PERFORMED AS PART OF THIS TOPOGRAPHIC SURVEY.

#### HARDINSBURG, KY



VICINITY MAP  
NOT TO SCALE

#### PROPOSED MAINTENANCE BUILDING CORNER COORDINATES (40' X 60' WITH SUGGESTED F.F.E. = 704.5')

CORNER	NORTH	EAST
N	3806520.711	4717631.446
E	3806514.974	4717671.032
S	3806455.594	4717662.427
W	3806461.331	4717622.840

#### PROPOSED 40'-0" X 60'-0" MAINTENANCE FACILITY

SUGGESTED FINISHED FLOOR ELEVATION — 704.6'  
(SUGGESTED PAVEMENT DESIGN: FILTER FABRIC & 6" DGA + 4" ASPHALT)

#### LEGEND

CP #100	BOUNDARY (PROVIDED SITE PLAN)
TEMPORARY BENCHMARK	CONTROL POINTS (SEE TABLE)
EXISTING CONTOUR	TEMPORARY BENCHMARK
EXISTING UTILITY POLE	EXISTING CONTOUR
EXISTING OVERHEAD UTILITIES LINE	EXISTING UTILITY POLE
EXISTING WATER VALVE	EXISTING OVERHEAD UTILITIES LINE
EXISTING WATER METER	EXISTING WATER VALVE
EX. WOOD & WOVEN WIRE FENCE	EXISTING WATER METER
EXISTING SPOT ELEVATION	EX. WOOD & WOVEN WIRE FENCE
EXISTING SEWER MANHOLE	EXISTING SPOT ELEVATION
EXISTING FIRE HYDRANT	EXISTING SEWER MANHOLE
EXISTING TELECOM. PEDESTAL	EXISTING FIRE HYDRANT
EXISTING POLE ANCHOR	EXISTING TELECOM. PEDESTAL
EXISTING WATER LINE	EXISTING POLE ANCHOR
BROKEN LINES (NOT TO SCALE)	EXISTING WATER LINE
EXISTING SANITARY SEWER	BROKEN LINES (NOT TO SCALE)
EXISTING SEWER CLEAN OUT	EXISTING SANITARY SEWER
EXISTING STONE RIP-RAP	EXISTING SEWER CLEAN OUT
EXISTING FLAG POLE	EXISTING STONE RIP-RAP
EXISTING LIGHT POLE	EXISTING FLAG POLE
EXISTING CA CL PUMP BASE & DISPENSER	EXISTING LIGHT POLE
EXISTING STEEL W BEAM GUARDRAIL	EXISTING CA CL PUMP BASE & DISPENSER
CENTER LINE (AS CONSTRUCTED)	EXISTING STEEL W BEAM GUARDRAIL
EXISTING GAS LINE (APPROX. LOCATION)	CENTER LINE (AS CONSTRUCTED)
EXISTING NATURAL GAS VALVE	EXISTING GAS LINE (APPROX. LOCATION)

#### TREE TABLE

LOCATION	SIZE	TYPE
1	30"	OAK
2	12"	HICKORY
3	12"	HICKORY
4	18"	ELM
5	24"	OAK
6	24"	STUMP
7	18"	OAK
8	80"	OAK
9	6" CLUMP	BIRCH
10	12"	HICKORY
11	24"	WALNUT
12	6"	CHERRY
13	24" CLUMP	CHERRY

#### BEFORE YOU DIG

ALL UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE.  
PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL CONTACT THE  
UTILITY PROTECTION CENTER FOR THE ACCURATE LOCATION  
OF THE UNDERGROUND UTILITIES. THE CONTRACTOR IS REQUIRED  
TO GIVE AT LEAST 48 HOURS PRIOR NOTICE OF EXCAVATION  
WORK. THE UNDERGROUND PROTECTION CENTER CAN BE REACHED  
BY CALLING 1-800-752-6007 OR 811.



#### EXCEPTIONS TO DRAWING

THIS DRAWING IS SUBJECT TO ALL RIGHTS OF WAY, EASEMENTS,  
CONVEYANCES AND RESTRICTIONS THAT A TITLE EXAMINATION  
WOULD REVEAL. NO TITLE REPORT WAS PROVIDED BY OWNER.  
THIS IS NOT A BOUNDARY SURVEY.  
THIS DRAWING NOT FOR THE TRANSFER OF PROPERTY.  
THIS DRAWING NOT TO BE USED TO CONSTRUCT FENCES.  
THE DRAWING SHOWN HEREON IS SUBJECT TO ANY INACCURACIES  
THAT A BOUNDARY SURVEY WOULD REVEAL.

#### SITE CONTACT PERSON

DAVID SMILEY  
FFA SITE FOREMAN  
HARDINSBURG  
C-(270) 302-3049

#### SITE GEOGRAPHIC COORDINATES

LATITUDE: 37°46'30"  
LONGITUDE: -86°27'16"

#### MAINTENANCE FACILITY LOCATION

111 FFA CAMP ROAD  
HARDINSBURG, KENTUCKY 40143

#### GOVERNOR — STATE OF KENTUCKY

ANDY BESHEAR

#### SECRETARY — FINANCE CABINET

HOLLY M. JOHNSON

#### PROJECT CONTACTS

COMPANY	CONTACT	NUMBER
MADE COUNTY RECC	NO CONTACT	270-756-2213
HARDINSBURG MUNICIPAL UTILITY	NO CONTACT	270-756-2213

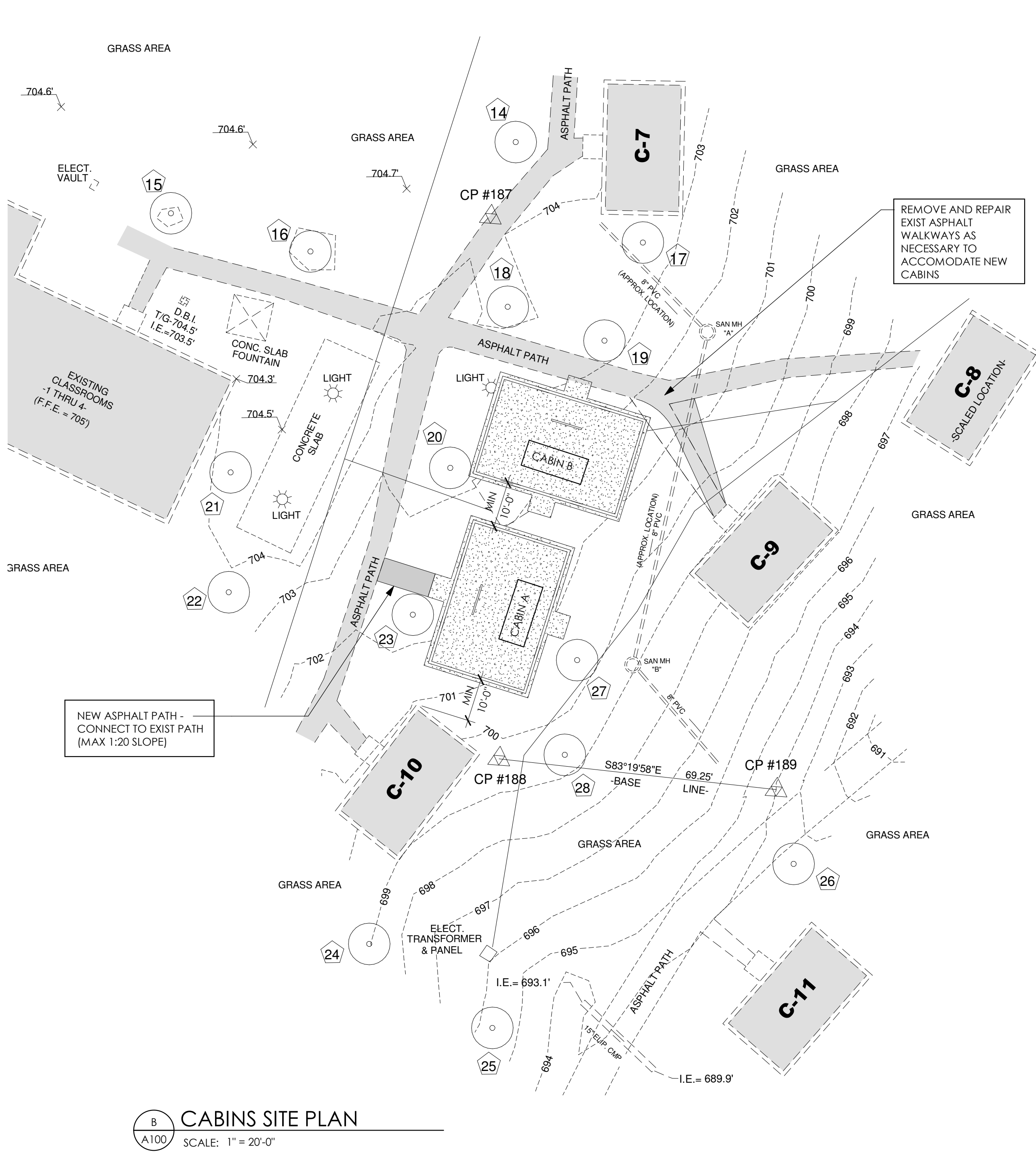
	DRAWING INFORMATION		FUTURE FARMERS OF AMERICA LEADERSHIP TRAINING FACILITY PROPOSED MAINTENANCE SHOP		DRAWING NO.  1 OF 1
	A&E FILE NO.				
	DRAWING DATE	12/10/19	TOPOGRAPHIC SITE SURVEY		
	DRAWN BY	c.t.s.	ACCOUNT NO.	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	AS BUILT DATE
CHECKED BY	M.A.T.	540-C970		DECA LOG #	
PHASE	- A -	FF19-00		A1C-6913	
RTA DATE					
REVISION HISTORY OF THIS DRAWING					
DESCRIPTION OF REVISIONS		DATE	DESCRIPTION OF REVISIONS		DATE
1	PHASE "A" BUSH BUILDING	12/12/19	5		
2	BUILDING LOCATION REVISED	12/16/19	6		
3	PROPOSED 1" WATER LINE SERVICE	02/25/20	7		
4			8		

C:\JOBS\2019\DECA-FFA-HARDINSBURG-MAINTENANCE-BUILDING.dwg


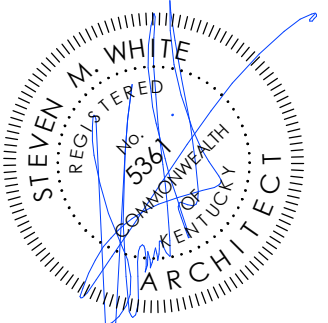
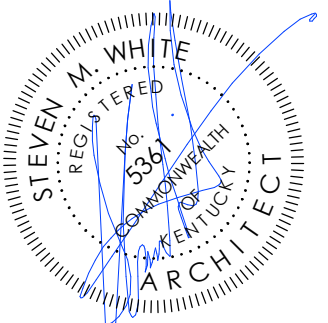




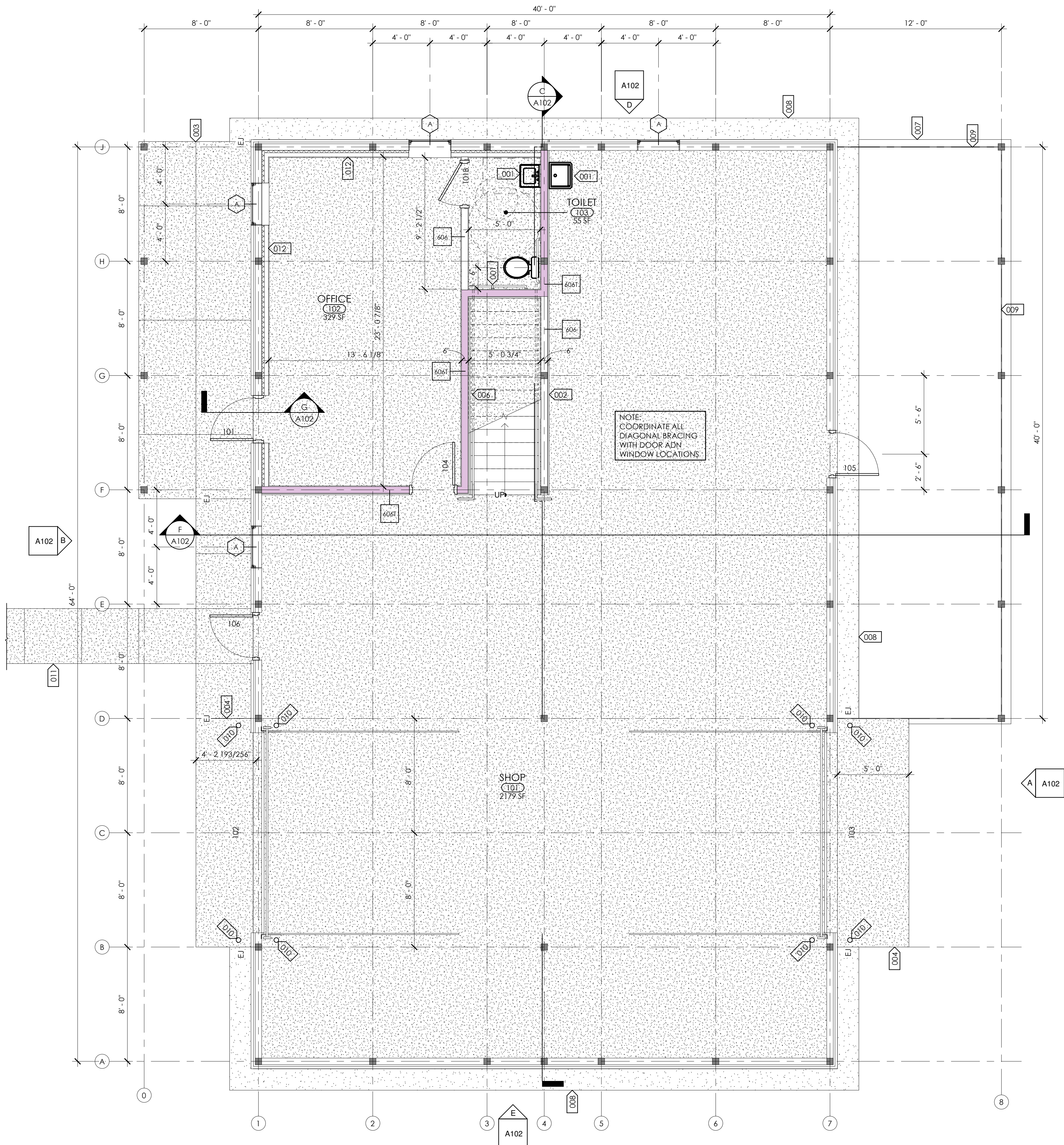
**A SITE PLAN**  
SCALE: 1" = 40'-0"



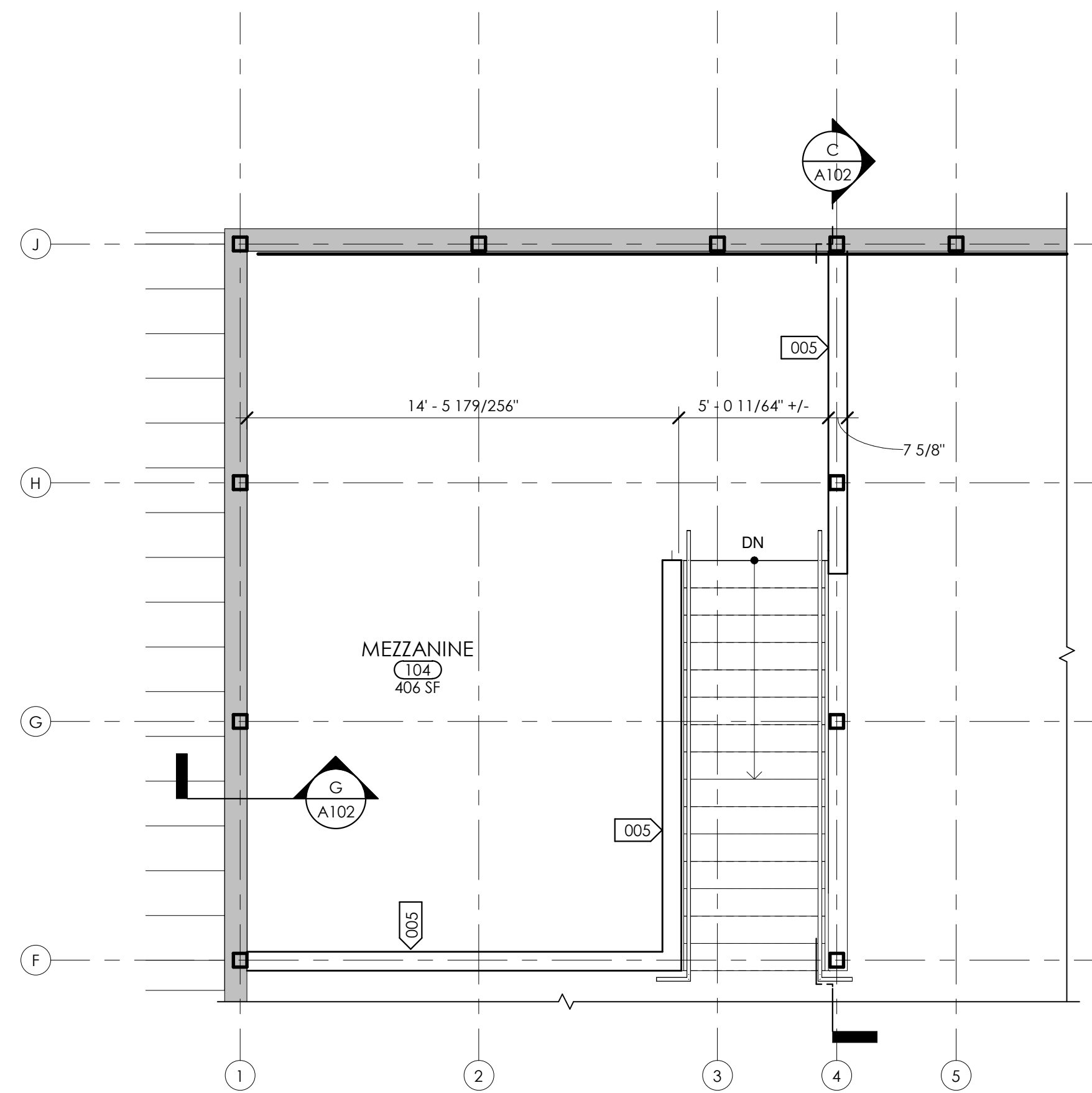
**B CABINS SITE PLAN**  
SCALE: 1" = 20'-0"

 	<b>DRAWING INFORMATION</b>		<b>FFA CABIN, SHOP &amp; MISC. CONSTRUCTION</b>	
	A&E FILE NO.:	0000.00	<b>SITE PLAN</b>	
	DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
	DRAWN BY:	Author	540-C97Q-FF19-00	<b>A100</b>
	CHECKED BY:	Checker	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
	PHASE:	RTA	<b>WHITE   POLLARD</b> architects, pllc 561a WEST THIRD STREET LEXINGTON, KENTUCKY 40508 tel: 859.469.9177	
	RTA DATE:	11 MAY 2020	AS-BUILT DATE:	
	REVISIONS HISTORY OF THIS DOCUMENT		DECA LOG NO. <b>A1C-6914</b>	
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**SHOP PLAN**  
SCALE: 1/4" = 1'-0"



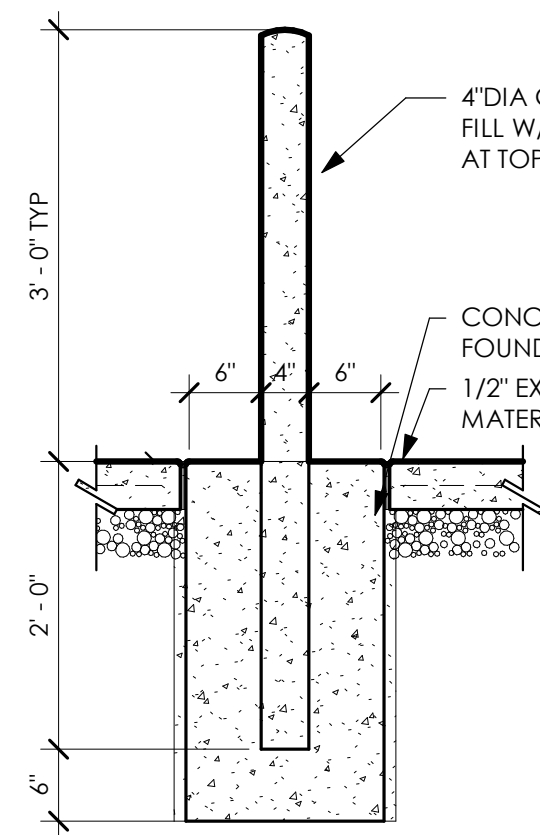
**MEZZANINE LEVEL**  
SCALE: 1/4" = 1'-0"

## FLOOR PLAN LEGEND

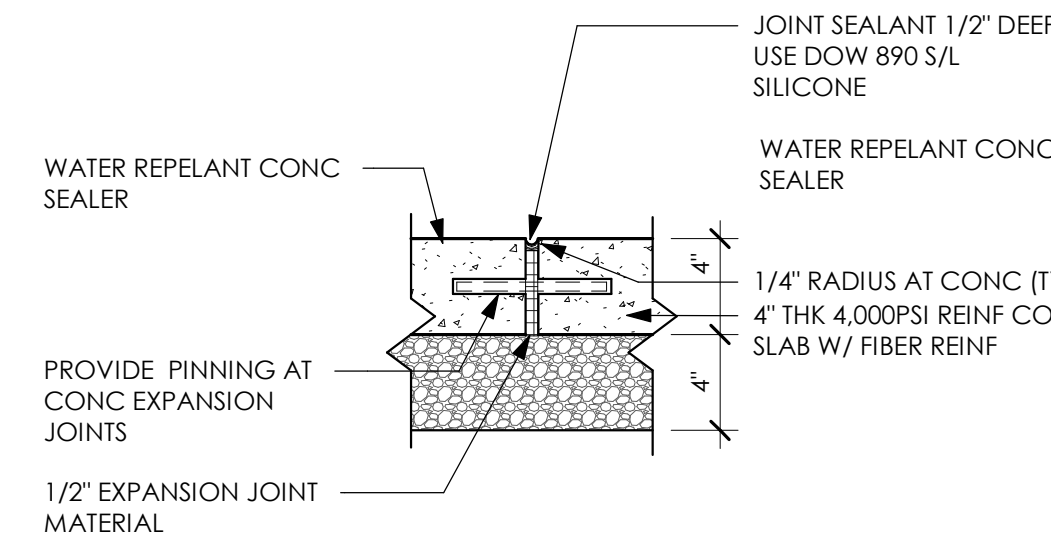
Name	
(101) 150 SF	ROOM NUMBER ROOM SF (WHERE APPLICABLE)
(000)	NOTE - SEE NOTE SCHEDULE EACH SHEET
101	DOOR TAG - SEE DOOR SCHEDULE
(AA)	WINDOW / GLAZING TAG
A	WALL TYPE TAG - SEE WALL TYPES SHEET
(CONCRETE SLAB)	CONCRETE SLAB - REFER TO FINISH SCHEDULE
(0)	STRUCTURAL GRID TAG
DS	DOWNSPOUT LOCATION
DF	DRINKING FOUNTAIN LOCATION - SEE PLUMB
FD	FLOOR DRAIN - SEE PLUMB
HB	HOSE BID LOCATION - REFER TO PLUMB
NIC	ELEMENT NOT IN CONTRACT (BY OTHERS)
(TI)	OWNER SUPPLIED EQUIPMENT TAG
FE-0	FIRE EXTINGUISHER TAG - SEE SCHEDULE ON LIFE SAFETY PLAN

## PLAN NOTES

NOTE #	DESCRIPTION
001	PROVIDE NECESSARY BLKG AT WALL MTD ELEMENTS
002	EXTEND WALL TO MIN 42" ABOVE STAIR NOSINGS TO FORM GUARD RAIL
003	4" THK CONCRETE PORCH SLAB
004	6" THK CONCRETE APRON
005	EXTEND WALL TO MIN 42" ABOVE MEZZANINE FLOOR
006	PROVIDE 1 1/2" DIA WALL MTD T.S. HANDRAILS AT EA SIDE OF STAIR
007	4" THK GRAVEL STORAGE AREA
008	4" THK CONC MOW STRIP AT PERIMETER OF BLDG - PROVIDE EXP JOINT AT BLDG SLAB
009	CHAIN LINK FENCE BETWEEN SUPPORTS (NIC BY OWNER) TYP
010	4" DIA BOLLARD - 3'-0" TALL - SEE DETAIL C/A101
011	4" THK CONC SIDEWALK ON 4" MIN GRAVEL BASE - EXTEND TO EXIST PARKING LOT
012	INSTALL 2x4 WD STUDS AT 24" O.C. W/ 5/8" GYP BD OVER 2" RIGID INSUL AT INSIDE OF POLE BUILDING STRUCTURE - R-13 BATTS TYP

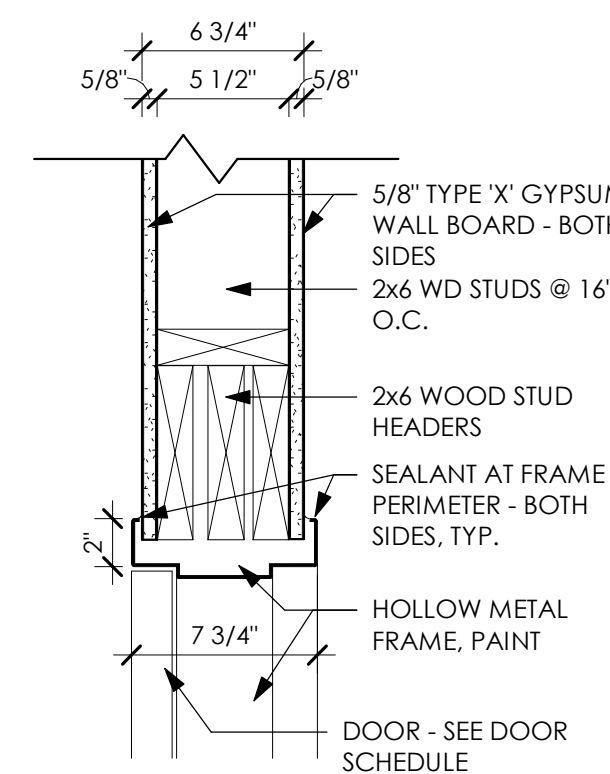


**BOLLARD**  
SCALE: 3/4" = 1'-0"



**EXPANSION JOINT**  
SCALE: 1 1/2" = 1'-0"

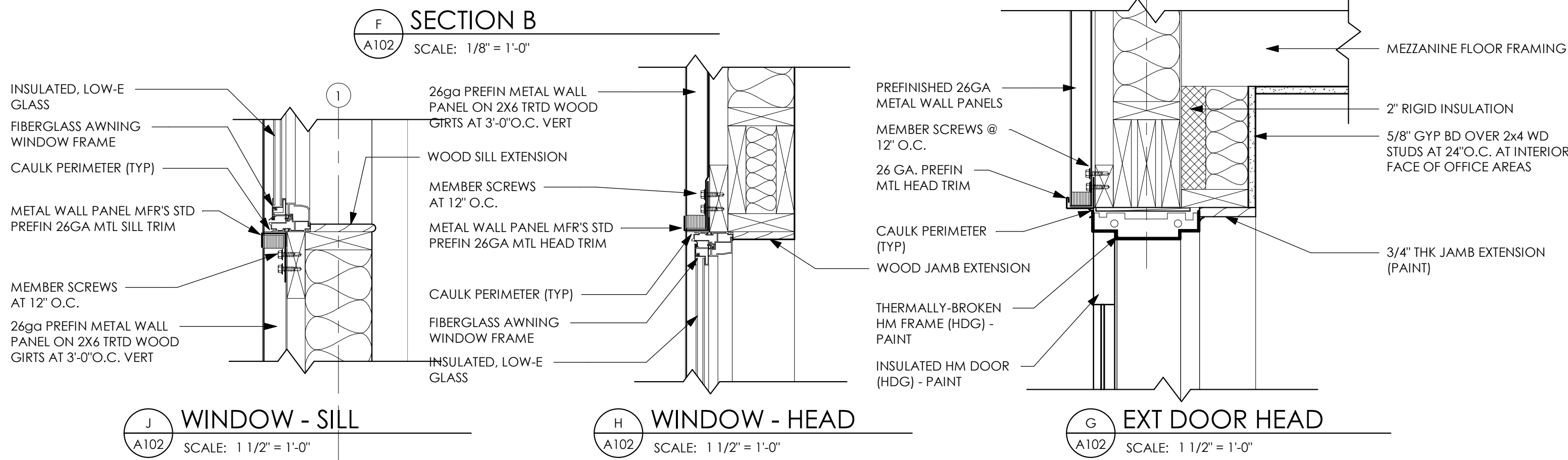
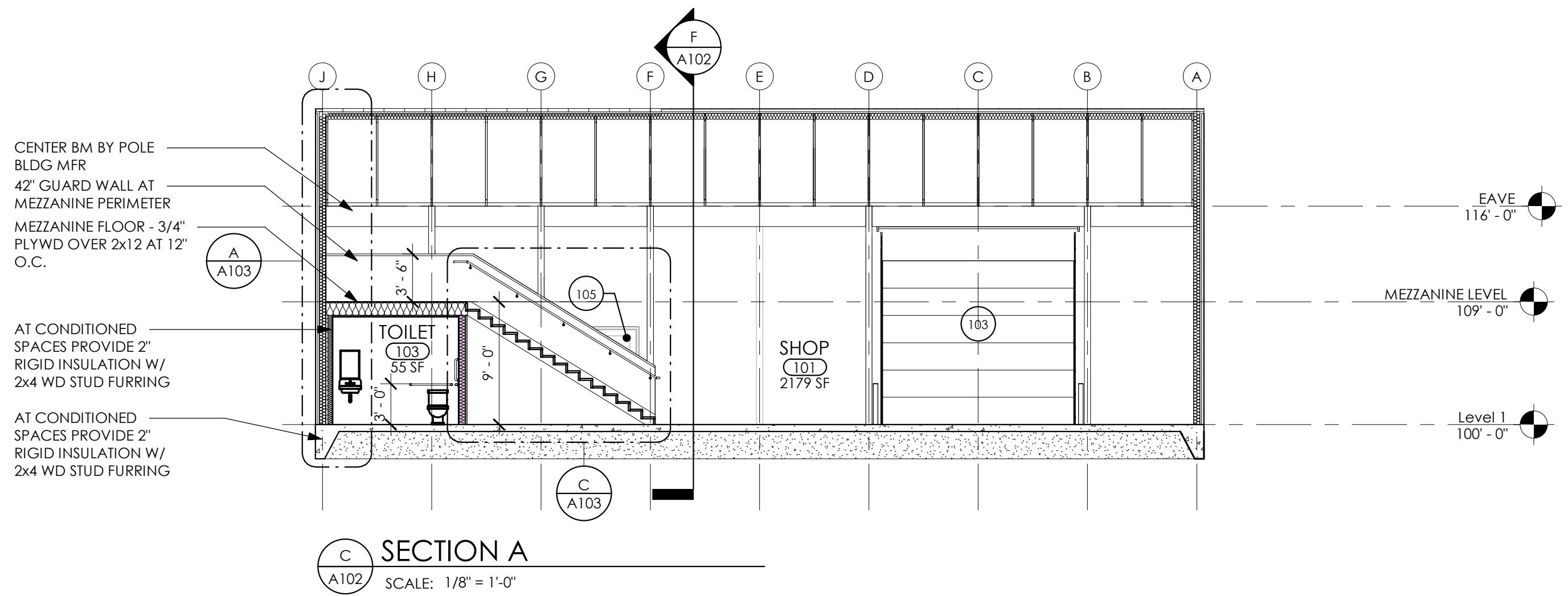
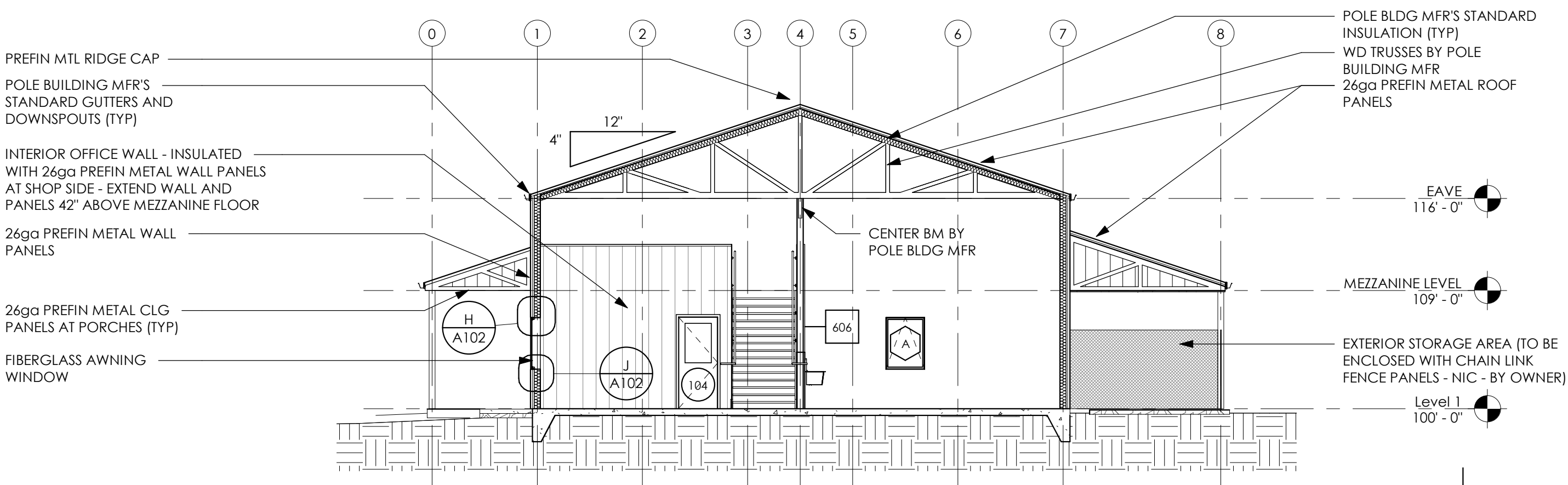
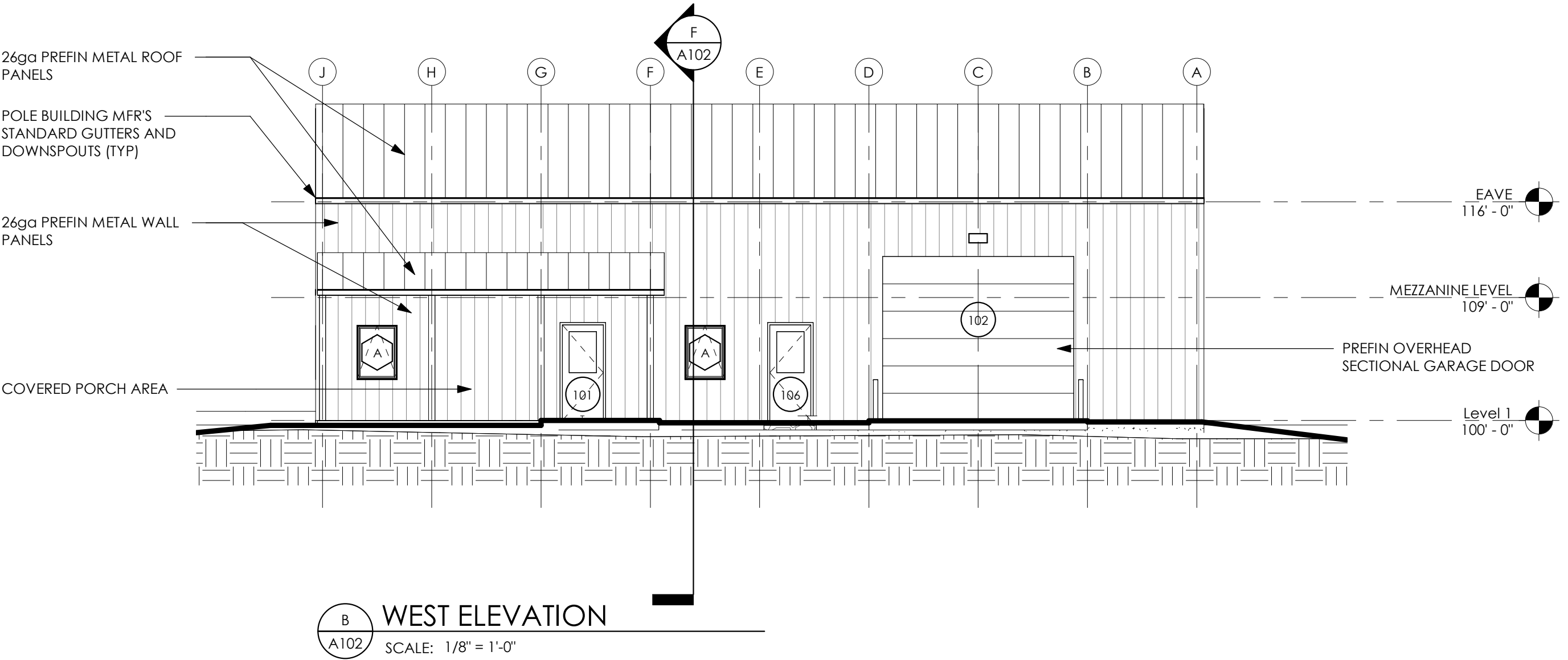
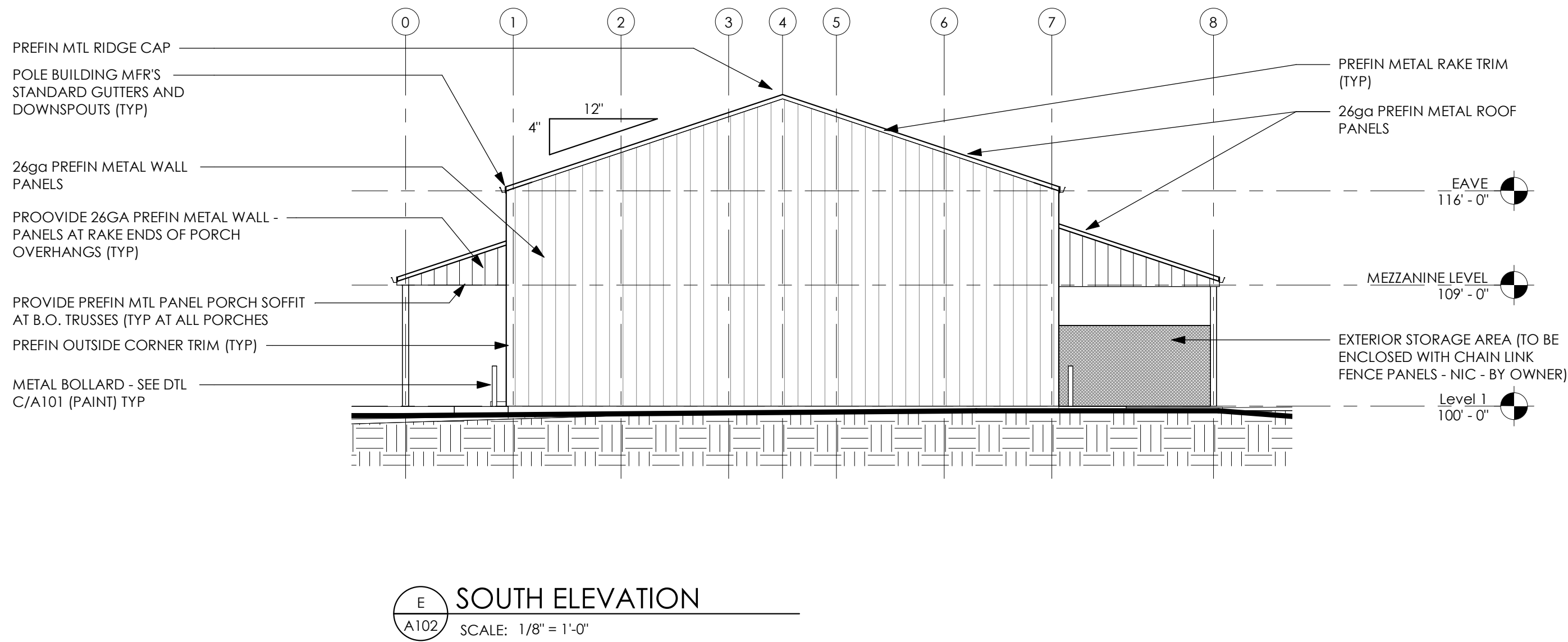
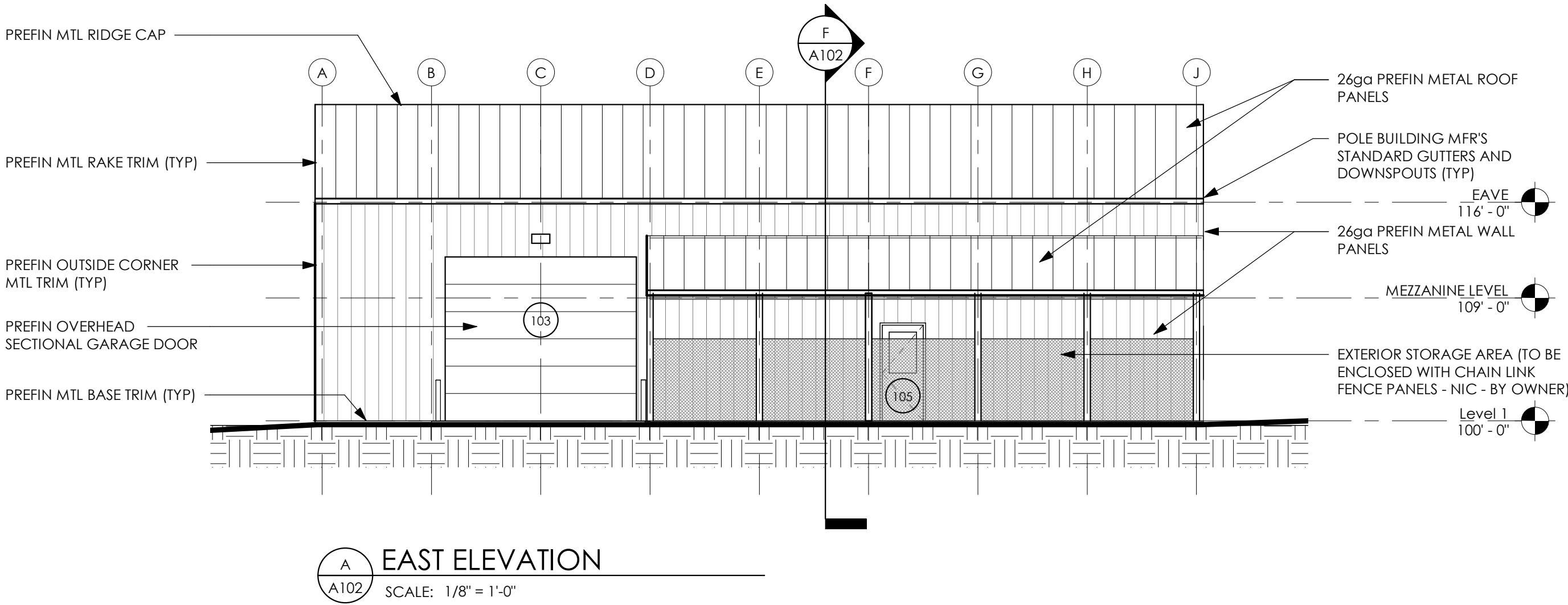
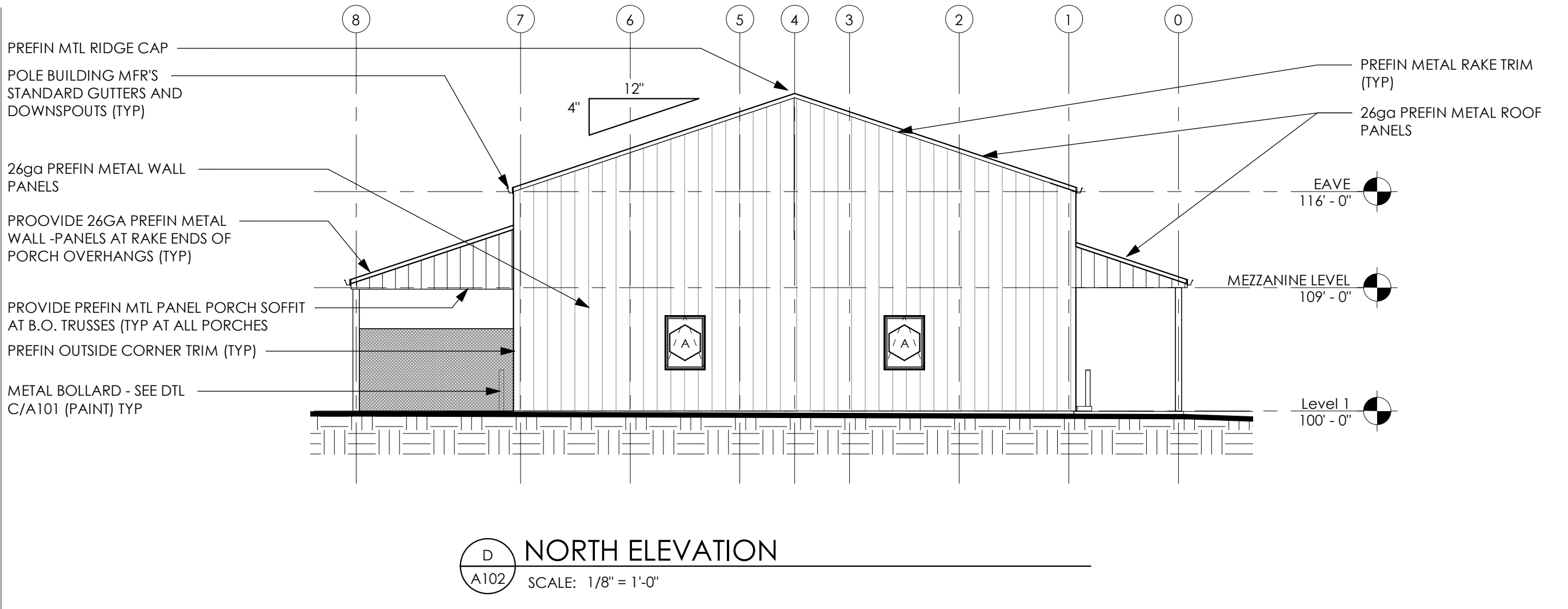
**CONTROL JOINT**  
SCALE: 1 1/2" = 1'-0"


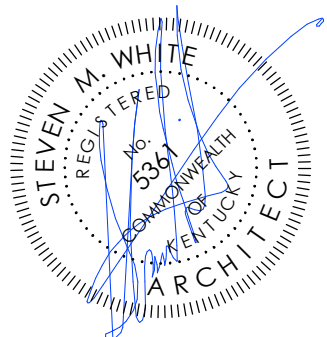


**DOOR HEAD**  
SCALE: 1 1/2" = 1'-0"

	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
	A&E FILE NO.:	0000.00	SHOP FLOOR PLANS	
	DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
	DRAWN BY:	Author	540-C97Q-FF19-00	A101
	CHECKED BY:	Checker	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
	PHASE:	RTA	AS-BUILT DATE:	
	RTA DATE:	11 MAY 2020	DECA LOG NO.	
	REVISION HISTORY OF THIS DOCUMENT		A1C-6915	
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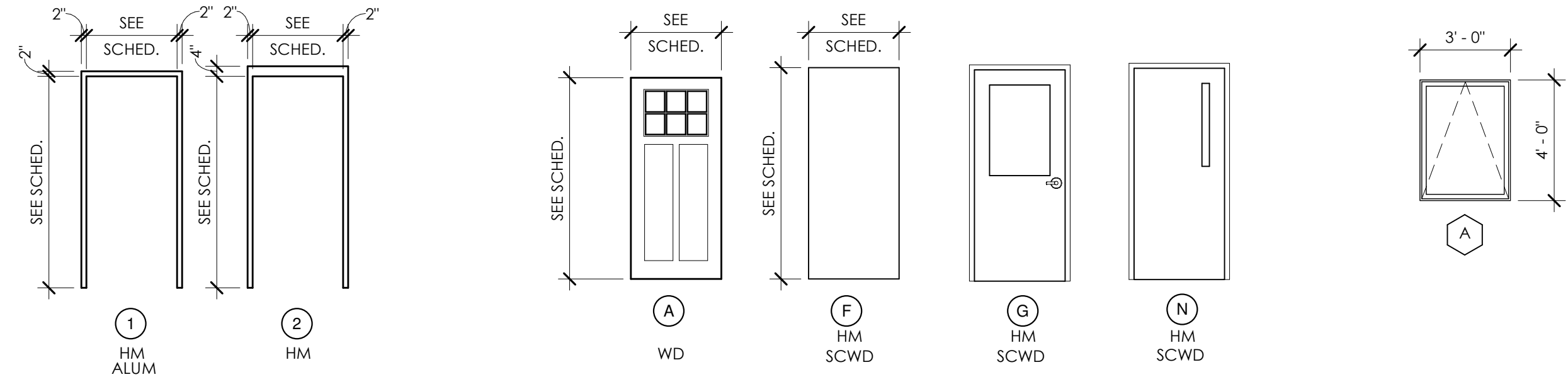




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	A&E FILE NO.: 0000.00		SHOP ELEVATIONS AND SECTIONS						
	DRAWING DATE: 05/11/2020								
	DRAWN BY: Author		ACCOUNT NO. 540-C97Q-FF19-00	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY		DRAWING NO. A102			
	CHECKED BY: Checker		WHITE   POLLARD architects, pllc 561a WEST THIRD STREET LEXINGTON, KENTUCKY 40508 tel: 859.469.9177						
	PHASE: RTA								
	RTA DATE: 11 MAY 2020								
			AS-BUILT DATE:						
		DECA LOG NO. A1C-6916							
		REVISION HISTORY OF THIS DOCUMENT							
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DOOR SCHEDULE																			
MARK	SIZE				TYPE		MATERIAL			FINISH		RATING	DETAILS		HARDWARE SET	REQUIRES SIGNAGE	TO ROOM		COMMENTS
	DBL	WIDTH	HEIGHT	THICKNESS	DOOR	FRAME	DOOR	FRAME	GLASS	DOOR	FRAME		HEAD	JAMB			TO ROOM NO.	TO ROOM NAME	
101	No	3' - 0"	7' - 0"	1 3/4"	G	1	HM*	HM*	INSUL/SAFE	PAINT	PAINT	-	G/A102		01		102	OFFICE	
101B	No	3' - 0"	7' - 0"	1 3/4"	F	1	HM	HM	-	STAIN	PAINT	-	F/A101		02		102	OFFICE	
102		14' - 0"	12' - 0"	2"						FF	PAINT	-			NA		101	SHOP	
103		14' - 0"	12' - 0"	2"						FF	PAINT	-			NA		101	SHOP	
104	No	3' - 0"	7' - 0"	1 3/4"	G	1	SCWD	HM	SAFE	PAINT	PAINT	-	F/A101 SIM		03		101	SHOP	
105	No	3' - 0"	7' - 0"	1 3/4"	G	1	HM	HM	SAFE	PAINT	PAINT	-	G/A102 SIM		01		101	SHOP	
106	No	3' - 0"	7' - 0"	1 3/4"	G	1	HM	HM	SAFE	PAINT	PAINT	-	G/A102 SIM		01		101	SHOP	
201		3' - 0"	6' - 8"	5 55/64"	A	3	SCWD	WD		PAINT	PAINT	-	H/A201 SIM		04	No	201	CABIN	"THICKNESS" INDICATES FRAME DEPTH NOT PANEL THICKNESS
201		3' - 0"	6' - 8"	5 55/64"	A	3	SCWD	WD		PAINT	PAINT	-	H/A201 SIM		04	No	201	CABIN	"THICKNESS" INDICATES FRAME DEPTH NOT PANEL THICKNESS
202	No	3' - 0"	7' - 0"	1 3/4"	F	1	HM	HM	-	PAINT	PAINT	-	H/A201 SIM		05				*CABIN EGRESS DOOR
202	No	3' - 0"	7' - 0"	1 3/4"	F	1	HM	HM	-	PAINT	PAINT	-	H/A201 SIM		05				*CABIN EGRESS DOOR
Grand total: 11																			



DOOR FRAME TYPES

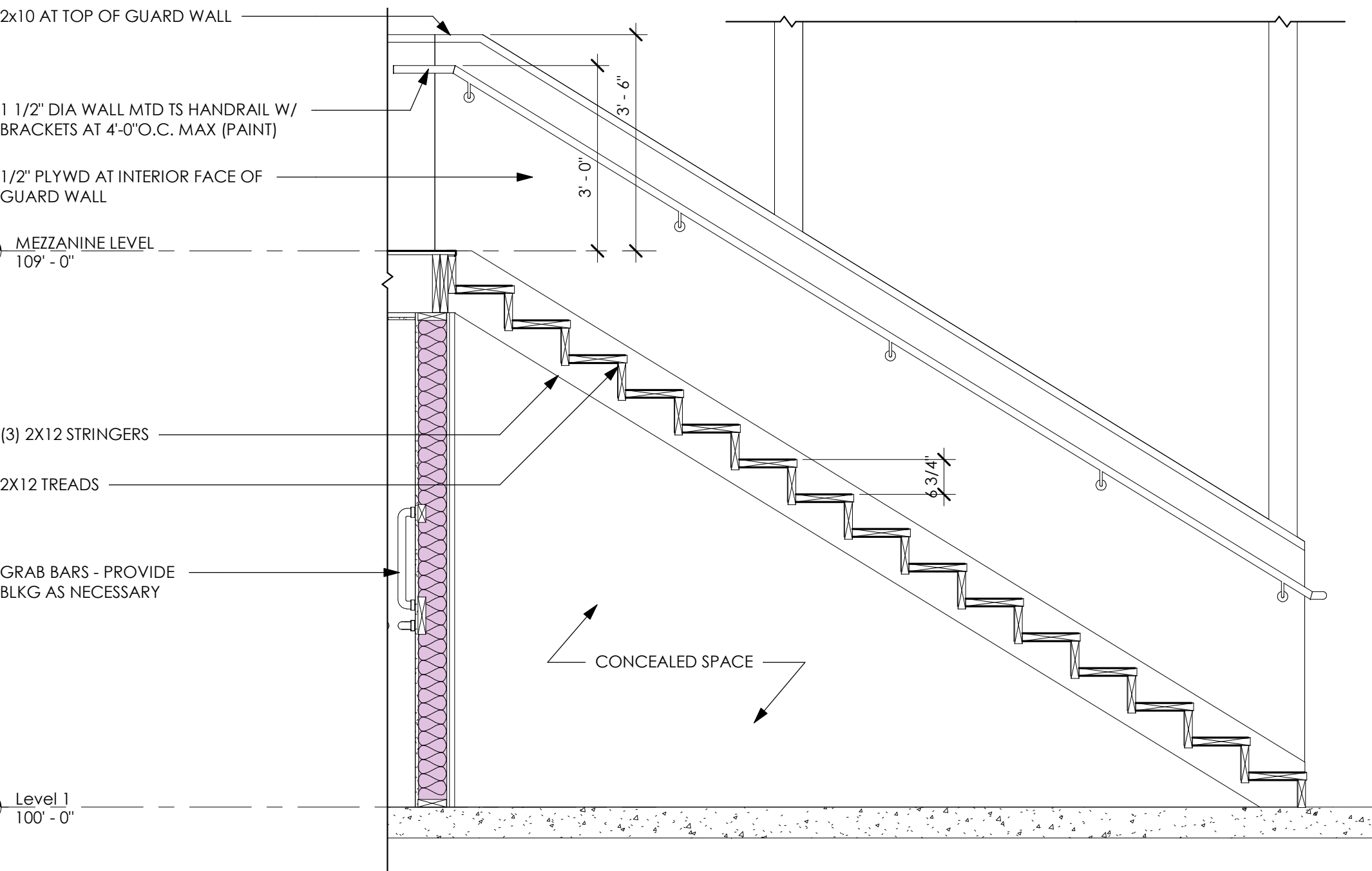
DOOR PANEL TYPES

WINDOW TYPES

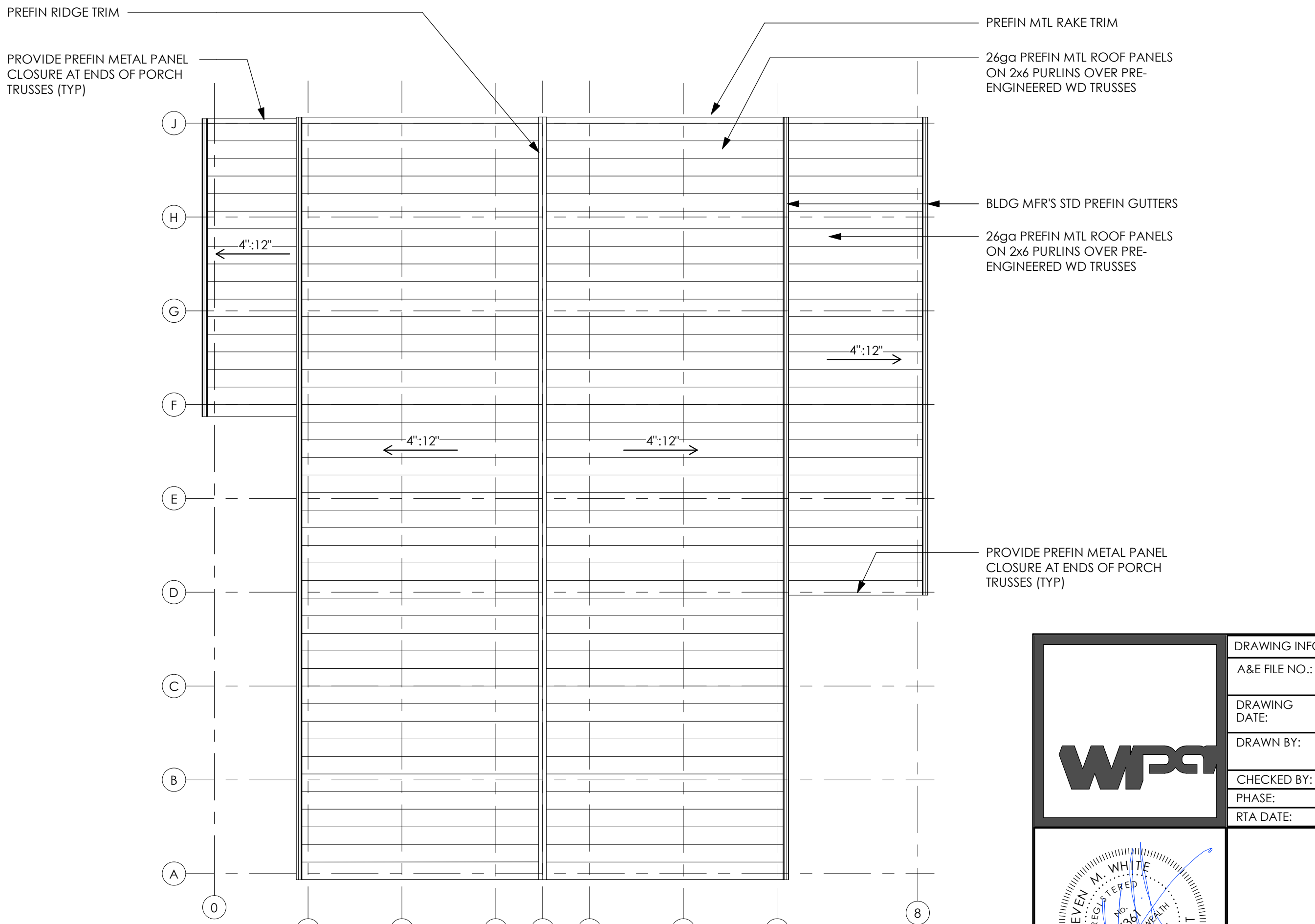
ROOM FINISH SCHEDULE										
NUMBER	ROOM NAME	FLOORS		WALLS		CEILINGS			REMARKS	AREA
		FINISH	BASE	MATERIAL	FINISH	MATERIAL	FINISH			
101	SHOP	CONC	-	-	-	-	-			2179 SF
102	OFFICE	CONC	RB	GYP BD	PAINT	GYP BD	PAINT			329 SF
103	TOILET	CONC	RB	GYP BD	PAINT	GYP BD	PAINT			55 SF
104	MEZZANINE	PLYWD	-	PLYWD*	PAINT	-	-	B		406 SF
201	CABIN	CONC	WD	PLYWD*	PAINT	PLYWD*	PAINT	A		903 SF
201	CABIN	CONC	WD	PLYWD*	PAINT	PLYWD*	PAINT	A		903 SF

ROOM FINISH NOTES

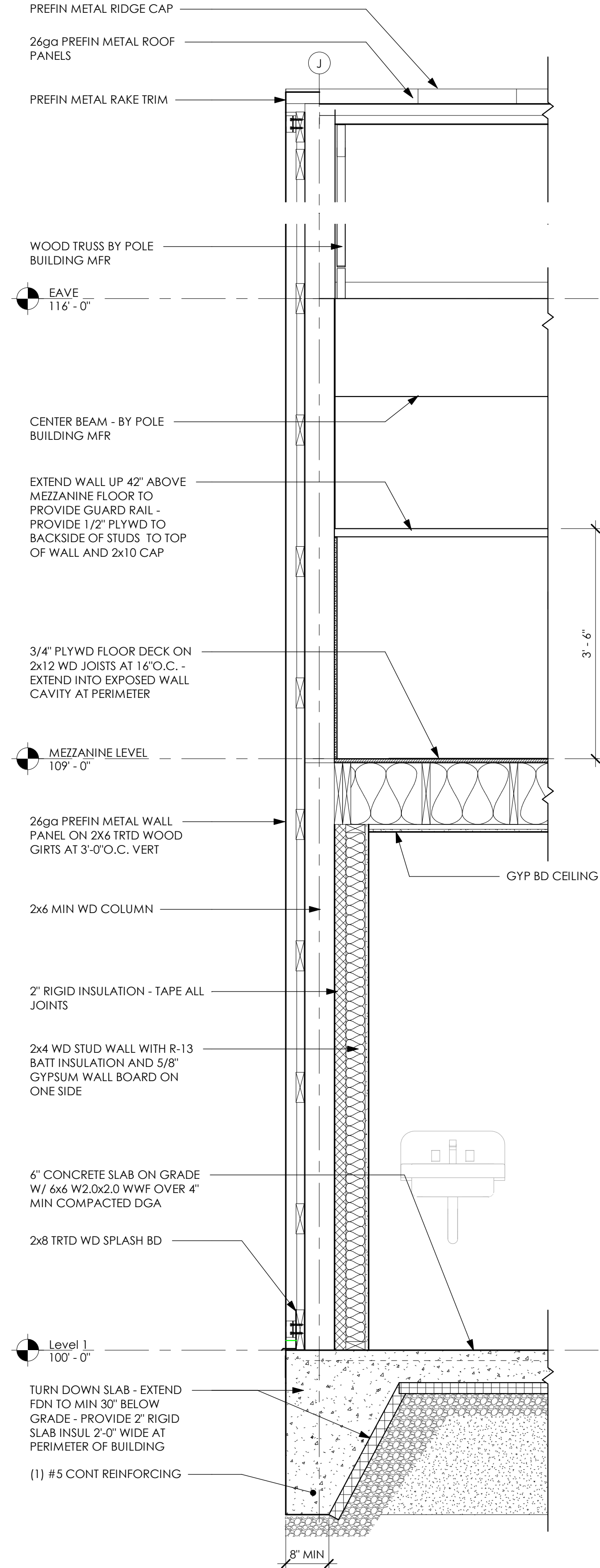
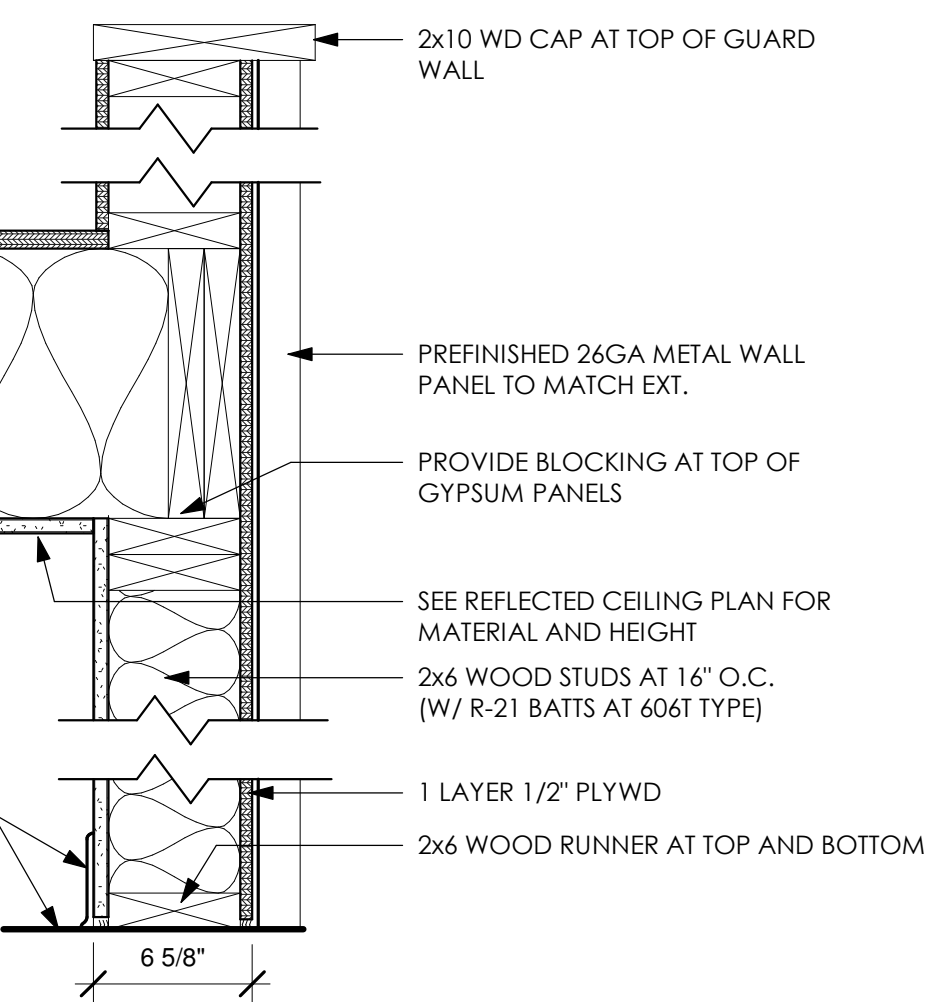
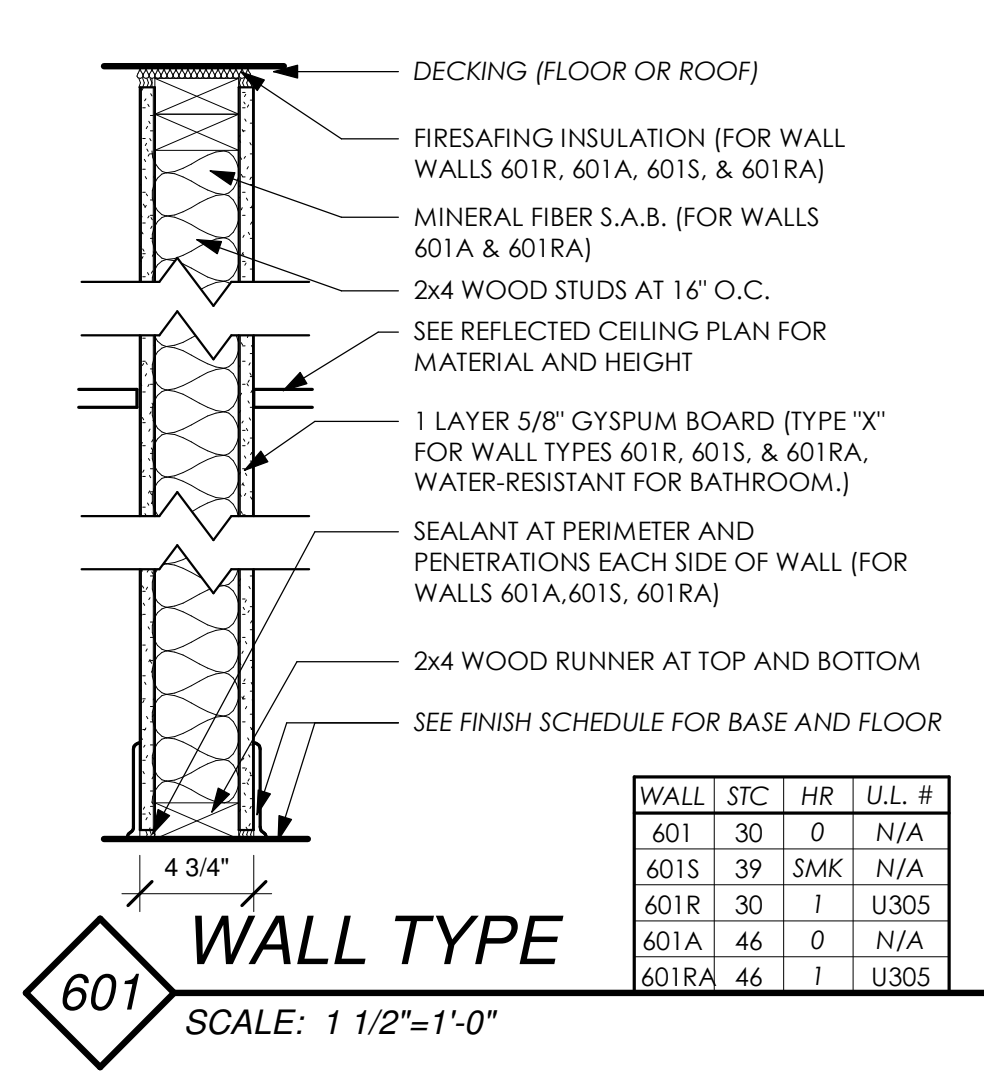
- A 1/2" PLYWD PANELS WITH 1x3 WD BATTENS AT 2'-0" O.C.  
B 1/2" PLYWD AT INSIDE FACE OF GUARD WALLS




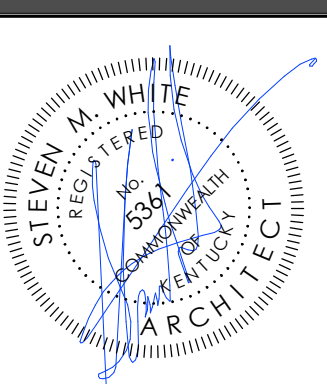
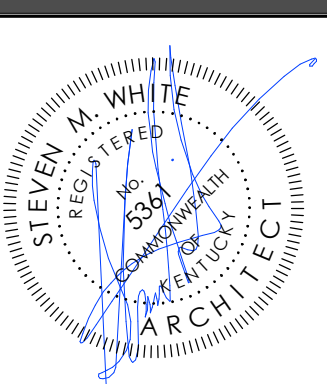
C MEZZANINE STAIR SECTION  
A103 SCALE: 1/2" = 1'-0"

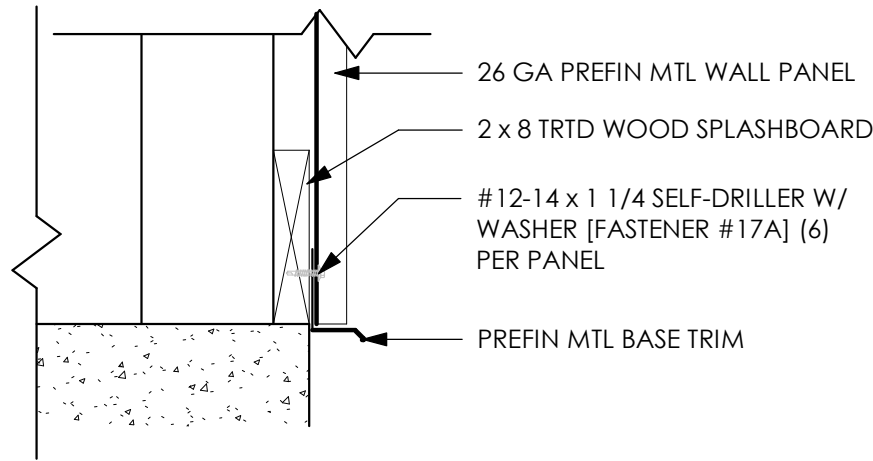
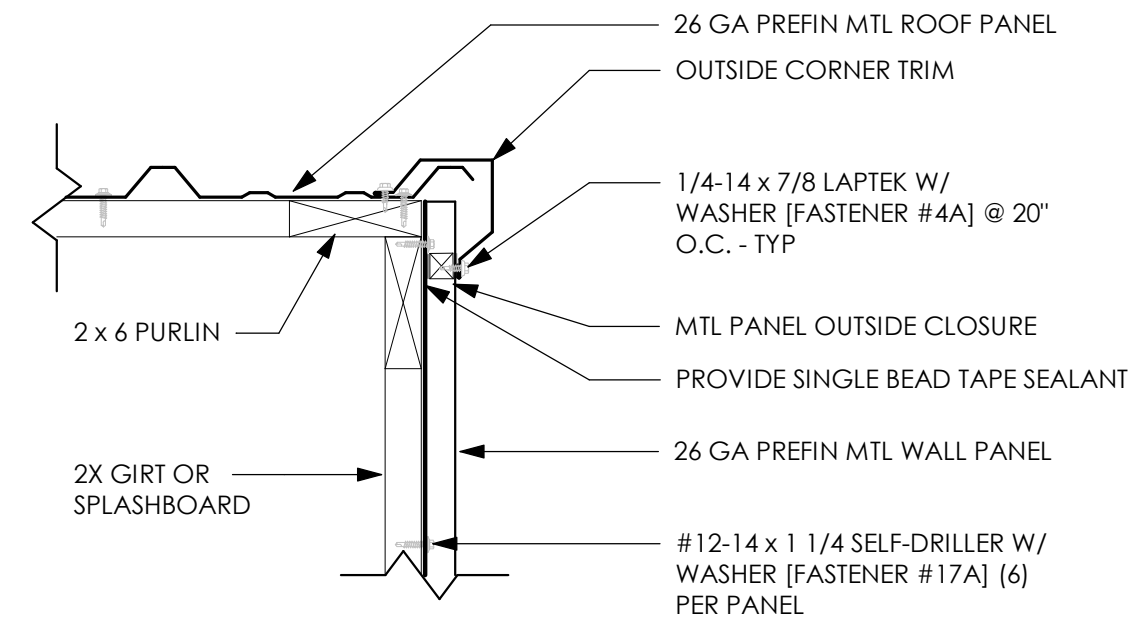
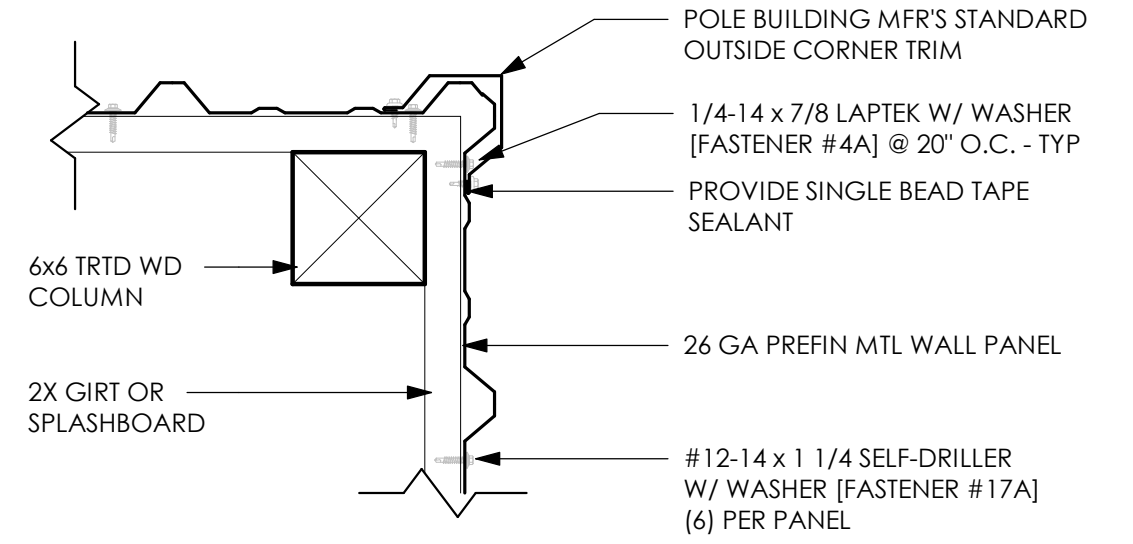
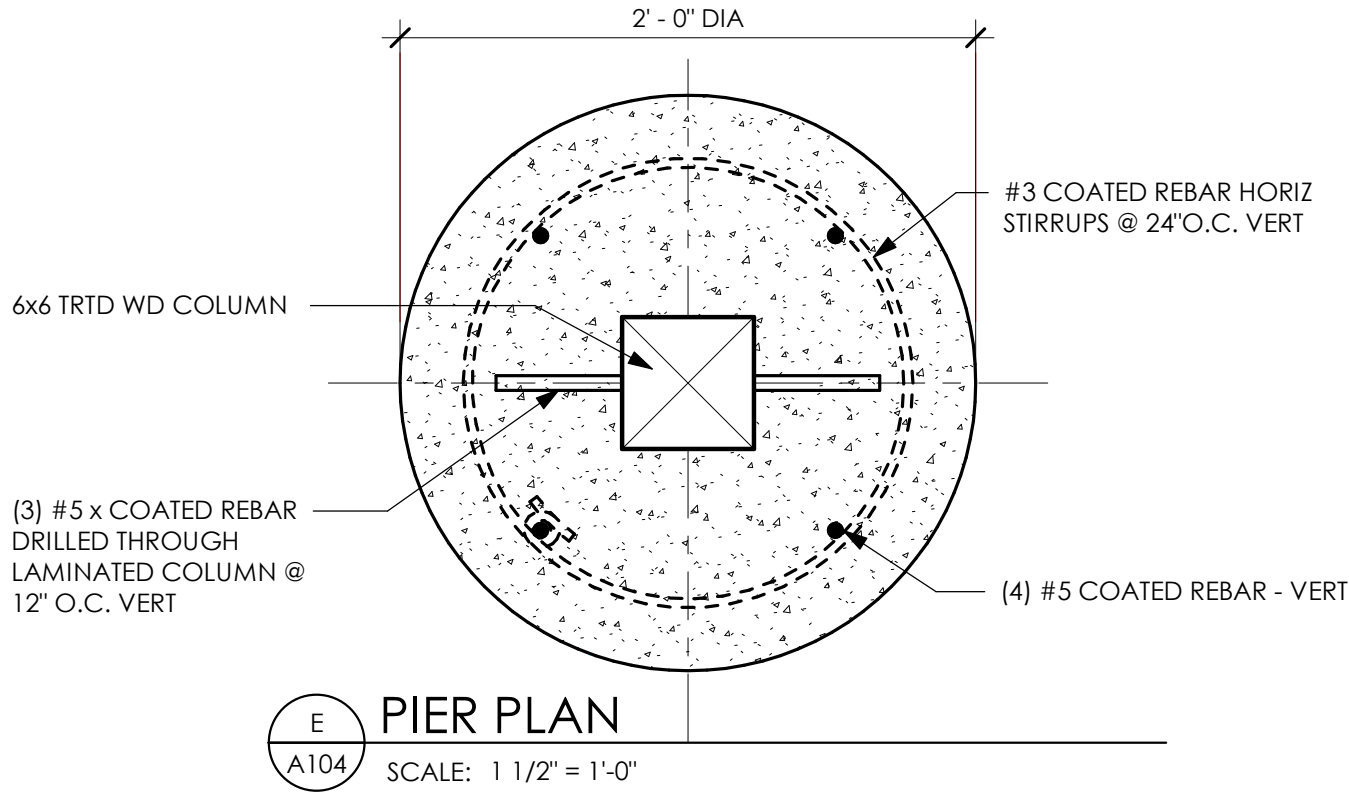
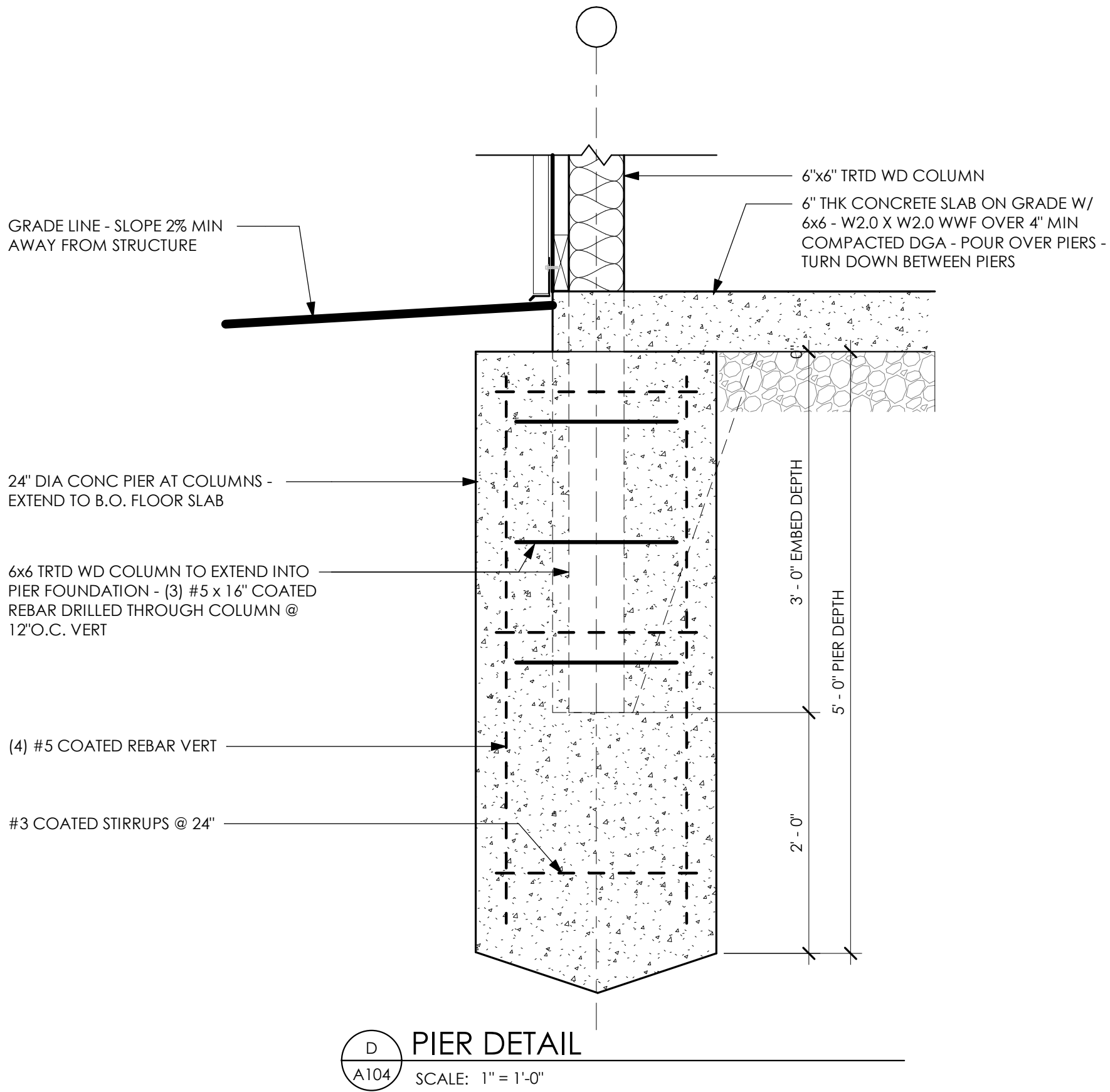



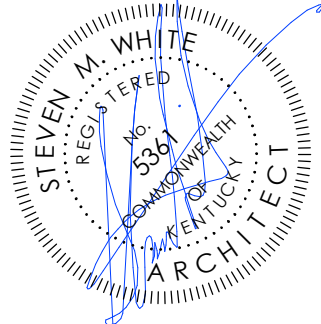
B ROOF PLAN  
A103 SCALE: 1/8" = 1'-0"



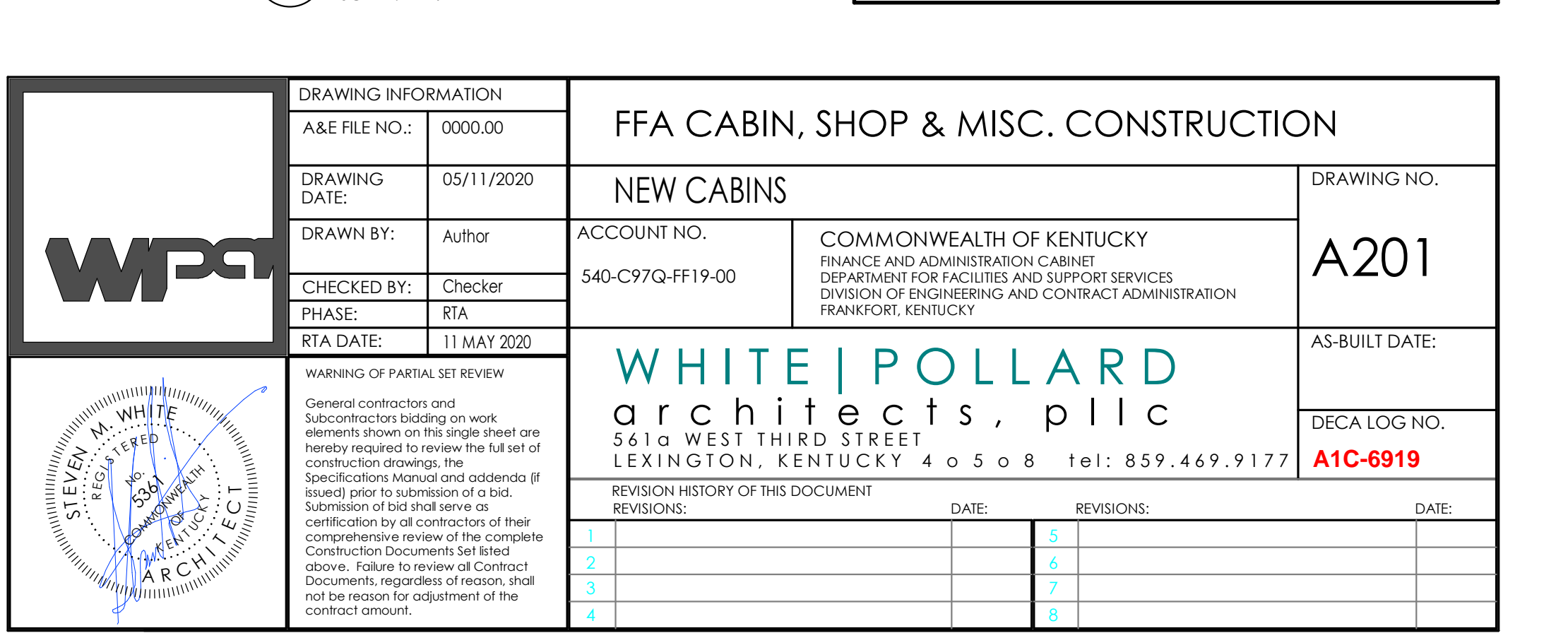
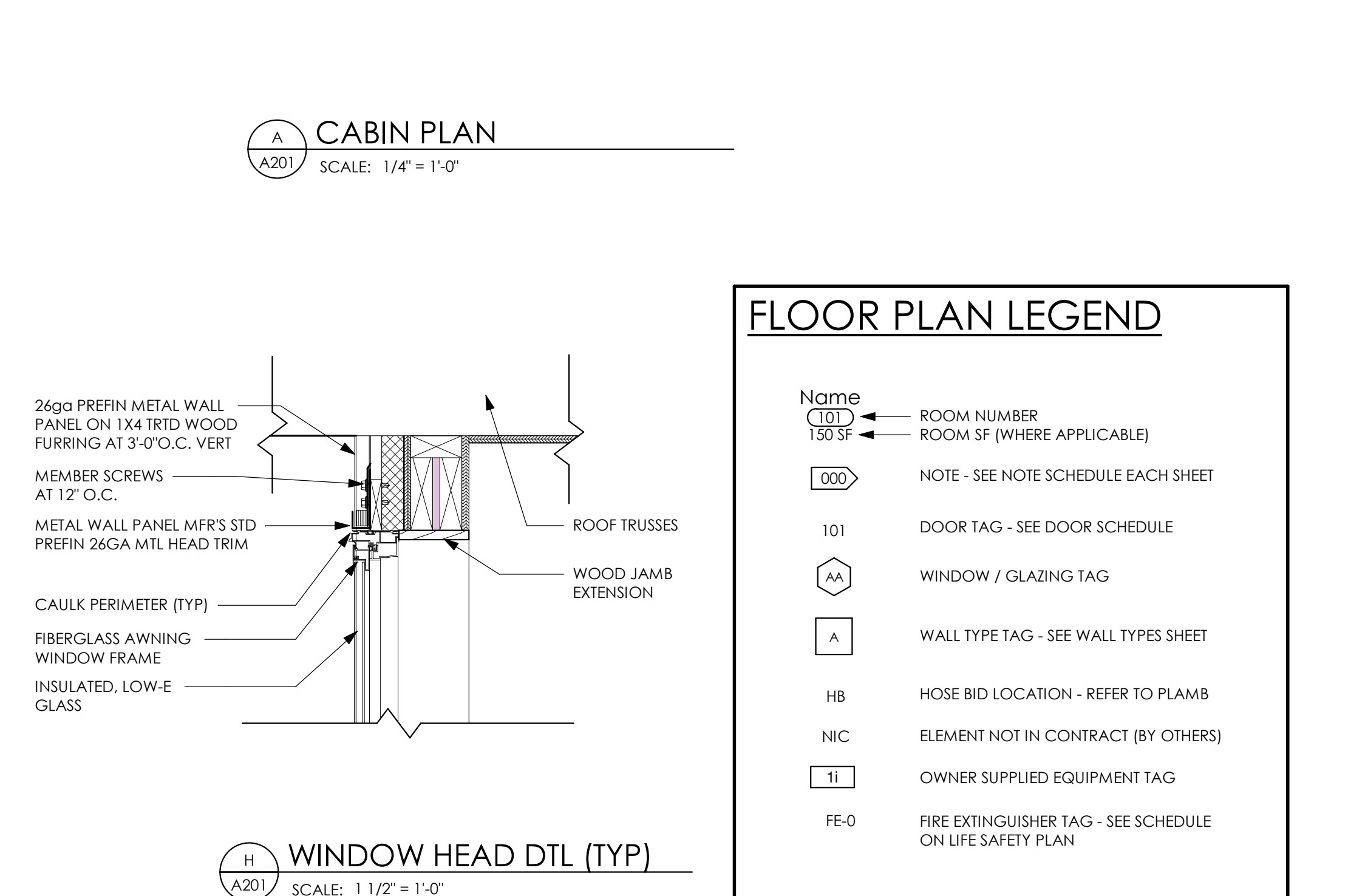
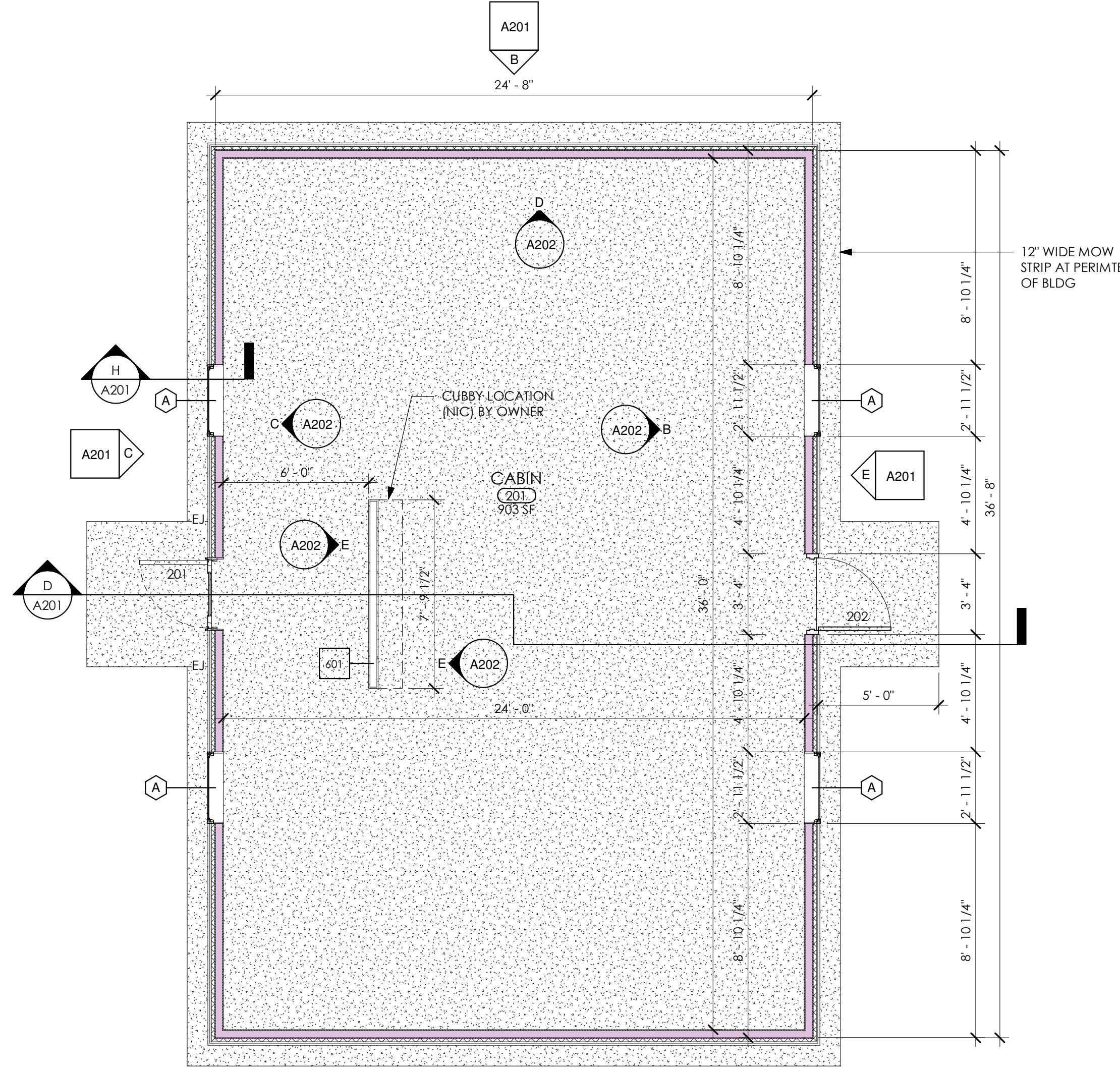
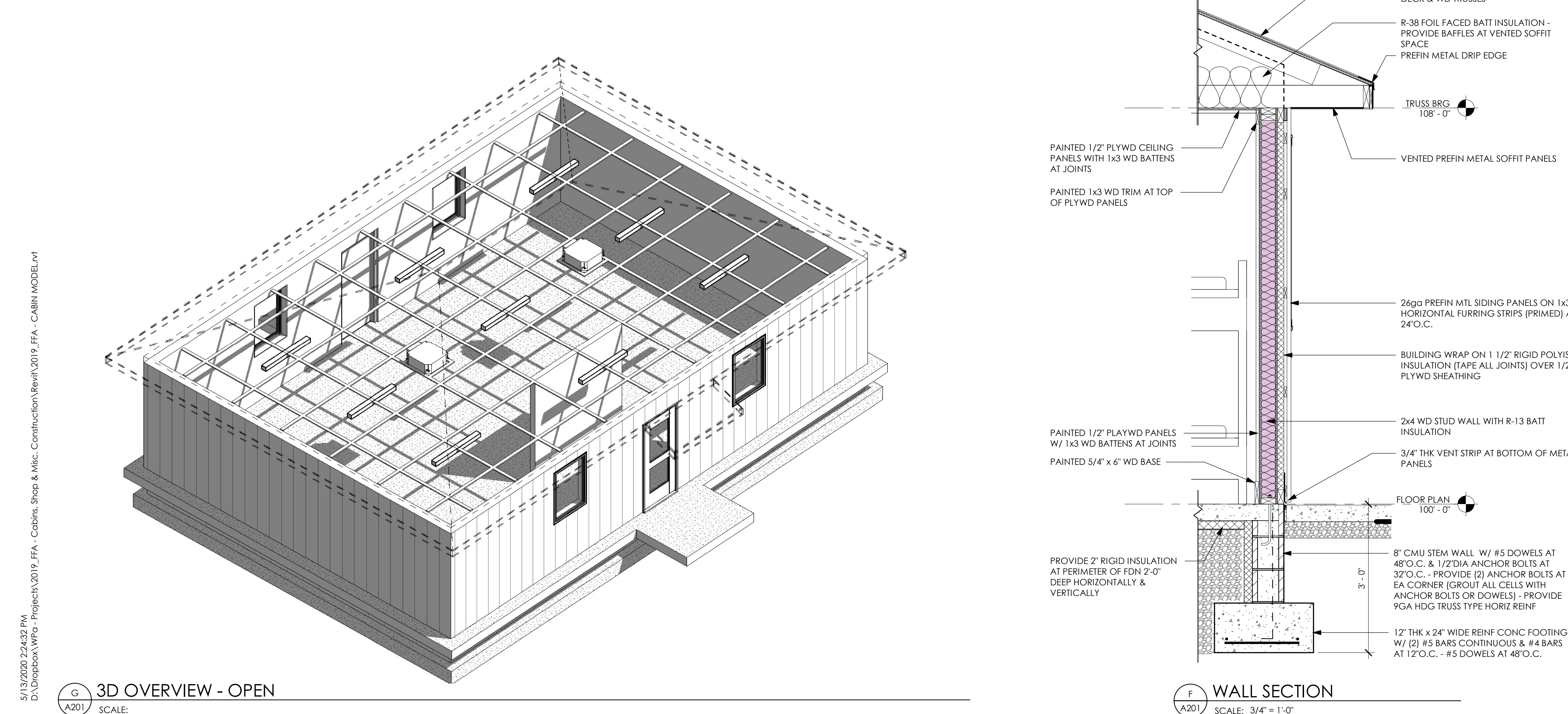
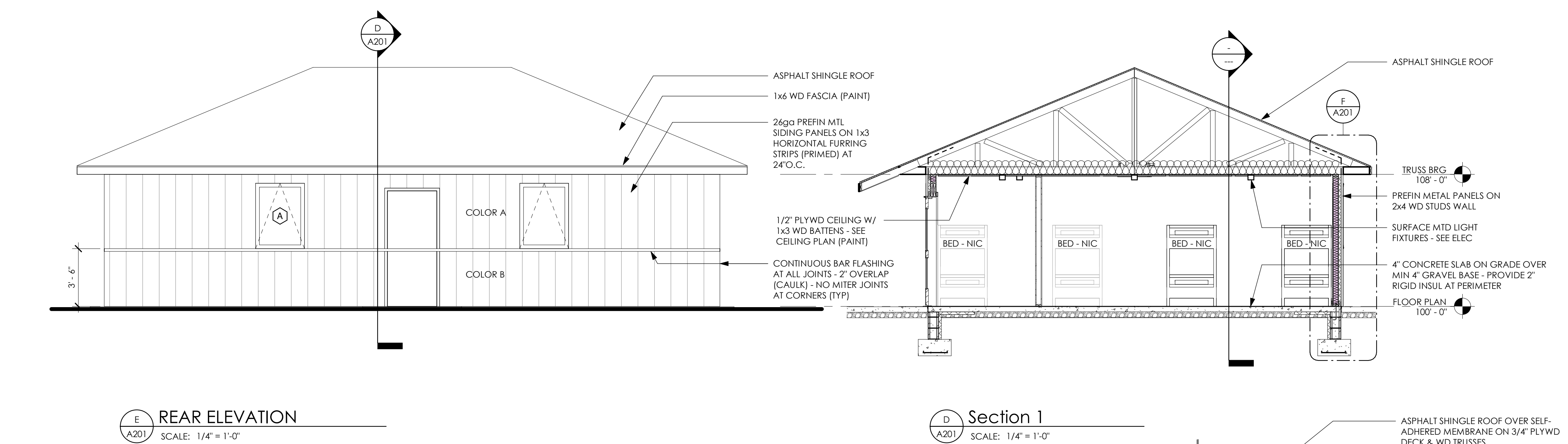
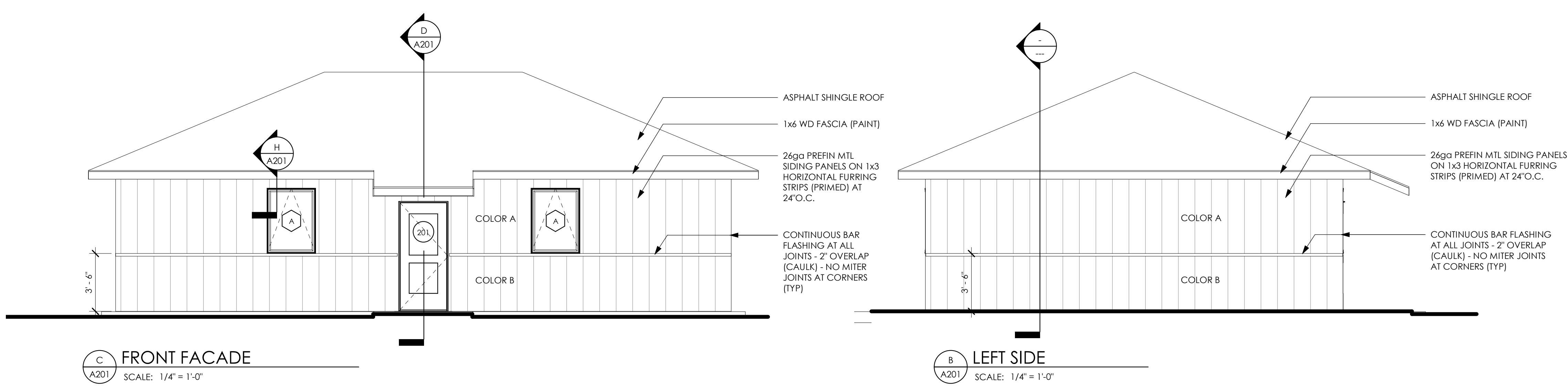
A WALL SECTION  
A103 SCALE: 3/4" = 1'-0"

 	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
	A&E FILE NO.:	0000.00	ROOF PLAN, SCHEDULES & DETAILS	
	DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
	DRAWN BY:	Author	540-C97Q-FF19-00	A103
	CHECKED BY:	Checker	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
	PHASE:	RTA	AS-BUILT DATE:	
	RTA DATE:	11 MAY 2020	DECA LOG NO.	
	REVISION HISTORY OF THIS DOCUMENT		A1C-6917	
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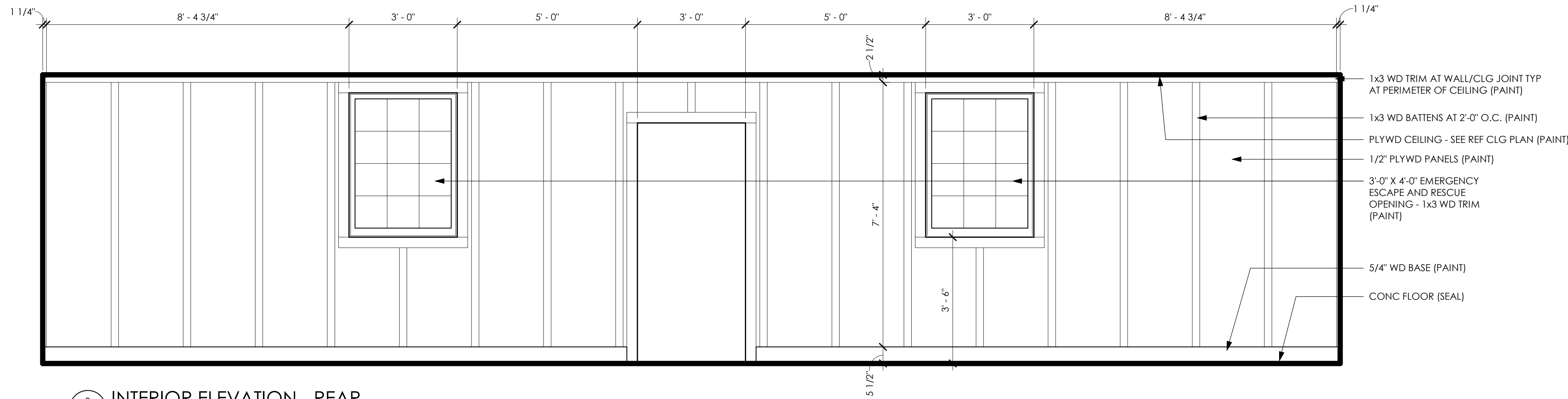


	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION		DRAWING NO.  <b>A104</b>	
	A&E FILE NO.:	0000.00				
	DRAWING DATE:	05/11/2020	DETAILS			AS-BUILT DATE:
	DRAWN BY:	Author	ACCOUNT NO.  540-C97Q-FF19-00	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY		
	CHECKED BY:	Checker	<b>WHITE   POLLARD</b> architects, pllc 561a WEST THIRD STREET LEXINGTON, KENTUCKY 40508 tel: 859.469.9177		DECA LOG NO.  <b>A1C-6918</b>	
	PHASE:	RTA			REVISIONS:	
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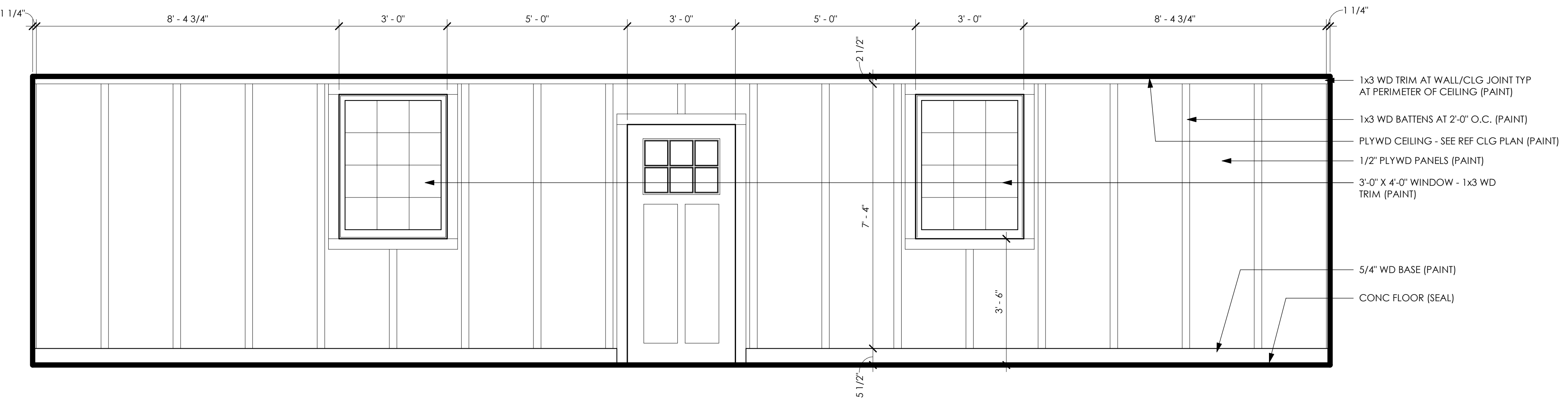




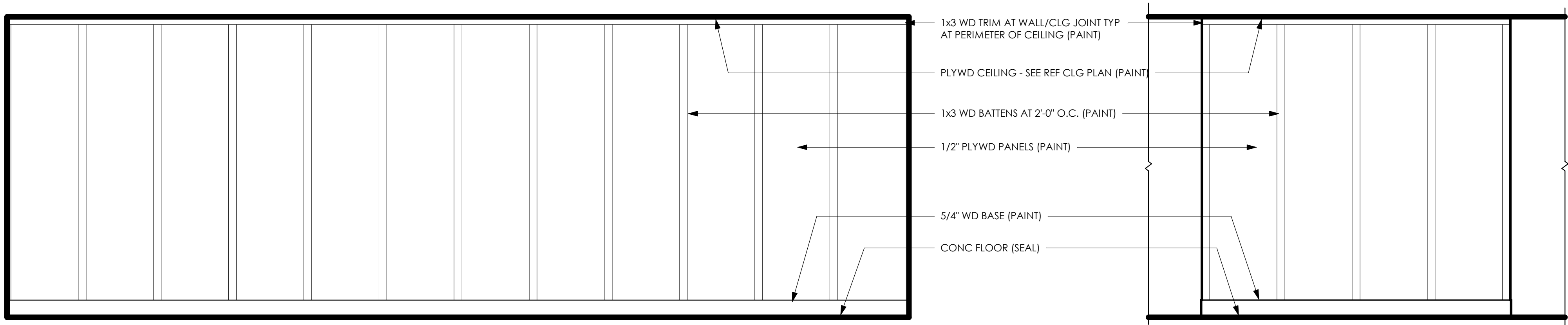




B  
A202  
INTERIOR ELEVATION - REAR  
SCALE: 1/2" = 1'-0"

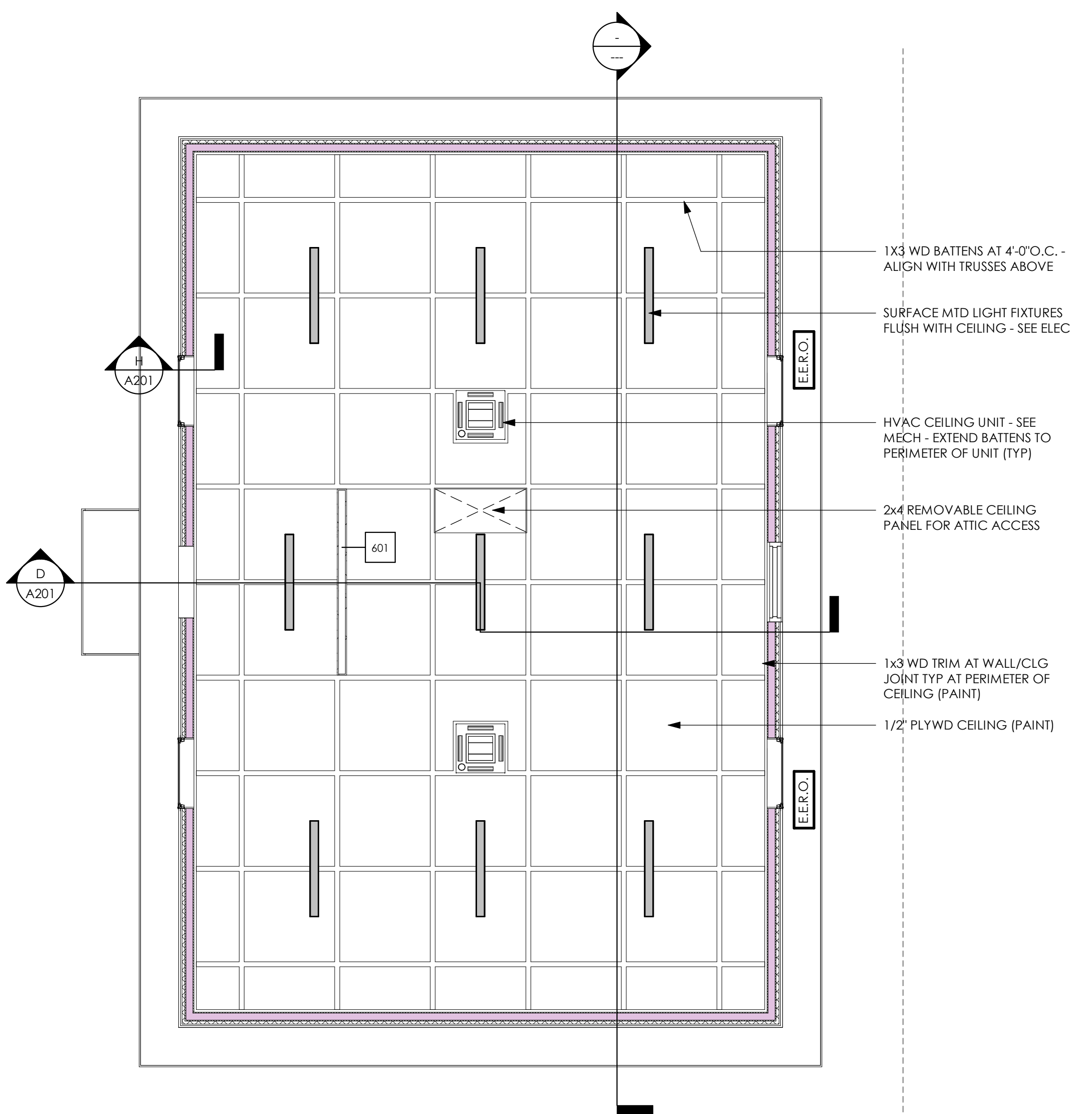


C  
A202  
INTERIOR ELEVATION - FRONT  
SCALE: 1/2" = 1'-0"


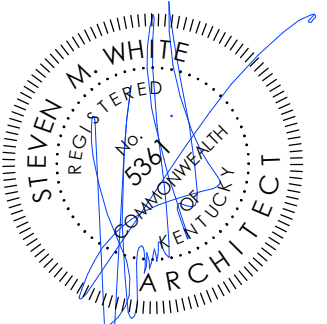


D  
A202  
INTERIOR ELEVATION - SIDE  
SCALE: 1/2" = 1'-0"

E  
A202  
INTERIOR ELEVATION - SCREEN  
SCALE: 1/2" = 1'-0"



A  
A202  
FLOOR PLAN  
SCALE: 1/4" = 1'-0"

 	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
	A&E FILE NO.:	0000.00	CABIN RCP AND INTERIOR ELEVATIONS	
	DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
	DRAWN BY:	Author	540-C97Q-FF19-00	A202
WARNING OF PARTIAL SET REVIEW General contractors and subcontractors bidding on work elements shown on this single sheet are hereby required to review the full set of construction drawings, the Specifications Manual and addenda (if issued) prior to submission of a bid. Submission of bid that serve as certification by all contractors of their comprehensive review of the complete Construction Documents Set listed above. Failure to review all Contract Documents, regardless of reason, shall not be reason for adjustment of the contract amount.	CHECKED BY:	Checker	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AND CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
	PHASE:	RTA	AS-BUILT DATE:	
	RTA DATE:	11 MAY 2020	DECA LOG NO.	
	REVISIONS:		A1C-6920	
REVISION HISTORY OF THIS DOCUMENT		DATE:	REVISIONS:	DATE:
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PLUMBING GENERAL NOTES

GENERAL PROJECT REQUIREMENTS

- A. ALL MATERIALS FURNISHED AND ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED CODES, RULES AND REGULATIONS, INCLUDING BUT NOT LIMITED TO: MECHANICAL, ELECTRICAL, PLUMBING, ENERGY CONSERVATION, BUILDING, NFPA, ASHRAE 62.1 & 90.1, OSHA, UTILITY PROVIDERS, AS WELL AS ALL LOCAL AND STATE CODES. IN ALL CASES, THE MOST STRINGENT SHALL APPLY.
- B. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES, PERMITS, INSPECTIONS AND LICENSES FOR THE COMPLETE INSTALLATION OF HIS WORK. DRAWINGS ARE DIAGRAMMATIC REPRESENTATION OF THE WORK AND INDICATES GENERAL ARRANGEMENT. SEE ARCHITECTURAL AND/OR FOOD SERVICE DRAWINGS FOR EXACT DIMENSIONS.
- C. COORDINATE EXACT PHASING OF ALL WORK WITH GENERAL CONTRACTOR. PREPARE SHOP DRAWINGS TO VERIFY COORDINATION OF WORK BETWEEN TRADES, PRIOR TO INSTALLATION OR PURCHASE OF MATERIAL.
- D. INSTALL EQUIPMENT, MATERIALS, ETC., IN STRICT ACCORD WITH MANUFACTURERS' RECOMMENDATIONS AND DIRECTIONS. ALL INSTALLED COMPONENTS/EQUIPMENT SHALL BE LABELED BY UNDERWRITERS LABORATORIES OR OTHER APPROVED LISTING AGENCY. APPROVED AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT, UNLESS WAIVED BY THE ENGINEER IN WRITING.
- E. ALL ROOF VENTS, DRAINS, CURBS, PIPE PORTALS, ETC. SHALL BE COMPATIBLE WITH THE ROOFING SYSTEM (EITHER EXISTING OR NEW). SEE ARCHITECTURAL PLANS/SPECIFICATIONS FOR MORE INFORMATION. COORDINATE ALL ROOF ACCESSORIES WITH G.C.
- F. ALL SUPPORTS FOR EQUIPMENT, DEVICES OR FIXTURES SHALL BE UNIQUE, FROM THE BUILDING STRUCTURE. DO NOT SUPPORT WORK FROM OTHER TRADES. EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER AND CONSENT OF THE OTHER TRADE, IN WRITING. SUPPORTING FROM CROSS BRACING OR ROOF DECK WILL NOT BE ALLOWED.
- G. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR HIS WORK. ALL CUTTING AND PATCHING SHALL BE IN ACCORDANCE WITH THE ARCHITECT'S STANDARDS FOR SUCH WORK. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. IF IN DOUBT, CONTACT THE OWNER/ARCHITECT AND ENGINEERS FOR CLARIFICATIONS PRIOR TO INSTALLING ANY SUCH WORK.
- H. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. ANY EXPOSED WORK THAT COULD PRESENT AN ENVIRONMENTAL HAZARD (E.G. CONTACT WITH STEAM PIPING, EXPOSED DUCT JOINTS IN A LOW CEILING) SHALL BE PROVIDED WITH ALL REQUIRED PROTECTIVE MEASURES.
- I. DO NOT SCALE FROM DRAWINGS, AS PRINTING DISTORTS SCALE. WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONS SUPPLIED TO THE CONTRACTOR.
- J. THE PURPOSE AND INTENT OF ALL OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, SAFE, LIKE NEW FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE. FURNISH ALL REQUIRED ITEMS EVEN IF NOT SPECIFICALLY SHOWN ON THE DRAWINGS (E.G. OFFSETS, ISOLATION AND BALANCING DEVICES, MAINTENANCE CLEARANCES, ETC.) ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ENGINEER.
- K. MAINTAIN ALL MANUFACTURER AND CODE-REQUIRED SERVICE CLEARANCES, INTAKE/EXHAUST CLEARANCES, ROOF EDGE CLEARANCES FOR ALL NEW AND EXISTING EQUIPMENT, DUCTWORK AND PLUMBING VENTS.

EXISTING CONDITIONS AND UTILITIES

- A. CONTRACTOR SHALL VISIT AND EXAMINE THE SITE PRIOR TO SUBMITTING BID TO BECOME FAMILIAR WITH EXISTING CONDITIONS. NO ALLOWANCE SHALL BE MADE FOR EXISTING CONDITIONS NOT KNOWN TO THE CONTRACTOR. EXISTING EQUIPMENT, DUCT/PIPING (SIZES AND LOCATIONS), ETC. ARE SHOWN FOR REFERENCE ONLY. ADJUST EXACT INSTALLATION AND CONNECTION OF NEW ITEMS ACCORDING TO FIELD CONDITIONS.
- B. CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING BUILDING SERVICES. FOR SAFETY PURPOSES, PARTICULAR ATTENTION SHALL BE PAID TO THIS PRECAUTION RELATIVE TO STEAM, WASTE, HYDRONIC PIPING, NATURAL GAS AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, TYPE, ETC., OF EACH UNDERGROUND OR OVERHEAD UTILITY.
- C. CARE SHALL BE TAKEN BY ALL CONTRACTORS TO AVOID DAMAGING OR DISTURBING EXISTING CONSTRUCTION WHICH IS TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ANY REPAIRS NECESSARY TO RECTIFY DAMAGE AND RESTORE EXISTING CONSTRUCTION TO AN UNDAMAGED STATE UPON COMPLETION OF WORK - THIS SHALL BE PERFORMED AT NO ADDITIONAL COST TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING/PATCHING ANY ABANDONED PENETRATIONS, UNLESS DIRECTED OTHERWISE BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE OF RELOCATED/RETAINED EQUIPMENT AND MATERIALS DURING CONSTRUCTION. ITEMS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- D. INTERRUPTION OF ANY EXISTING SERVICES SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR, UTILITY PROVIDER, OWNER'S DESIGNATED REPRESENTATIVE, AND THE ARCHITECT, AT LEAST TWO WEEKS IN ADVANCE OF THE ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED. TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY, NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED TWO WEEKS IN ADVANCE, IN WRITING. IF UTILITY COMPANY REQUIRES A LONGER NOTIFICATION PERIOD, SO PROVIDE. WHERE INTERRUPTING AN EXISTING UTILITY OR SERVICE DELIBERATELY OR ACCIDENTALLY, THE RESPONSIBLE CONTRACTOR SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME, PROVIDING PREMIUM TIME AS NEEDED.
- E. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING OWNER/ARCHITECT AND ENGINEER OF ANY AND ALL HAZARDOUS MATERIAL ABATEMENT (LEAD, ASBESTOS, ETC.) REQUIRED FOR DEMOLITION AND/OR NEW WORK. IF ANY HAZARDOUS MATERIALS ARE FOUND, THESE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF OWNER/G.C. IMMEDIATELY AFTER DISCOVERY. ABATEMENT WORK WILL BE COVERED UNDER A SEPARATE CONTRACT.

COORDINATION WITH FIRE ALARM AND FIRE/SMOKE-RATED ASSEMBLIES

- A. PROVIDE FIRE STOP PER BUILDING CODE TO ALL CONDUITS PENETRATING THROUGH FIRE RATED WALLS/PARTITION, FLOORS AND CEILINGS. COORDINATION WITH THE GENERAL CONTRACTOR SHALL BE MAINTAINED TO INSURE THAT FIRE STOPPING IS ACCOMPLISHED. USE APPROVED U.L. OR EQUIVALENT SEALANT. CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING/PATCHING ANY PENETRATIONS IN FLOOR/SLAB/WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL PLANS FOR WALL RATINGS.

COORDINATION WITH OTHER TRADES

- A. MECHANICAL CONTRACTOR SHALL VERIFY EXACT MOUNTING LOCATION AND CONNECTION REQUIREMENTS OF ALL PLUMBING/MECHANICAL/FOOD SERVICE EQUIPMENT WITH ALL OTHER INVOLVED TRADES PRIOR TO ROUGH-IN.
- B. CONTRACTOR SHALL COORDINATE LOCATION OF GRILLES/REGISTERS/DIFFUSERS, DUCTWORK, PIPING, ETC. WITH ALL OTHER TRADES TO AVOID CONFLICT WITH CONDUIT, LIGHTING, DUCTWORK, CABLE TRAYS, PIPING AND SPRINKLER PIPING, ETC.
- C. ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT SHALL BE WEATHERPROOF TYPE NEMA 3R. COORDINATE INSTALLATION WITH ELECTRICAL CONTRACTOR.
- D. REFER TO ARCHITECTURAL WALL ELEVATIONS (WHERE GIVEN) FOR HEIGHTS AND MOUNTING RELATIONSHIP OF AIR DEVICES, ACCESS PANELS, THERMOSTATS AND OTHER SENSORS, ETC. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEMS, CONTACT THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. IF APPLICABLE, REFER TO ARCHITECTURAL WALL ELEVATIONS, CEILING HEIGHTS, REFLECTED CEILING PLAN, AND OTHER DETAILS IN THESE DOCUMENTS (AS APPLICABLE).
- E. WHERE PENETRATING NEW OR EXISTING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. ROOFING CONTRACTOR SHALL MAKE ALL ROOF PENETRATIONS.
- F. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL/FIRE ALARM CONTRACTOR FOR PROVISION OF POWER WIRING, DISCONNECTS, SMOKE DETECTORS, INTERRUPTERS, CONTACTS, ETC.

PLUMBING WORK

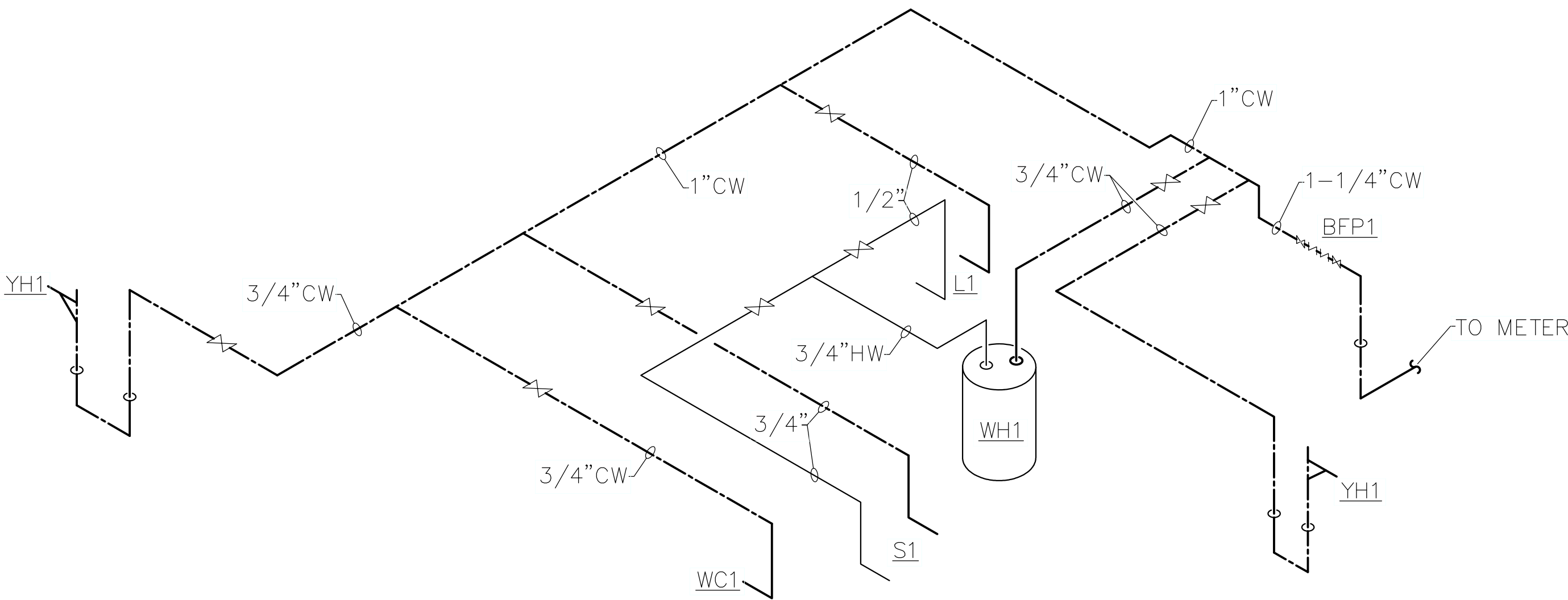
- A. ALL VALVES, SENSORS, OPERATORS, DEVICES, CLEAN OUTS, ETC. SHALL BE ACCESSIBLE. PROVIDE ACCESS PANEL(S) AS REQUIRED WITH PRIOR APPROVAL OF ARCHITECT.
- B. CONTROLS AND OTHER LOW VOLTAGE WIRING SHALL BE PLENUM RATED IF CONDUCTORS PASS THROUGH AN AIR PLENUM.
- C. ALL STRUCTURAL SUPPORTS FOR PLUMBING EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR. PLUMBING CONTRACTOR SHALL INCLUDE DESIGN FOR ALL STRUCTURAL SUPPORT.
- D. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BALANCING ALL PIPING, EQUIPMENT, AND ANY OTHER APPURTENANCES OF THE BUILDING'S MECHANICAL/PLUMBING SYSTEMS. PROVIDE TEST AND BALANCE REPORT TO ENGINEER.
- E. PLUMBING CONTRACTOR SHALL PROVIDE PIPING/DUCT SLEEVES FOR UTILITY ROUTING, AS NECESSARY, IN WALLS, FLOORS AND CEILINGS.
- F. ALL PIPING SYSTEMS SHALL BE INSTALLED WITH A MINIMUM OF FITTINGS, BENDS, POINTS OF CONSTRICTION, ETC. ALL PIPING SHALL BE INSTALLED AT RIGHT ANGLES, WITH LONG-SWEEP ELBOWS. PROVIDE PIPING WITH EXPANSION LOOPS AND APPROPRIATE HANGERS/SUPPORTS.
- G. PROVIDE GAS-FIRED EQUIPMENT WITH DUST/DRIP LEG, SHUT-OFF VALVE(S), REGULATOR, EMERGENCY SHUT-OFF SWITCH, EARTH-QUAKE SWITCH AND ANY OTHER ACCESSORIES AS DICTATED BY THE CONSTRUCTION DOCUMENTS AND ANY APPLICABLE CODES OR SAFETY STANDARDS.
- H. INSTALL NO PIPING, ETC., IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING AND THE COLLECTION OF CONDENSATION THEREON.
- I. UNLESS OTHERWISE DIRECTED BY THE OWNER, ALL NEW EQUIPMENT, SENSORS, CONTROLLERS, ETC. SHALL BE FULLY INTEGRATED AND INTEROPERABLE WITH EXISTING CONTROLS SYSTEM.
- J. CONTRACTOR SHALL COORDINATE LOCATION OF PIPING, FIXTURES, LINT TRAPS, GREASE TRAPS, ETC. WITH ALL OTHER TRADES TO AVOID CONFLICT WITH CONDUIT, LIGHTING, DUCTWORK, PIPING AND SPRINKLER PIPING, ETC.
- K. ALL PIPING SHALL BE RUN INSIDE OF THE BUILDING AND AWAY FROM EXTERIOR WALLS. ANY PIPE THAT MUST BE INSTALLED WHERE EXPOSED TO THE OUTDOORS SHALL BE PROVIDED WITH HEAT TAPE - MINIMUM OF EIGHT (8) WATTS PER LINEAR FOOT. COORDINATE POWER WITH ELECTRICAL CONTRACTOR.
- L. ALL PIPING RUNS ARE REPRESENTATIVE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CONDITIONS IN THE FIELD (EXISTING, OR PREDICATED BY NEW CONSTRUCTION) THAT MAKE NECESSARY ALTERNATE ROUTING OF PIPING.
- M. CONTRACTOR SHALL PROVIDE AND INSTALL ALL CODE-REQUIRED WALL, FLOOR AND YARD CLEAN OUTS TO ENSURE COMPLIANCE WITH CODE AUTHORITY, LOCAL AHJ, ETC. AND TO ENSURE EASE OF MAINTENANCE FOR FACILITY STAFF.

PLUMBING BASIS OF DESIGN

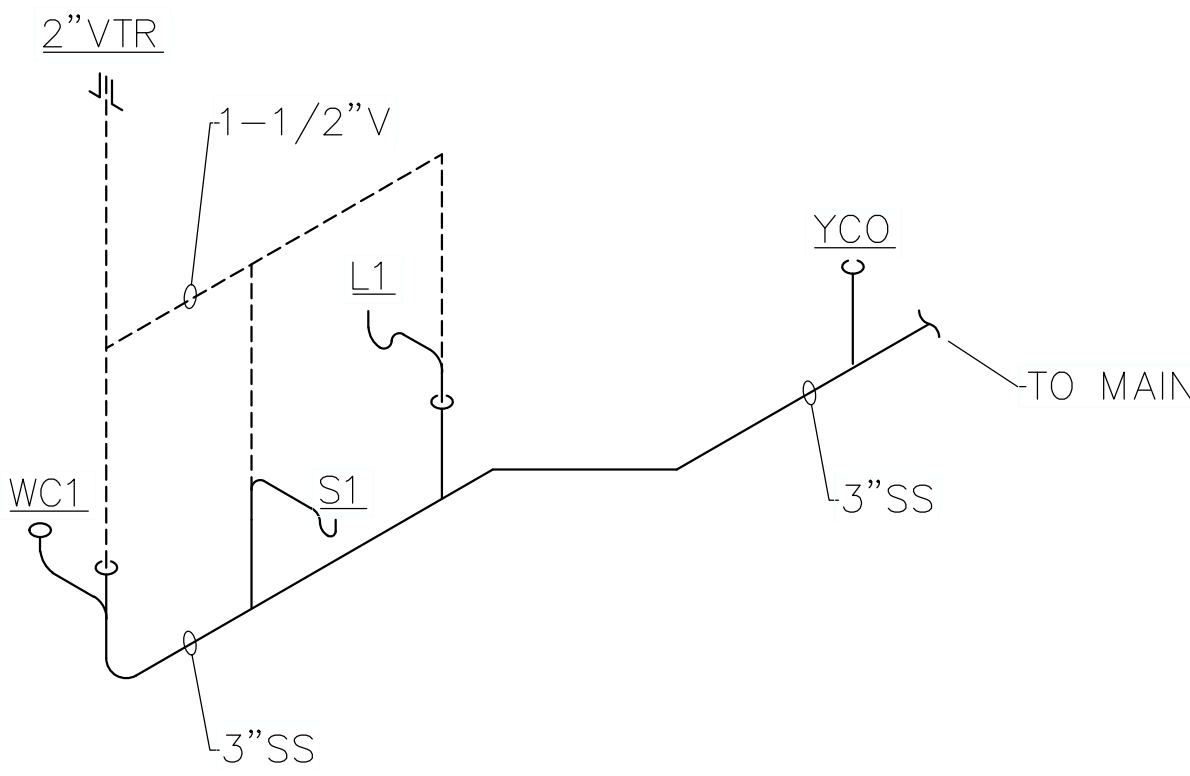
- A. THE PLUMBING DESIGN AND SUBSEQUENT CONSTRUCTION, INCLUDING BUT NOT LIMITED TO: WASTE/VENT SIZING AND LAYOUT, FITTINGS AND CONNECTIONS, FIXTURE UNIT COUNTS, HW/CW REQUIREMENTS, ETC. IS BASED UPON COMPLIANCE WITH THE LATEST EDITIONS OF THE KENTUCKY PLUMBING CODE.
- B. PLUMBING LINES SHALL NOT BE PERMITTED TO BE RUN ABOVE ELECTRICAL ROOMS, TELECOMMUNICATION ROOMS, OR ELECTRICAL EQUIPMENT/PANELS.
- C. AT THE TIME OF DESIGN, NO DOMESTIC WATER FLOW TEST DATA WAS AVAILABLE AND/OR PROVIDED TO THE ENGINEER. THIS DESIGN ASSUMES A MINIMUM OF 60 PSIG INCOMING DOMESTIC WATER PRESSURE. INCOMING DOMESTIC WATER PIPING SHALL BE SIZED BASED UPON AVAILABLE WATER PRESSURE - PROVIDE PRESSURE REDUCING VALVE ASSEMBLY AS REQUIRED. NEW WATER METER(S) SHALL BE SIZED FOR A MINIMUM OF 150% OF THE TOTAL DEMAND OF THE FIXTURES SHOWN IN THESE CONSTRUCTION DOCUMENTS. COORDINATE METER INSTALLATION ENGINEER ASSUMES NO LIABILITY FOR INSUFFICIENT WATER PRESSURE.
- D. PLUMBING FIXTURE FLOW REQUIREMENTS ARE BASED UPON THE VALUES GIVEN IN THE SCHEDULES. SUBSTITUTION OF FIXTURES WITH DIFFERENT PERFORMANCE MAY ADVERSELY AFFECT THE GAS, WASTE/VENT, AND DOMESTIC WATER PIPE SIZING. IN CASES WHERE THIS REQUIRES LARGER PIPING AND/OR DIFFERING LAYOUT, CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIAL REQUIRED TO ENSURE CODE COMPLIANCE AND ACCEPTABLE PERFORMANCE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LABOR AND MATERIAL TO PROVIDE DOMESTIC WATER AND WASTE SERVICE TO THE BUILDING - COORDINATE AS REQUIRED WITH WATER/SEWER UTILITY.
- E. CONTRACTOR SHALL PROVIDE AND INSTALL A FULLY WORKING PLUMBING SYSTEM INCLUDING: WASTE/VENT PIPING, HW/CW PIPING, WATER HEATERS(S), FLUE AND VENT, ETC.
- E.A. SHOP: PROVIDE AND INSTALL TOILET, LAVATORY AND SINK FIXTURE AS SHOWN FOR THE SHOP. PROVIDE AND INSTALL AN ELECTRIC WATER HEATER. THE SERVICE SINK IN THE SHOP SHALL BE PROVIDED WITH MEANS OF DRAIN DOWN DURING THE WINTER.
- E.B. NEW DOMESTIC WATER LINES INSIDE OF THE SHOP SHALL BE PROVIDED WITH RIGID FIBERGLASS INSULATION AND HEAT TRACE TAPE - MINIMUM 8W/FT. COORDINATE PROVISION OF POWER WITH ELECTRICAL CONTRACTOR.
- E.C. EXTEND NEW SANITARY WASTE LINE TO THE EXISTING MAINS ON SITE. SEE SITE PLAN FOR MORE INFORMATION.
- E.D. PROVIDE AND INSTALL NEW WATER SERVICE, METER, BACKFLOW PREVENTER, ETC.

PLUMBING LEGEND

	WC	WATER CLOSET – WALL HUNG FLUSH VALVE	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER		SANITARY WASTE
	WC	WATER CLOSET – FLOOR SET FLUSH VALVE	SB	COLD WATER SUPPLY BOX		SANITARY VENT
	WC	WATER CLOSET – FLOOR SET FLUSH TANK	CO	CLEANOUT		DOMESTIC COLD WATER
	U	URINAL	WCO	WALL CLEANOUT		DOMESTIC HOT WATER
	L	LAVATORY – WALL HUNG	FCO	FLOOR CLEANOUT		DOMESTIC HOT WATER RETURN
	S	SINK – WALL HUNG	YCO	YARD CLEANOUT		NATURAL GAS
	S	SINK – DROP-IN	VTR	VENT THRU ROOF		STORM DRAINAGE
	MB	MOP BASIN	RD	ROOF DRAIN		OVERFLOW DRAINAGE
	SH	SHOWER	OD	OVERFLOW DRAIN		BALL VALVE
	DF	DRINKING FOUNTAIN	OR	OPEN RECEPTOR		SHUT-OFF VALVE
	FD	FLOOR DRAIN	EXST	EXISTING		PRESSURE REDUCING VALVE
	TMV	THERMOSTATIC MIXING VALVE	BFF	BELOW FINISH FLOOR		BALANCING STATION SEE DETAIL
			AFF	ABOVE FINISH FLOOR		STRAINER
			AFG	ABOVE FINISHED GRADE		REDUCED PRESSURE BACKFLOW PREVENTER
			S.S.	STORM SEWER		FLOW-IN DIRECTION OF ARROW
			F.F.E.	FINISHED FLOOR ELEVATION		VALVE IN VERTICAL
			I.E.	INVERT ELEVATION		RISER OR DROP
				RECIRCULATING PUMP		BRANCH CONNECTION OFF TOP
				CONNECTION POINT – NEW TO EXISTING		RISER DOWN
				LIMIT OF REMOVAL		RISER UP
				WALL HYDRANT		
				WATER HAMMER ARRESTER ZURN Z-1700 SIZE A-(100), B-(200), C-(300), D-(400)		



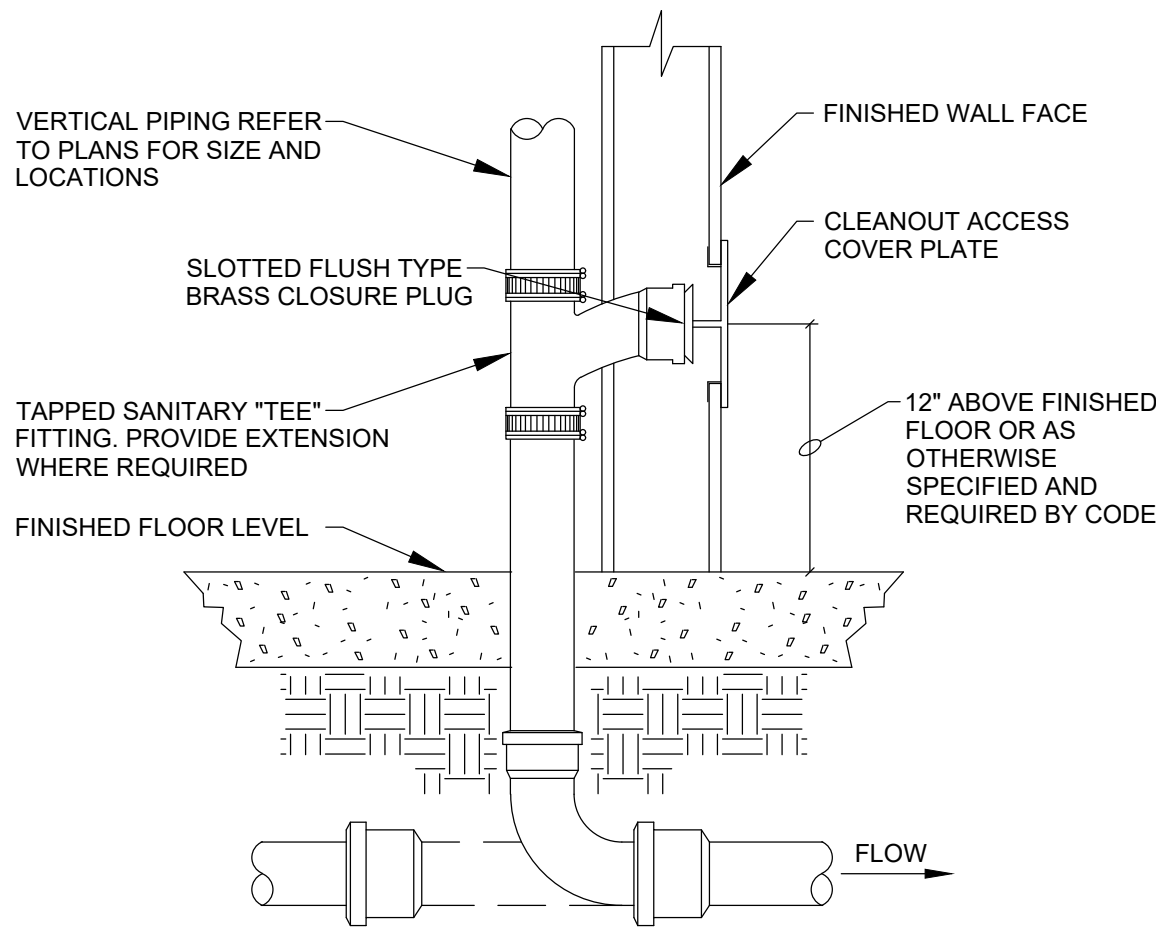
1 HW/CW RISER DIAGRAM  
P001 SCALE: 1/4" = 1'-0"



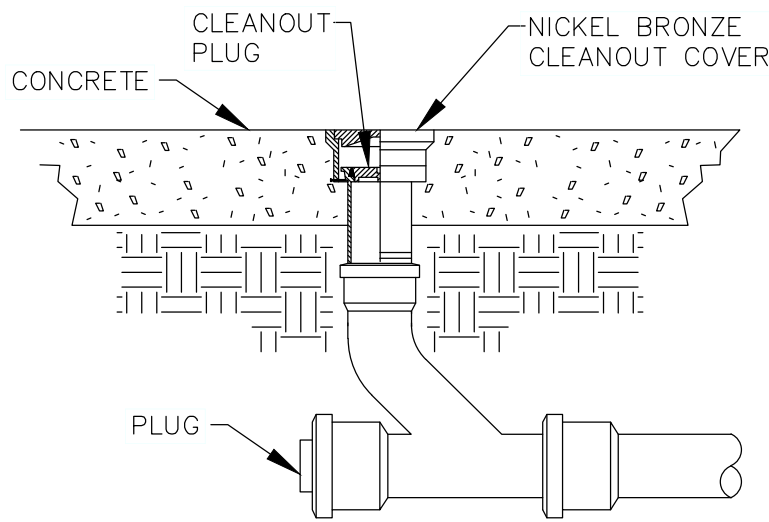
2 WASTE/VENT RISER DIAGRAM  
P001 SCALE: 1/4" = 1'-0"

DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
A&E FILE NO.	2019-24	PLUMBING GENERAL NOTES, RISERS, SYMBOLS, ETC.	
DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
DRAWN BY:	TP	540-C97Q-FF19-00	P001
CHECKED BY:	JM	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
PHASE	RTA	DECA REVIEWED	
RTA DATE:	5/11/2020	FOR INTENT ONLY DECA LOG # A1C-6921	
STAMP:		RAMPART ENGINEERING E: JEFFREY@RAMPARTENGINEERING.COM	
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STATE OF KENTUCKY JEFFREY E. MCBRIDE 28473 LICENSED PROFESSIONAL ENGINEER		REVISION HISTORY OF THIS DRAWING	
DESCRIPTION OF REVISIONS		DATE	DESCRIPTION OF REVISIONS
1		5	
2		6	
3		7	
4		8	

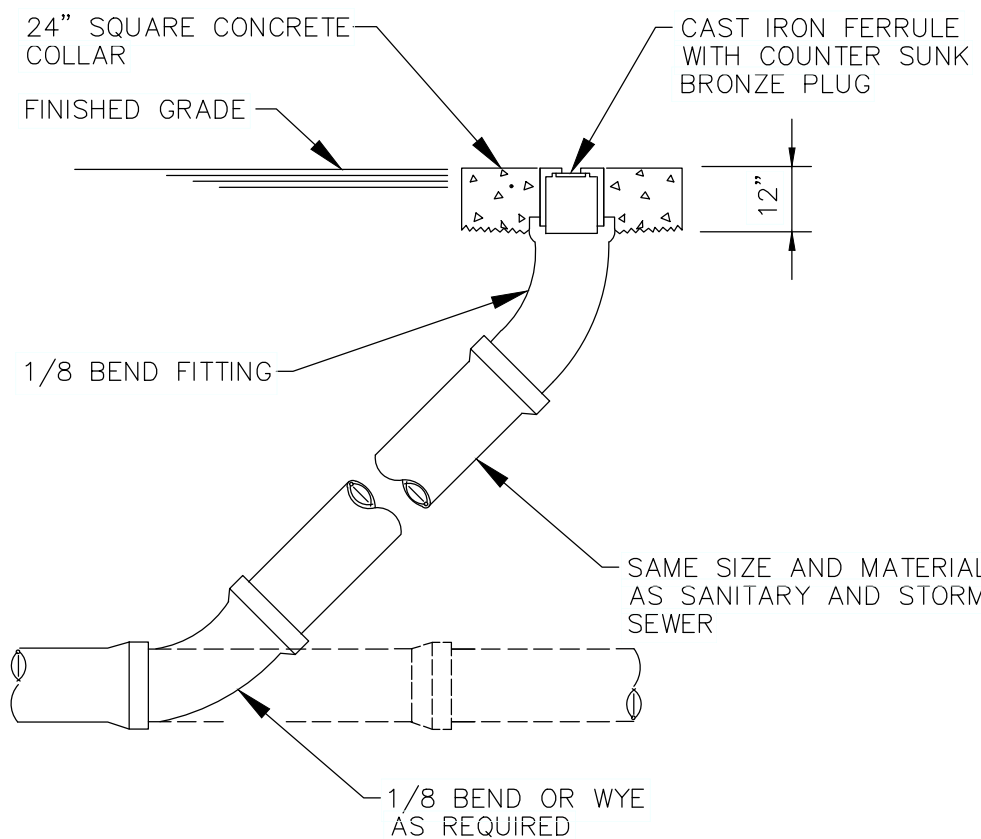




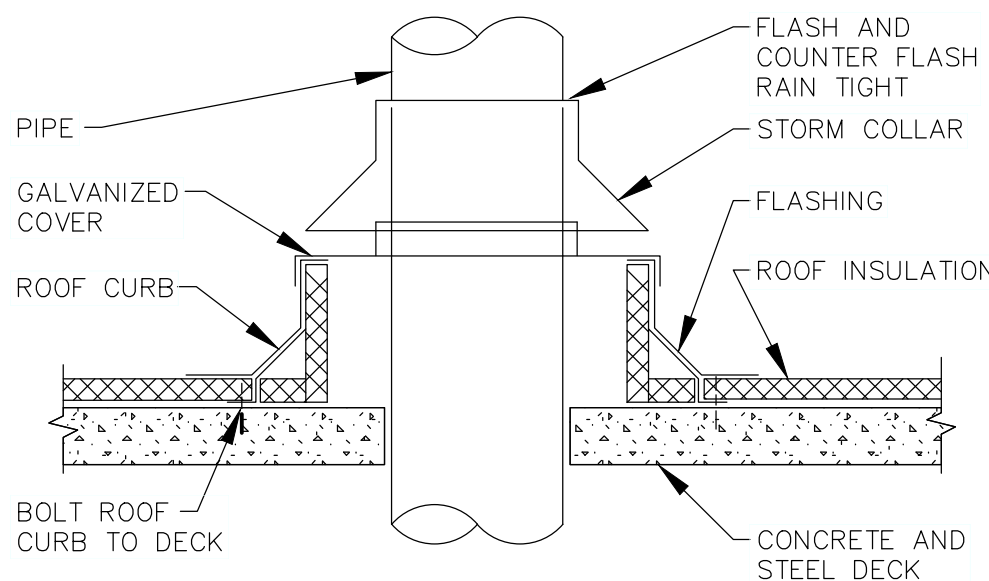
**WALL CLEANOUT DETAIL (WCO)**  
SCALE: NONE



**FLOOR CLEANOUT DETAIL (FCO)**  
SCALE: NONE

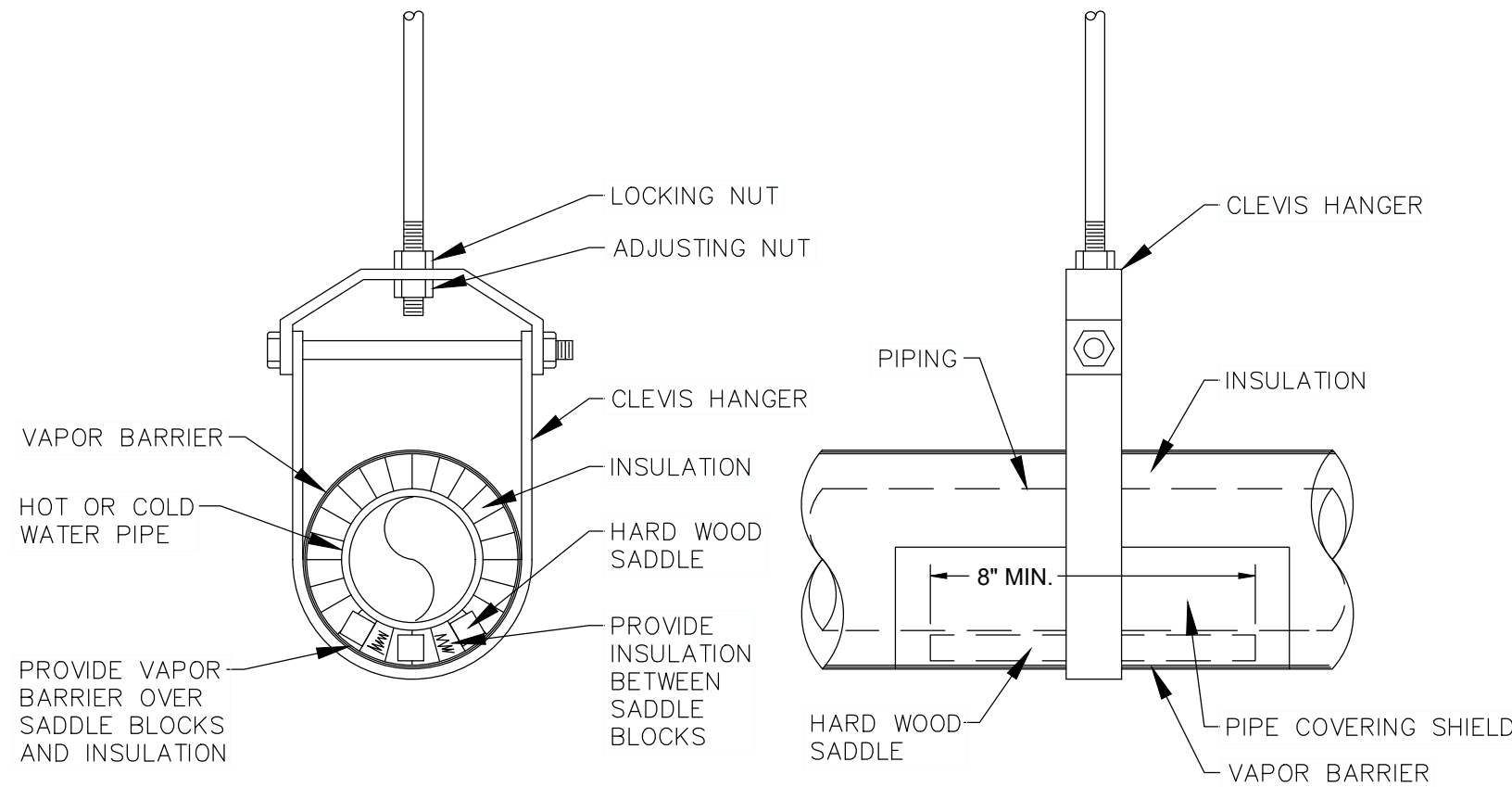


**TYPICAL YARD CLEANOUT (YCO)**  
SCALE: NONE



- NOTES:
- FLASHING SHALL BE PROVIDED AND INSTALLED PER ROOFING MANUFACTURERS RECOMMENDATIONS.
  - SEE STRUCTURAL DRAWINGS FOR ROOF OPENING.

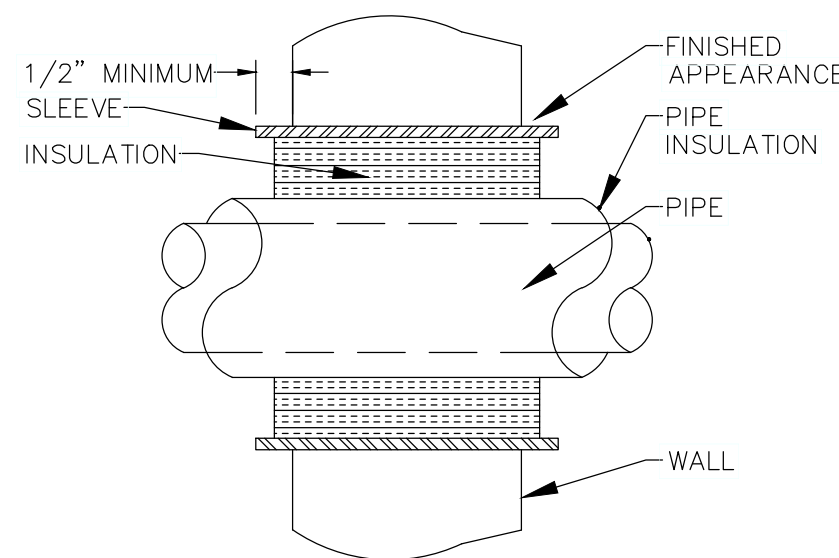
**PIPE ROOF PENETRATION DETAIL**  
SCALE: NONE



- NOTES:
- PROVIDE PIPE COVERING SHIELD AT EACH CLEVIS HANGER. INSTALL SHIELD BETWEEN VAPOR BARRIER AND CLEVIS HANGER.
  - THIS DETAIL IS TYPICAL FOR ALL OTHER HANGERS AND SUPPORTS.

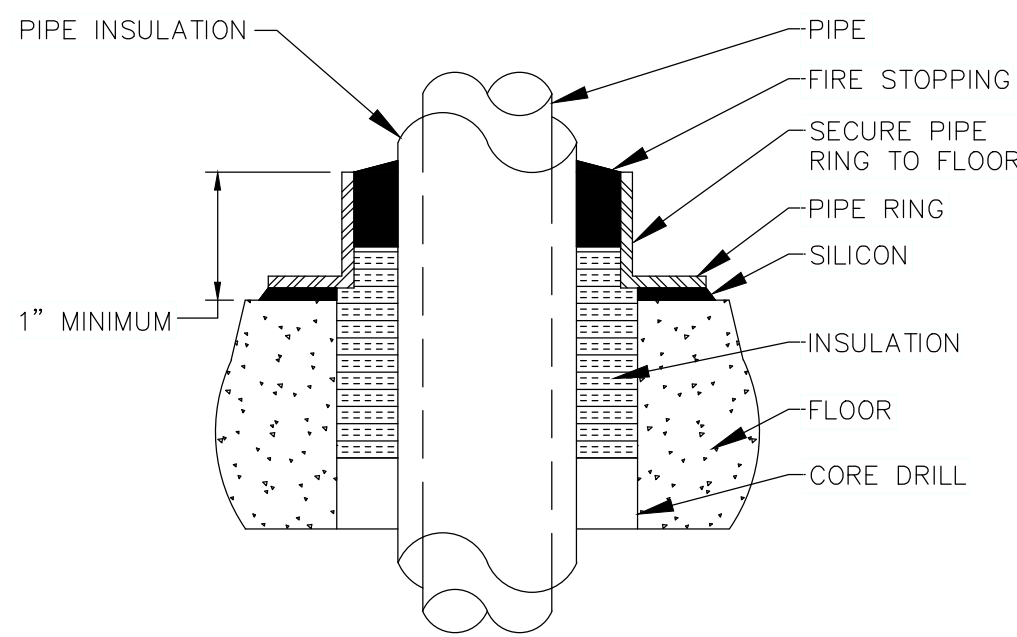
**TYPICAL INSULATED PIPE HANGER DETAIL**

SCALE: NONE



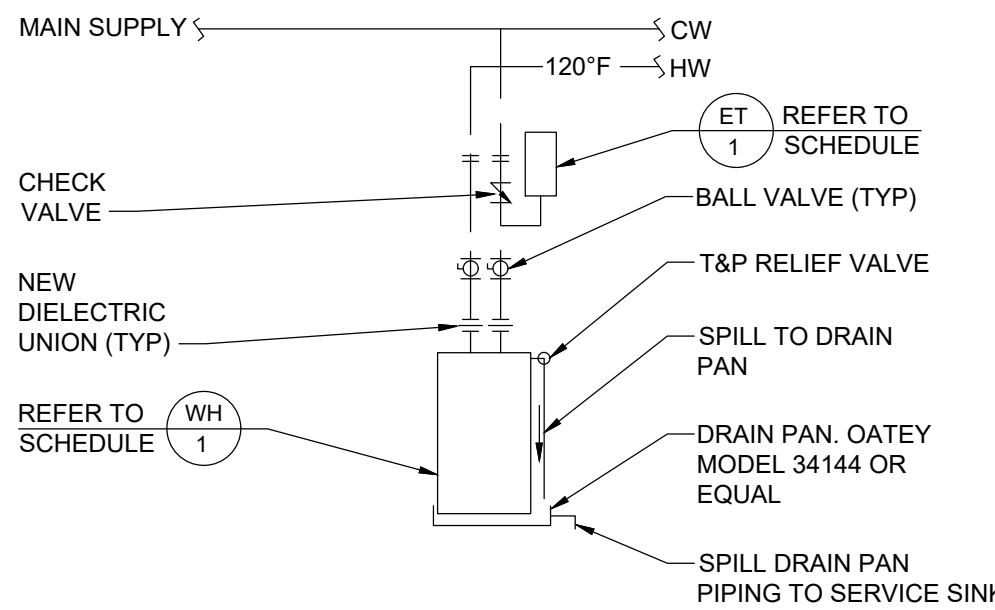
**INTERIOR NON-RATED WALL PIPE SLEEVE DETAIL**

SCALE: NONE



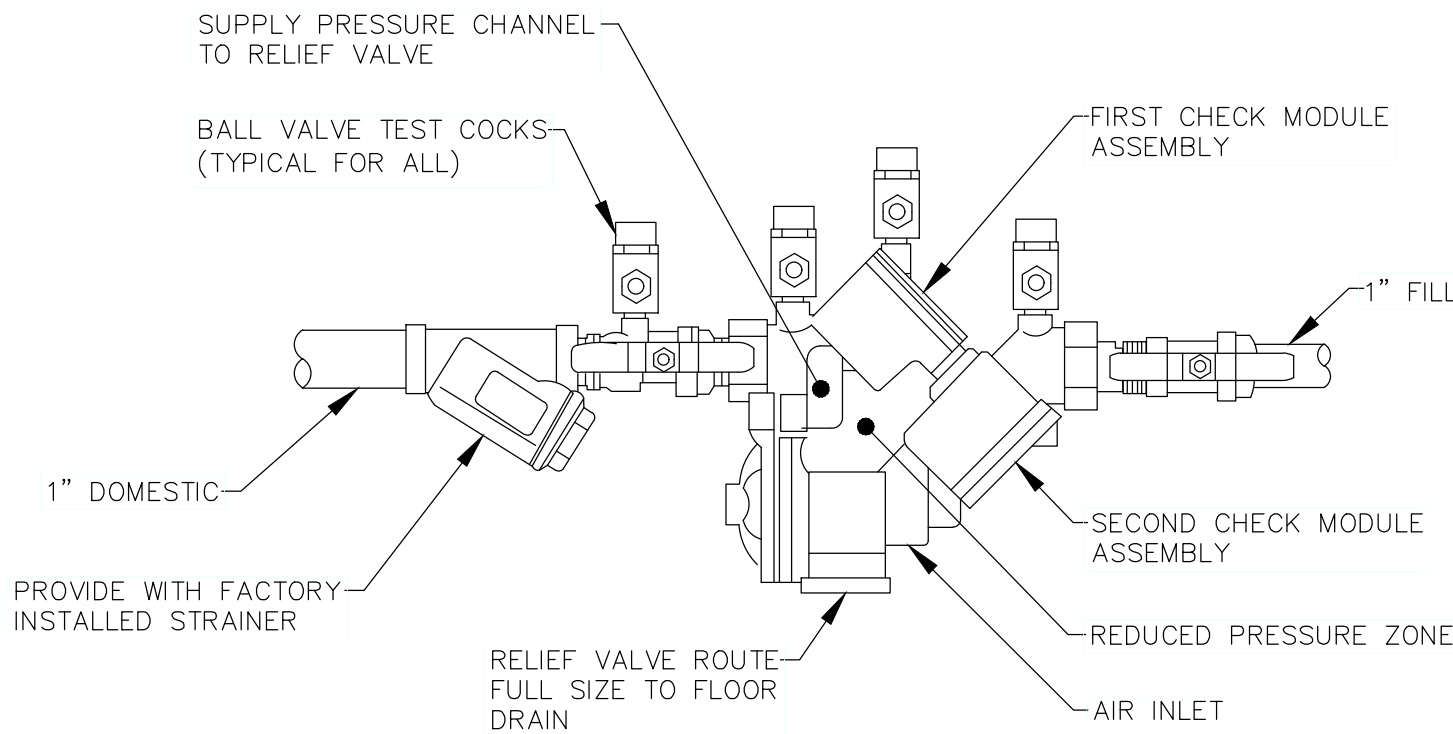
**FLOOR PIPE SLEEVE DETAIL**

SCALE: NONE



**ELECTRIC WATER HEATER DETAIL**

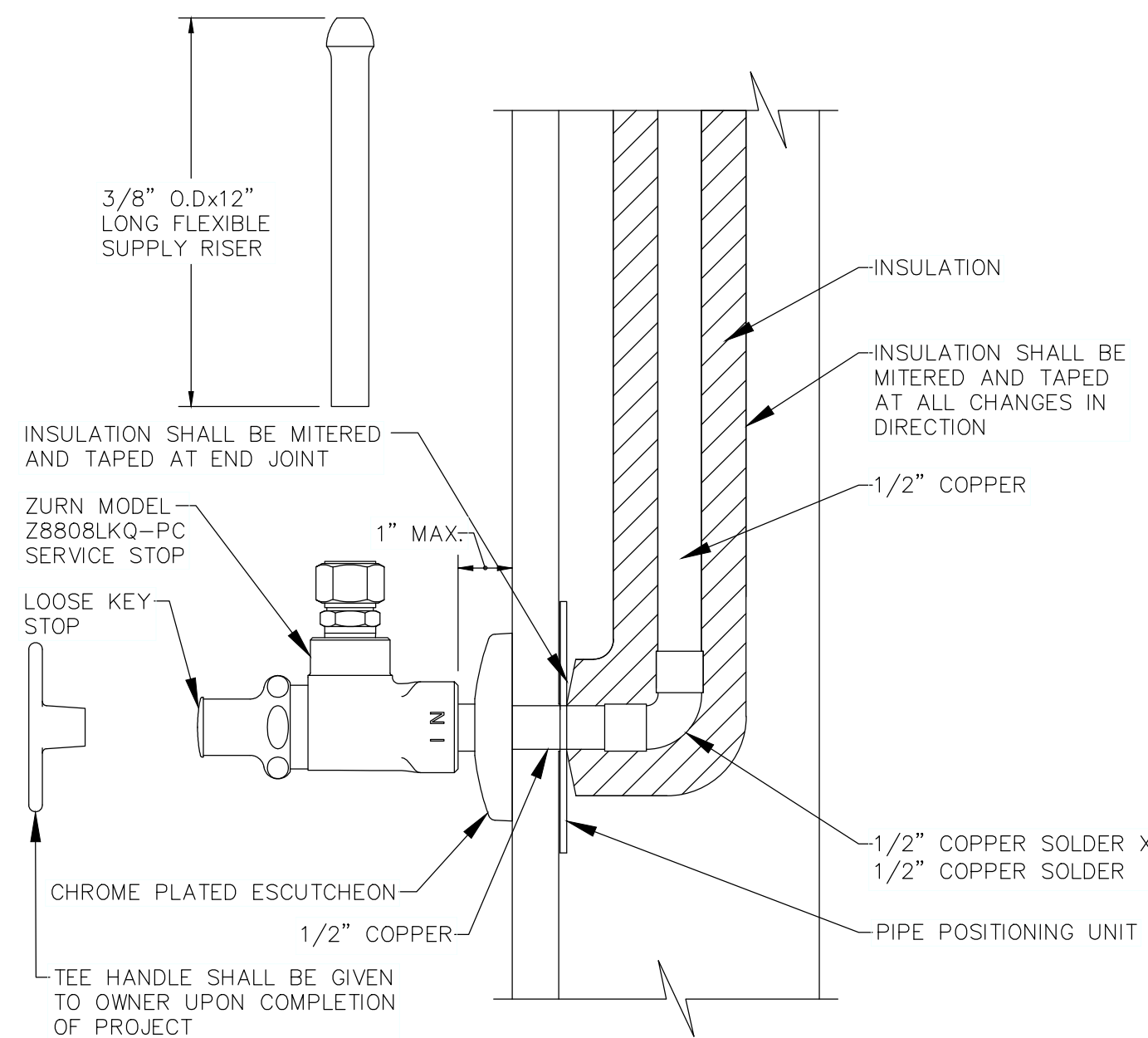
NO SCALE



**REDUCED PRESSURE BACKFLOW PREVENTER DETAIL**

SCALE: NONE

CONTRACTOR SHALL PROVIDE WATTS MODEL 909-QT-S. BACKFLOW PREVENTER SHALL BE WATTS, FEBCO, WILKINS, OR APPROVED EQUAL. CONTRACTOR SHALL COORDINATE INSTALLATION OF BACKFLOW PREVENTER WITH MECHANICAL CONTRACTOR.



**TYPICAL SERVICE STOP INSTALLATION DETAIL**

SCALE: NONE

DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
A&E FILE NO.	2019-24	DRAWING NO.	
DRAWING DATE:	05/11/2020	P002	
DRAWN BY:	TP	COMMONWEALTH OF KENTUCKY	
CHECKED BY:	JM	FINANCE AND ADMINISTRATION CABINET	
PHASE:	RTA	DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES	
RTA DATE:	5/11/2020	DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION	
STAMP:		FRANKFORT, KENTUCKY	
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STATE OF KENTUCKY JEFFREY E. MCBRIDE 28473 PROFESSIONAL ENGINEER		REVISION HISTORY OF THIS DRAWING	
		DESCRIPTION OF REVISIONS	DATE
		1	5
		2	6
		3	7
		4	8



SCHEDULE OF PLUMBING FIXTURES AND CONNECTIONS																						
MARK	FIXTURE	BASIS OF DESIGN MANUFACTURER	MODEL NO.	TYPE	MATERIAL	STYLE	FAUCET / VALVE				SUPPLY STOPS MANUFACTURER AND MODEL	DRAIN				DOMESTIC CW	DOMESTIC HW	DOMESTIC TW	SANITARY WASTE	SANITARY VENT	REMARKS	MARK
							MANUFACTURER & MODEL	SPOUT	HANDLES	CENTERS		TYPE	SIZE	P-TRAP	TAILPIECE							
<u>WC1</u> (ADA)	WATER CLOSET	MANSFIELD	137-160	FLOOR MOUNT TANK-TYPE	VITREOUS CHINA	A.D.A. ELONGATED SIPHON-JET	---	---	LEVER	---	---	---	---	---	---	½"	---	---	4"	2"	1.6 GALLON FLUSH. ELONGATED FRONT, SEAT AT ADA HEIGHT, ANTI-SIPHON BALLCOCK.	<u>WC1</u> (ADA)
<u>L1</u> (ADA)	LAVATORY	MANSFIELD	2018HBNS	ADA WALL-MOUNT	VITREOUS CHINA	---	ZURN MODEL Z631B4-XL	INTEGRAL WITH FAUCET	LEVER	4"	ZURN Z8804-XL -LK-Q-PC	ZURN Z8746-PC	1¼"	17 GAUGE 1¼" X 1½"	OFFSET	½"	½"	---	1½"	1½"	2.0 GPM. P-TRAP SHALL BE ADJUSTABLE CAST BRASS W CLEANOUT. PROVIDE ZURN Z8946-3-NT PROTECTIVE COVERINGS FOR ALL EXPOSED TAILPIECES, TRAP, SUPPLIES.	<u>L1</u> (ADA)
<u>S1</u>	SERVICE SINK	ZURN	Z5880	WALL MOUNT	ENAMELED CAST IRON	---	ZURN MODEL Z843M1	8" THREADED	LEVER	6"	ZURN Z8804-XL -LK-Q-PC	ZURN Z5900	2"	17 GAUGE 2"	OFFSET	¾"	¾"	---	2"	2"	STAINLESS STEEL RIM GUARD, WALL HANGER. SERVICE FAUCET WITH VACUUM BREAKER, PAIL HOOK AND WALL BRACE.SINK SHALL BE FITTED WITH EMERGENCY EYE WASH "EW1" - PROVIDE THREADED ADAPTOR AS REQUIRED. THERMOSTATIC MIXING VALVE FOR SCALD PREVENTION.	<u>S1</u>
<u>EW1</u>	EMERGENCY EYEWASH	GUARDIAN	G1201	FAUCET-MOUNT	CHROME	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5" OUTLET HEADS, PLASTIC COVERS, DIVERTER VALVE.	<u>EW1</u>
<u>YH1</u>	FREEZE-PROOF YARD HYDRANT	WOODFORD WATER	IOWA Y34	IN-GROUND	GALVANZIED STEEL	ADJUSTABLE LINK	---	---	---	---	---	---	---	---	---	¾"	---	---	---	---	ANTI-SIPHON, AUTOMATIC DRAINING, NON FREEZE WITH BACKFLOW PREVENTER.	<u>YH1</u>
NOTES: 1. PLUMBING CONTRACTOR SHALL PROVIDE AND INSTALL TRUE-BIO PRODUCTS, INC. "TRAP WRAP" KIT ON ALL EXPOSED LAVATORY OR SINK TRAPS AND SUPPLIES. KIT SHALL INCLUDE TAILPIECE, P-TRAP, WASTE ARM, HOT AND COLD WATER VALVES AND LINE COVERS. 2. PLUMBING FIXTURES AND TRIM SPECIFIED IN SCHEDULE ARE TO ESTABLISH A MINIMUM LEVEL OF QUALITY/PERFORMANCE. OTHER MANUFACTURER'S MAY BE CONSIDERED EQUAL IN QUALITY AND FUNCTION. DIFFERING MANUFACTURER'S MAY BE SUBMITTED AS PART OF A BID PACKAGE, WITH WRITTEN APPROVAL FROM ARCHITECT AND/OR ENGINEER, IF APPROVALS ARE OBTAINED TEN (10) DAYS BEFORE BIDS ARE DUE. 3. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHTS OF PLUMBING FIXTURES. 4. UNLESS NOTED OTHERWISE, PLUMBING FIXTURE COLORS SHALL BE SELECTED FROM FACTORY-STANDARD FINISHED - COLOR/FINISH SELECTION BY ARCHITECT. 5. PLUMBING CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY HANGERS, SUPPORTS, ETC. TO MEET MANUFACTURER'S INSTALLATION REQUIREMENTS AND TO LEAVE THE OWNER WITH A COMPLETE AND FULLY FUNCTIONAL PLUMBING SYSTEM.																						

SCHEDULE OF DOMESTIC WATER HEATERS									
MARK	MANUFACTURER	MODEL NO.	TANK CAPACITY (GALLONS)	RECOVERY @ 100 °F TEMPERATURE RISE	KW INPUT	HOT WATER TEMP OUT	EFFICIENCY	REMARKS	MARK
<u>WH1</u>	A.O. SMITH	DEL-10	10	10.0 GPH	2.5	140	---	SEE BELOW	<u>WH1</u>
NOTES: 1. FUEL SOURCE SHALL BE ELECTRIC. 2. PROVIDE ASME RATED RELIEF VALVE FOR WATER HEATER. 3. PROVIDE ALL REQUIRED CLEARANCES AROUND WATER HEATER. CONTRACTOR SHALL VERIFY WATER HEATER WILL FIT IN ALLOTTED SPACE. 4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL STATE FORMS, SUBMITTALS, FEES, PERMITS, ETC. AS REQUIRED FOR WATER HEATER INSTALLATION. 5. BASIS OF DESIGN IS INDICATED IN SCHEDULE, REFER TO SPECIFICATIONS FOR OTHER APPROVED MANUFACTURERS. EQUIPMENT MUST MEET ALL THE PERFORMANCE REQUIREMENTS INDICATED									

SCHEDULE OF PLUMBING DRAINS AND CLEANOUTS								
MARK	FIXTURE	MANUFACTURER	MODEL NUMBER	TYPE	MATERIAL	STYLE	DRAIN SIZE	REMARKS
<u>ECO</u>	CLEANOUT	ZURN	ZN1400-VP	NO HUB OR NEO-LOCK	CAST IRON / NICKEL BRONZE TOP	SCORIATED ROUND TOP	PER DWGS.	VANDAL RESISTANT SECURED TOP. PROVIDE NICKEL BRONZE TOP IN FINISHED AREAS, BRONZE TOP IN UNFINISHED.
<u>WCO</u>	WALL CLEANOUT	ZURN	Z1446	NO HUB OR NEO-LOCK	CAST IRON / STAINLESS STEEL COVER	ROUND COVER	PER DWGS.	

PLUMBING INSULATION							
FLUID OPERATING TEMPERATURE, DEG. F	CONDUCTIVITY, BUT*IN / (HR-F2°F)	MEAN RATING TEMP, DEG. F	NOMINAL PIPE OR TUBE SIZE, INCHES				
			<1"	1" TO <1-1/2"	1-1/2" TO <4"	4" TO <8"	>8"
			MINIMUM INSULATION THICKNESS, INCHES				
105-140 DEG. F	0.22-0.28	100	1.0	1.0	1.5	1.5	1.5
141-200 DEG. F	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
NOTES:							
1. EXPOSED PIPING SUBJECT TO DAMAGE SHALL BE PROVIDED WITH PROTECTIVE CLADDING/SHEATHING – CONFIRM LOCATIONS WITH OWNER.							
2. FIBERGLASS INSULATION SHALL BE PROVIDED WITH ASJ.							

SOIL AND WASTE PIPE SIZING, FIXTURE UNITS ON A SINGLE STACK (KPC)		
PIPE SIZE, INCHES	MAXIMUM DEVELOPED LENGTH	FIXTURE UNITS
1-1/4	25 FEET	1
1-1/2	60 FEET	2
2	80 FEET	6
2-1/2	100 FEET	12
3	225 FEET	36
1. WATER CLOSET SHALL BE ON A MINIMUM OF A THREE (3) INCH SOIL AND WASTE PIPE WITH A MAXIMUM OF THREE (3) WATER CLOSETS OR SOIL DISCHARGING FIXTURES PER THREE (3) INCH SOIL AND WASTE PIPE.  2. FOUR (4) WATER CLOSETS WITH A MAXIMUM FLUSHING RATE OF 1.6 GALLONS PER FLUSH PER WATER CLOSET SHALL BE ALLOWED TO DISCHARGE INTO A THREE (3) SOIL AND WASTE PIPE.		

MINIMUM AIR GAP FOR PLUMBING FIXTURES (KPC)		
FIXTURE	MINIMUM AIR GAP	
	WHEN NOT AFFECTED BY NEAR WALL, INCHES	WHEN AFFECTED BY NEAR WALL, INCHES
LAVATORIES AND OTHER FIXTURES WITH EFFECTIVE OPENING NOT GREATER THAN 1/2" DIAMETER	1	1-1/2
SINK, LAUNDRY TRAYS, GOOSENECK BATH FAUCETS AND OTHER FIXTURES WITH EFFECTIVE OPENINGS NOT GREATER THAN 3/4" DIAMETER	1-1/2	2-1/4
OVER RIM BATH FILLERS AND OTHER FIXTURES WITH EFFECTIVE OPENINGS NOT GREATER THAN 1" DIAMETER	2	3
DRINKING FOUNTAINS - SINGLE ORIFICE NOT GREATER THAN 7/16" DIAMETER OR HAVING MULTIPLE ORIFICES HAVING TOTAL AREA OF 0.15 SQ. INCHES	1	1-1/2
EFFECTIVE OPENINGS GREATER THAN 1 INCH	2 X DIAMETER OF EFFECTIVE OPENING	3 X DIAMETER OF EFFECTIVE OPENING

SCHEDULE OF DOMESTIC WATER EXPANSION TANKS						
MARK	MANUFACTURER	MODEL NO.	TANK CAPACITY (GALLONS)	ACCEPTANCE VOLUME (GALLONS)	REMARKS	MARK
<u>ET1</u>	A.O. SMITH	PMC-2	2.1	1.27	ALL	<u>ET1</u>
<u>ET2</u>	A.O. SMITH	PMC-2	2.1	1.27	ALL	<u>ET2</u>
NOTES: 1. ASME RATED - 150 PSIG PRESSURE RATING. 2. 200 DEG. F MAXIMUM ALLOWABLE WORKING TEMPERATURE. 3. 40 PSIG STANDARD FACTORY PRECHARGE.						

MINIMUM WATER SUPPLY PIPING SIZES (KPC)	
FIXTURE BRANCHES	NOMINAL PIPE SIZING, INCHES
LAVATORY	1/2"
SINKS (SERVICE, SLOP)	3/4"
WATER CLOSET (TANK TYPE)	1/2"
HOT WATER HEATERS	3/4"
WALL HYDRANT	1/2"
1. IF THE EQUIPMENT/FIXTURE MANUFACTURER REQUIRES OR RECOMMENDS LARGER PIPING FOR THEIR PARTICULAR ITEM, THEN THE LARGER PIPE SIZE SHALL BE PROVIDED.  2. MORE THAN THREE (3) 1/2" FIXTURE BRANCHES SHALL NOT BE SUPPLIED FROM A 1/2" PIPE.  3. THE BRANCH PIPE TO A FIXTURE SHALL TERMINATE NOT MORE THAN THIRTY (30) INCHES FROM THE POINT OF CONNECTION TO THE FIXTURE AND SHALL BE BROUGHT TO THE FLOOR OR WALL ADJACENT TO THE FIXTURE.  4. ANY CONCEALED WATER BRANCH PIPING SHALL NOT BE LESS THAN 1/2" NOMINAL PIPE SIZE.  5. WATER HAMMER:  5.1. IN A BUILDING SUPPLY SYSTEM IN WHICH A DEVICE OR APPURTENANCE IS INSTALLED UTILIZING A QUICK ACTING VALVE THAT CAUSES NOISE DUE TO WATER HAMMER, A PROTECTIVE DEVICE, INCLUDING AN AIR CHAMBER OR APPROVED MECHANICAL SHOCK ABSORBER, SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE QUICK ACTING VALVE CAUSING THE WATER HAMMER.  5.2. IF A MECHANICAL SHOCK ABSORBER IS INSTALL, IT SHALL BE IN AN ACCESSIBLE PLACE. FOLLOW MFR'S INSTALLATION INSTRUCTIONS.	

MAXIMUM DISTANCE FROM TRAP TO VENT (KPC)	
SIZE OF FIXTURE DRAIN, INCHES	DISTANCE FROM TRAP TO VENT, FEET
1-1/4	2'-6"
1-1/4	3'-6"
2	5'-0"
3	6'-0"
4	10'-0"
A FIXTURE BRANCH ON A WATER CLOSET SHALL NOT BE MORE THAN 4'-6".	

MINIMUM SIZING FOR TRAPS, SOIL AND WASTE BRANCH PIPING (KPC)			
FIXTURE	MINIMUM SIZE, INCHES		
	TRAP	BRANCH	FIXTURE UNITS
LAVATORIES	1-1/4	1-1/4	1
SINKS: SERVICE	3	3	3
SINKS: SERVICE, WALL TYPE	2	2	2
WATER CLOSET:3.5 GPM/FLUSH	3	3 OR 4	6
WATER CLOSET:1.6 GPM/FLUSH	3	3 OR 4	4

CRITICAL LEVEL (CL) SETTINGS FOR ATMOSPHERIC-TYPE VACUUM BREAKERS (KPC)	
FIXTURE OR EQUIPMENT	METHOD OF INSTALLATION
ON MODELS WITH BUILT-IN VACUUM BREAKERS:	
HOSE BIBBS	CL AT LEAST 6" ABOVE FLOOD LEVEL OF RECEPTACLE SERVED
HOSE OUTLETS	CL AT LEAST 6" ABOVE HIGHEST POINT ON HOSE LINE

MAXIMUM PERMISSIBLE VENT LENGTH (KPC)		
PIPE SIZE, INCHES	MAXIMUM LENGTH	FIXTURE UNITS
1-1/4	30 FEET	2
1-1/2	150 FEET	10
2	200 FEET	24
2-1/2	250 FEET	36
3	300 FEET	72
4	400 FEET	240
EXCEPT FOR RESIDENTIAL INSTALLATIONS, IF A FIXTURE OPENING IS INSTALLED MORE THAN TWENTY-FIVE (25) FEET OF DEVELOPED LENGTH FROM THE POINT WHERE IT IS CONNECTED TO THE MAIN SOIL OR WASTE SYSTEM, OR IF MORE THAN TEN (10) FEET OF VERTICAL PIPING IS USED, THE VENT SHALL BE CONTINUED FULL SIZE THROUGH THE ROOF OR RETURNED FULL SIZE TO THE MAIN VENT.		

DRAWING INFORMATION	FFA CABIN, SHOP & MISC. CONSTRUCTION			
	A&E FILE NO.	2019-24	PLUMBING SCHEDULES	
DRAWN BY: TP CHECKED BY: JM PHASE RTA RTA DATE: 5/11/2020 STAMP:	DRAWING DATE: 05/11/2020		DRAWING NO. P003	
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	10109 Headley Hill RD Louisville, KY 40223 502-541-5352		DECA REVIEWED	
	FOR INTENT ONLY DECA LOG # A1C-6923			
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	DESCRIPTION OF REVISIONS		DATE	DATE
	1		5	
	2		6	
	3		7	
	4		8	



MECHANICAL GENERAL NOTES

GENERAL PROJECT REQUIREMENTS

- A. ALL MATERIALS FURNISHED AND ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED CODES, RULES AND REGULATIONS, INCLUDING BUT NOT LIMITED TO: MECHANICAL, ELECTRICAL, PLUMBING, ENERGY CONSERVATION, BUILDING, NFPA, ASHRAE 62.1 & 90.1, OSHA, UTILITY PROVIDERS, AS WELL AS ALL LOCAL AND STATE CODES. IN ALL CASES, THE MOST STRINGENT SHALL APPLY.
- B. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES, PERMITS AND LICENSES FOR THE COMPLETE INSTALLATION OF HIS WORK. DRAWINGS ARE DIAGRAMMATIC REPRESENTATION OF THE WORK AND INDICATES GENERAL ARRANGEMENT. SEE ARCHITECTURAL AND/OR FOOD SERVICE DRAWINGS FOR EXACT DIMENSIONS.
- C. COORDINATE EXACT PHASING OF ALL WORK WITH GENERAL CONTRACTOR. PREPARE SHOP DRAWINGS TO VERIFY COORDINATION OF WORK BETWEEN TRADES, PRIOR TO INSTALLATION OR PURCHASE OF MATERIAL.
- D. INSTALL EQUIPMENT, MATERIALS, ETC., IN STRICT ACCORD WITH MANUFACTURERS' RECOMMENDATIONS AND DIRECTIONS. ALL INSTALLED COMPONENTS/EQUIPMENT SHALL BE LABELED BY UNDERWRITERS' LABORATORIES OR OTHER APPROVED LISTING AGENCY. APPROVED AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT, UNLESS WAIVED BY THE ENGINEER IN WRITING.
- E. ALL ROOF VENTS, DRAINS, CURBS, PIPE PORTALS, ETC. SHALL BE COMPATIBLE WITH THE ROOFING SYSTEM (EITHER EXISTING OR NEW). SEE ARCHITECTURAL PLANS/SPECIFICATIONS FOR MORE INFORMATION. COORDINATE ALL ROOF ACCESSORIES WITH G.C.
- F. ALL SUPPORTS FOR EQUIPMENT, DEVICES OR FIXTURES SHALL BE UNIQUE, FROM THE BUILDING STRUCTURE. DO NOT SUPPORT WORK FROM OTHER TRADES, EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER AND CONSENT OF THE OTHER TRADE, IN WRITING. SUPPORTING FROM CROSS BRACING OR ROOF DECK WILL NOT BE ALLOWED.
- G. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR HIS WORK. ALL CUTTING AND PATCHING SHALL BE IN ACCORDANCE WITH THE ARCHITECTS STANDARDS FOR SUCH WORK. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. IF IN DOUBT, CONTACT THE OWNER/ARCHITECT AND ENGINEERS FOR CLARIFICATIONS PRIOR TO INSTALLING ANY SUCH WORK.
- H. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. ANY EXPOSED WORK THAT COULD PRESENT AN ENVIRONMENTAL HAZARD (E.G. CONTACT WITH STEAM PIPING, EXPOSED DUCT JOINTS IN A LOW CEILING) SHALL BE PROVIDED WITH ALL REQUIRED PROTECTIVE MEASURES.
- I. DO NOT SCALE FROM DRAWINGS, AS PRINTING DISTORTS SCALE. WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONS SUPPLIED TO THE CONTRACTOR.
- J. THE PURPOSE AND INTENT OF ALL OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, SAFE, LIKE NEW FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE. FURNISH ALL REQUIRED ITEMS EVEN IF NOT SPECIFICALLY SHOWN ON THE DRAWINGS (E.G. OFFSETS, ISOLATION AND BALANCING DEVICES, MAINTENANCE CLEARANCES, ETC.) ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ENGINEER.
- K. MAINTAIN ALL MANUFACTURER AND CODE-REQUIRED SERVICE CLEARANCES, INTAKE/EXHAUST CLEARANCES, ROOF EDGE CLEARANCES FOR ALL NEW AND EXISTING EQUIPMENT, DUCTWORK AND PLUMBING VENTS.

EXISTING CONDITIONS AND UTILITIES

- A. CONTRACTOR SHALL VISIT AND EXAMINE THE SITE PRIOR TO SUBMITTING BID TO BECOME FAMILIAR WITH EXISTING CONDITIONS. NO ALLOWANCE SHALL BE MADE FOR EXISTING CONDITIONS NOT KNOWN TO THE CONTRACTOR. EXISTING EQUIPMENT, DUCT/PIPING (SIZES AND LOCATIONS), ETC. ARE SHOWN FOR REFERENCE ONLY. ADJUST EXACT INSTALLATION AND CONNECTION OF NEW ITEMS ACCORDING TO FIELD CONDITIONS.
- B. CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING BUILDING SERVICES. FOR SAFETY PURPOSES, PARTICULAR ATTENTION SHALL BE PAID TO THIS PRECAUTION RELATIVE TO STEAM, WASTE, HYDRONIC PIPING, NATURAL GAS AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, TYPE, ETC., OF EACH UNDERGROUND OR OVERHEAD UTILITY.
- C. CARE SHALL BE TAKEN BY ALL CONTRACTORS TO AVOID DAMAGING OR DISTURBING EXISTING CONSTRUCTION WHICH IS TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ANY REPAIRS NECESSARY TO RECTIFY DAMAGE AND RESTORE EXISTING CONSTRUCTION TO AN UNDAMAGED STATE UPON COMPLETION OF WORK - THIS SHALL BE PERFORMED AT NO ADDITIONAL COST TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING/PATCHING ANY ABANDONED PENETRATIONS, UNLESS DIRECTED OTHERWISE BY OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR STORAGE OF RELOCATED/RETAINED EQUIPMENT AND MATERIALS DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.
- D. INTERRUPTION OF ANY EXISTING SERVICES SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR, UTILITY PROVIDER, OWNER'S DESIGNATED REPRESENTATIVE, AND THE ARCHITECT. AT LEAST TWO WEEKS IN ADVANCE OF THE ANTICIPATED INTERRUPTION, A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED, TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED TWO WEEKS IN ADVANCE, IN WRITING. IF UTILITY COMPANY REQUIRES A LONGER NOTIFICATION PERIOD, SO PROVIDE. WHERE INTERRUPTING AN EXISTING UTILITY OR SERVICE DELIBERATELY OR ACCIDENTALLY, THE RESPONSIBLE CONTRACTOR SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME, PROVIDING PREMIUM TIME AS NEEDED.
- E. CONTRACTOR SHALL BE RESPONSIBLE, FOR NOTIFYING OWNER/ARCHITECT AND ENGINEER OF ANY AND ALL HAZARDOUS MATERIAL ABATEMENT (LEAD, ASBESTOS, ETC.) REQUIRED FOR DEMOLITION AND/OR NEW WORK. IF ANY HAZARDOUS MATERIALS ARE FOUND, THESE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF OWNER/G.C. IMMEDIATELY AFTER DISCOVERY. ABATEMENT WORK WILL BE COVERED UNDER A SEPARATE CONTRACT.

COORDINATION WITH FIRE ALARM AND FIRE/SMOKE-RATED ASSEMBLIES

- A. PROVIDE FIRE STOP PER BUILDING CODE TO ALL CONDUITS PENETRATING THROUGH FIRE RATED WALLS/PARTITION, FLOORS AND CEILINGS. COORDINATION WITH THE GENERAL CONTRACTOR SHALL BE MAINTAINED TO INSURE THAT FIRE STOPPING IS APPROVED U.L. OR EQUIVALENT SEALANT. CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING/PATCHING ANY PENETRATIONS IN FLOOR/SLAB/WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL PLANS FOR WALL RATINGS.
- B. MECHANICAL CONTRACTOR SHALL PROVIDE FIRE, SMOKE, OR COMBINATION DAMPERS, AS REQUIRED, TO MEET DESIGNATED RATINGS FOR ALL RATED BUILDING ASSEMBLIES, AND/OR AS SHOWN ON PLANS.
- C. PROVIDE CEILING AND WALL-MOUNTED AIR DEVICES WITH RADIATION DAMPERS, AS REQUIRED TO MEET ASSEMBLY FIRE/SMOKE RATINGS, AND/OR AS SHOWN ON PLANS.

COORDINATION WITH OTHER TRADES

- A. MECHANICAL CONTRACTOR SHALL VERIFY EXACT MOUNTING LOCATION AND CONNECTION REQUIREMENTS OF ALL PLUMBING/MECHANICAL/FOOD SERVICE EQUIPMENT WITH ALL OTHER INVOLVED TRADES PRIOR TO ROUGH-IN.
- B. CONTRACTOR SHALL COORDINATE LOCATION OF GRILLES/REGISTERS/DIFFUSERS, DUCTWORK, PIPING, ETC. WITH ALL OTHER TRADES TO AVOID CONFLICT WITH CONDUIT, LIGHTING, DUCTWORK, CABLE TRAYS, PIPING AND SPRINKLER PIPING, ETC.
- C. ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT SHALL BE WEATHERPROOF TYPE NEMA 3R. COORDINATE INSTALLATION WITH ELECTRICAL CONTRACTOR.
- D. REFER TO ARCHITECTURAL WALL ELEVATIONS (WHERE GIVEN) FOR HEIGHTS AND MOUNTING RELATIONSHIP OF AIR DEVICES, ACCESS PANELS, THERMOSTATS AND OTHER SENSORS, ETC. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEMS, CONTACT THE ARCHITECT AND ENGINEER PRIOR TO INSTALLATION. IF APPLICABLE, REFER TO ARCHITECTURAL WALL ELEVATIONS, CEILING HEIGHTS, REFLECTED CEILING PLAN, AND OTHER DETAILS IN THESE DOCUMENTS (AS APPLICABLE).
- E. WHERE PENETRATING NEW OR EXISTING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. ROOFING CONTRACTOR SHALL MAKE ALL ROOF PENETRATIONS.
- F. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL/FIRE ALARM CONTRACTOR FOR PROVISION OF POWER WIRING, DISCONNECTS, SMOKE DETECTORS, INTERRUPTERS, CONTACTS, ETC.

MECHANICAL WORK

- A. ALL VALVES, DAMPERS, SENSORS, OPERATORS, DEVICES, CLEAN OUTS, ETC. SHALL BE ACCESSIBLE. PROVIDE ACCESS PANEL(S) AS REQUIRED WITH PRIOR APPROVAL OF ARCHITECT.
- B. CONTROLS AND OTHER LOW VOLTAGE WIRING SHALL BE PLENUM RATED IF CONDUCTORS PASS THROUGH AN AIR PLENUM.
- C. ALL STRUCTURAL SUPPORTS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL INCLUDE DESIGN FOR ALL STRUCTURAL SUPPORT.
- D. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BALANCING ALL DUCT, PIPING, EQUIPMENT, TERMINAL DEVICES, AND ANY OTHER APPURTENANCES OF THE BUILDING'S MECHANICAL/PLUMBING SYSTEMS ACCORDING TO AABC/NEBB PROCEDURES AND PROVIDE TEST AND BALANCE REPORT TO ENGINEER. TEST AND BALANCE SERVICES AND REPORT BY CONTRACTOR-HIRED THIRD PARTY BALANCING CONTRACTOR.
- E. MECHANICAL CONTRACTOR SHALL PROVIDE PIPING/DUCT SLEEVES FOR UTILITY ROUTING, AS NECESSARY, IN WALLS, FLOORS AND CEILINGS.
- F. MECHANICAL CONTRACTOR SHALL PROVIDE FIRE, SMOKE, OR COMBINATION DAMPERS, AS REQUIRED, IN ALL RATED BUILDING ASSEMBLIES.
- G. ALL PIPING/DUCT SYSTEMS SHALL BE INSTALLED WITH A MINIMUM OF FITTINGS, BENDS, POINTS OF CONSTRICTION, ETC. ALL PIPING SHALL BE INSTALLED AT RIGHT ANGLES, WITH LONG-SWEEP ELBOWS. PROVIDE PIPING WITH EXPANSION LOOPS AND APPROPRIATE HANGERS/SUPPORTS.
- H. PROVIDE GAS-FIRED EQUIPMENT WITH DUST/DRIP LEG, SHUT-OFF VALVE(S), REGULATOR, EMERGENCY SHUT-OFF SWITCH, EARTH-QUAKE SWITCH AND ANY OTHER ACCESSORIES AS DICTATED BY THE CONSTRUCTION DOCUMENTS AND ANY APPLICABLE CODES OR SAFETY STANDARDS.
- I. CEILING-MOUNTED AIR DISTRIBUTION DEVICES SHALL BE CENTERED IN 2' X 2' CEILING TILE AND INSTALLED CENTERED ON 2' DIMENSION OF 2' X 4' TILE AND ON CENTERLINE OR A QUARTER POINT ON 4' DIMENSION, AS INDICATED.
- J. INSTALL NO PIPING, CONDUIT, DUCTWORK, ETC., IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING AND THE COLLECTION OF CONDENSATION THEREON.
- K. UNLESS OTHERWISE DIRECTED BY THE OWNER, ALL NEW EQUIPMENT, SENSORS, CONTROLLERS, ETC. SHALL BE FULLY INTEGRATED AND INTEROPERABLE WITH EXISTING CONTROLS SYSTEM.
- L. UNLESS OTHERWISE NOTED, ALL AIR DEVICES NOT SHOWN AS A FULL CEILING GRID (I.E. 24" X 24") SHALL BE A MINIMUM OF 12" X 12".
- M. UNLESS OTHERWISE NOTED, ALL AIR DEVICES SHALL HAVE FACTORY-STANDARD WHITE ENAMEL FINISH. OWNER/ARCHITECT TO CONFIRM COLOR.
- N. ALL ELBOWS IN DUCTWORK SHALL BE LONG RADIUS. RECTANGULAR ELBOWS SHALL BE PROVIDED WITH TURNING VANES.
- O. MANUAL BALANCING DAMPERS SHALL BE PROVIDED FOR ALL SUPPLY, EXHAUST AND RETURN AIR BRANCH DUCTWORK. DAMPERS SHALL BE LOCATED AS FAR AWAY FROM AIR TERMINAL DEVICE AS IS PRACTICAL, BUT MUST BE LOCATED WITHIN THE SAME ROOM (UNLESS DIRECTED OTHERWISE).
- P. ALL DUCT AND PIPING RUNS ARE REPRESENTATIVE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CONDITIONS IN THE FIELD (EXISTING, OR PREDICATED BY NEW CONSTRUCTION) THAT MAKE NECESSARY ALTERNATE ROUTING OF DUCT/PIPING.
- Q. ALL PIPING EXPOSED TO THE OUTDOORS SHALL BE PROVIDED WITH HEAT TAPE - MINIMUM OF EIGHT (8) WATTS PER LINEAR FOOT. COORDINATE POWER WITH ELECTRICAL CONTRACTOR.

DUCTLESS SPLIT SYSTEM SCHEDULE (INDOOR UNIT)

MARK	TYPE	AIRFLOW, CFM	ESP. IN W.G.	SENS. COOLING, BTUH	TOTAL COOLING, BTUH	HEATING CAPACITY, BTUH	BASIS OF DESIGN MANUFACTURER	MODEL NO.	SEER	MCA	MOCP	ELECTRICAL	REMARKS
CCU-101	CEILING CASSETTE	315	N/A	14,100	—	11,900 @ 17 DEG 8,900 @ 5 DEG	DAIKIN	NTXCK5	19.8	0.4	—	208 / 1 PH	ALL
CCU-102	CEILING CASSETTE	315	N/A	14,100	—	11,900 @ 17 DEG 8,900 @ 5 DEG	DAIKIN	NTXCK5	19.8	0.4	—	208 / 1 PH	ALL
REMARKS: 1. ALL UNIT COMPONENTS, INCLUDING MOTORS SHALL MEET LATEST APPLICABLE ENERGY EFFICIENCY REQUIREMENTS. ALL EQUIPMENT SHALL BE UL-LISTED. 2. PROVIDE MANUFACTURER'S REQUIRED LINE SIZES BASED UPON DISTANCE BETWEEN OUTDOOR UNIT AND INDOOR UNIT. SEE MFG.'S PUBLISHED LITERATURE FOR MORE INFORMATION AND INSTALLATION/SIZING REQUIREMENTS. 3. THERMAL OVERLOAD PROTECTION; UNIT-MOUNTED SERVICE/DISCONNECT SWITCH; ANTI SHORT-CYCLE PROTECTION; LOW-VOLTAGE TRANSFORMERS AS REQUIRED. 4. EACH UNIT SHALL BE PROVIDED WITH A WALL-MOUNTED THERMOSTAT. SEE PLANS FOR MORE INFORMATION - COORDINATE FINAL LOCATION WITH OWNER/ARCHITECT. 5. UNLESS OTHER APPROVED, UNITS SHALL HAVE ALL SERVICE ACCESS ON ONE SIDE. CONTRACTOR SHALL COORDINATE LOCATION OF UNITS WITH RESPECT TO OTHER UTILITIES AND BUILDING ELEMENTS TO ENSURE ADEQUATE SERVICE CLEARANCES ARE PROVIDED. 6. LOW-AMBIENT OPERATION. IN EXTREME ENVIRONMENTS (E.G. THOSE WITH ALTITUDES AND/OR DESIGN TEMPERATURES OUTSIDE OF MANUFACTURER'S STANDARD CONSTRUCTION), FACTORY ACCESSORIES SHALL BE PROVIDED TO ENSURE UNIT MEETS SCHEDULED PERFORMANCE 7. UNIT SHALL BE PROVIDED WITH MULTI-SPEED PSC (MIN. 5) OR ECM MOTOR. 8. INSULATED CABINET - NO INSULATION SHALL BE EXPOSED TO AIRSTREAM. 9. CORROSION RESISTANT DRAIN PAN WITH WATER-SENSING OVER-FLOW ALARM - SENSOR SHALL BE HIGHER THAN THE PRIMARY DRAIN LINE AND BELOW THE OVERFLOW RIM; UNIT TO SHUT-DOWN WITH MANUAL RESTART UPON ALARM SIGNAL. 10. COOLING COILS SHALL BE COPPER TUBE WITH ALUMINUM FINS. PROVIDE FACTORY FURNISHED PIPING AND VALVE KIT - ALL VALVES AND ACCESSORIES FOR REFRIGERANT PIPING CONNECTIONS SHALL BE INCLUDED. 11. PROVIDE WITH VIBRATION ISOLATION BASE/HANGERS. 12. UNIT SHALL BE PROVIDED WITH FACTORY CONDENSATE PUMP - IF FACTORY PUMP IS NOT AVAILABLE, CONTRACTOR SHALL PROVIDE AND INSTALL INLINE PUMP (LITTLE GIANT EC, OR APPROVED EQUAL). ROUTE CONDENSATE TO NEAREST HUB DRAIN - COORDINATE WITH PLUMBING AND ELECTRICAL CONTRACTORS.													

AIR-COOLED CONDENSING UNIT (DX AND HEAT PUMP)

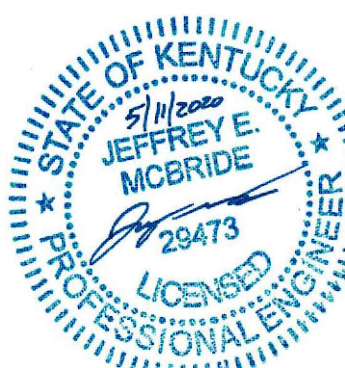
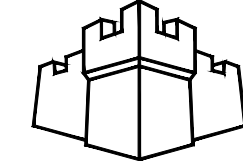
MARK	TYPE	TOTAL CAPACITY, BTUH	BASIS OF DESIGN MANUFACTURER	MODEL NO.	SEER	MCA	MOCP	ELECTRICAL	REMARKS
CU-101	HEAT PUMP	15,000	DAIKIN	NTXSK5	19.8	10	18	208-230/1 PH	ALL
CU-102	HEAT PUMP	15,000	DAIKIN	NTXSK5	19.8	10	18	208-230/1 PH	ALL
REMARKS: 1. ALL UNIT COMPONENTS, INCLUDING MOTORS SHALL MEET LATEST APPLICABLE ENERGY EFFICIENCY REQUIREMENTS. ALL EQUIPMENT SHALL BE UL-LISTED. 2. THERMAL OVERLOAD PROTECTION; UNIT-MOUNTED SERVICE/DISCONNECT SWITCH; LOW-VOLTAGE TRANSFORMERS AS REQUIRED. 3. UNLESS OTHER APPROVED, UNITS SHALL HAVE ALL SERVICE ACCESS ON ONE SIDE. CONTRACTOR SHALL COORDINATE LOCATION OF UNITS WITH RESPECT TO OTHER UTILITIES AND BUILDING ELEMENTS TO ENSURE ADEQUATE SERVICE CLEARANCES ARE PROVIDED. 4. LOW-AMBIENT OPERATION. IN EXTREME ENVIRONMENTS (E.G. THOSE WITH ALTITUDES AND/OR DESIGN TEMPERATURES OUTSIDE OF MANUFACTURER'S STANDARD CONSTRUCTION), FACTORY ACCESSORIES SHALL BE PROVIDED TO ENSURE UNIT MEETS SCHEDULED PERFORMANCE - INCLUDING WIND BAFFLES AND BASIN HEATER. BASIN HEATER MAY BE OMITTED WITH APPROVAL OF OWNER/ENGINEER. 5. UNITS SHALL BE FACTORY-EQUIPPED TO BE READILY INTEGRATED WITH A BUILDING AUTOMATION SYSTEM AND SHALL COMMUNICATE USING INDUSTRY-STANDARD CONTROLS LANGUAGE. 6. UNIT SHALL BE PROVIDED WITH THE FOLLOWING FACTORY FEATURES: ANTI SHORT-CYCLE PROTECTION / TIME DELAY CONTROLS; START KIT; CRANK-CASE HEATER; HIGH AND LOW PRESSURE SWITCH; BI-DIRECTIONAL FILTER DRYER; RUBBER ISOLATORS FOR CONDENSER; HARD START KIT. 7. UNITS 3-TONS AND LARGER SHALL BE PROVIDED WITH EVAPORATOR DEFROST CONTROL. 8. PROVIDE UNIT WITH FACTORY SOUND PACKAGE INCLUDING COMPRESSOR BLANKET AND FAN/BLOWER ISOLATORS. 9. PROVIDE UNIT WITH COIL HAIL GUARD. 10. UNIT SHALL BE PROVIDED WITH 2-STAGE OR MODULATING COMPRESSORS.									

PACKAGED TERMINAL AIR CONDITIONER (PTAC) WITH ELECTRIC HEAT SCHEDULE

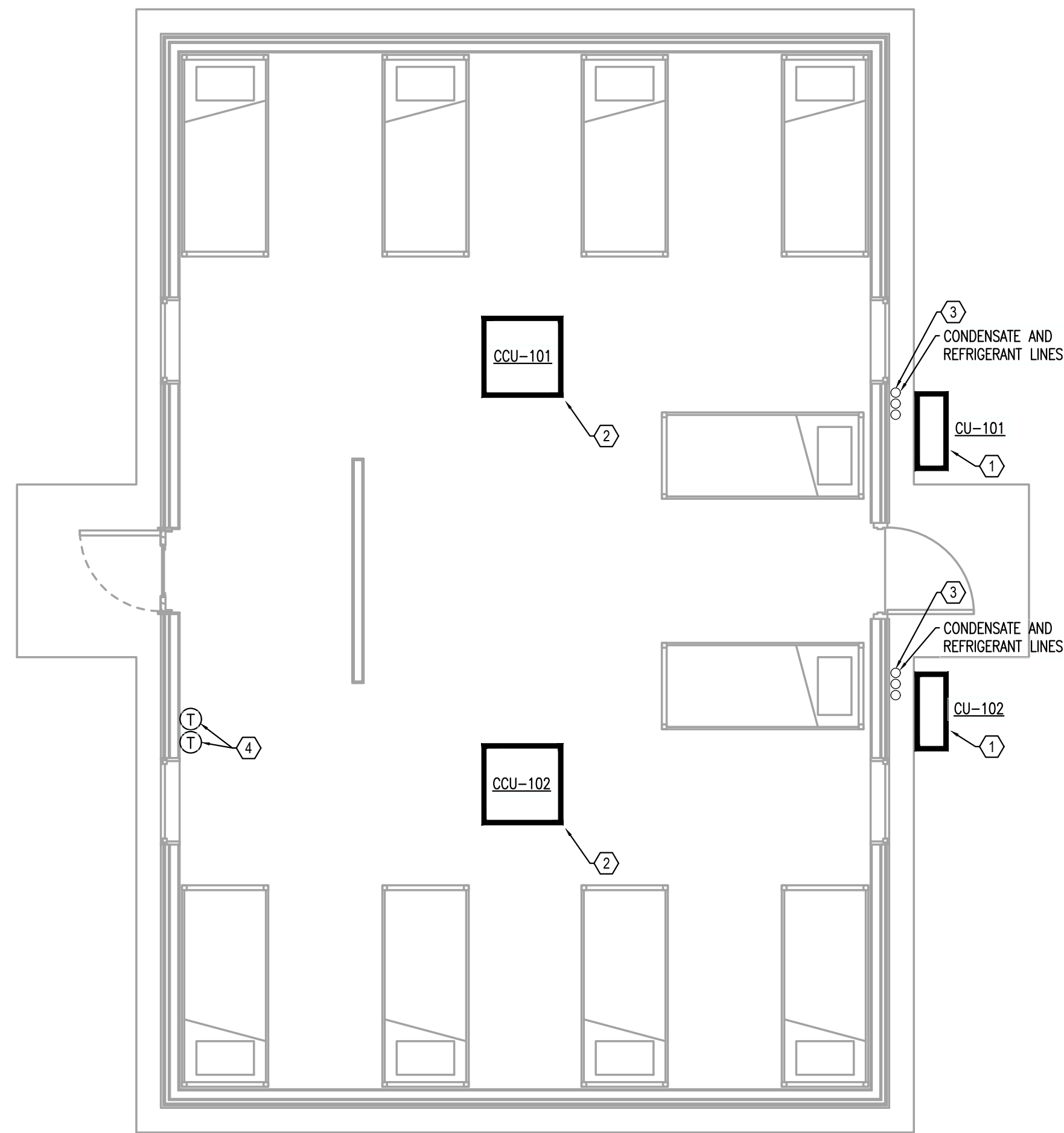
MARK	AIRFLOW, CFM	OUTSIDE AIR, CFM	TOTAL COOLING, BTUH	HEAT PUMP HEATING, BTUH	ELEC. HEATING CAPACITY, BTUH	EER	BASIS OF DESIGN MANUFACTURER	MODEL NO.	MCA	MOCP	ELECTRICAL	REMARKS
PTAC-101	390	35	14,700	13,600	14,000 / 5.0kW	9.7	AMANA	PTH15	27.6	30	208 / 1 PH	ALL
REMARKS: 1. BASIS OF DESIGN: AMANA THRU-WALL CHASSIS UNITS WITH ELECTRIC HEATING AND COOLING. PROVIDE ALL PTAC UNITS WITH: FACTORY CONDENSATE DRAIN KIT; NOISE REDUCTION TRIM FOR FANS AND COMPRESSORS; FRONT COVER; FACTORY-INSTALLED POWER CORD; PROVIDE UNITS WITH INSULATED METAL WALL SLEEVE AND EXTERIOR ARCHITECTURAL GRILLE – COLOR SELECTION BY ARCHITECT. INSTALL CHASSIS UNITS IN WALL SLEEVE AND AFFIX EXTERIOR GRILLES SPECIFIED. 2. UNITS SHALL BE PROVIDED WITH SLIDE-OUT PERMANENT, WASHABLE INTAKE AIR FILTERS. 3. COOLING/HEATING PERFORMANCE AND EER IS BASED UPON AHRI CONDITIONS AT 208 VOLTS – UNITS SHALL BE CAPABLE OF OPERATING AT BETWEEN 197 AND 253 VOLTS. 4. ALL UNIT COMPONENTS, INCLUDING MOTORS SHALL MEET LATEST APPLICABLE ENERGY EFFICIENCY REQUIREMENTS. ALL EQUIPMENT SHALL BE UL-LISTED. 5. THERMAL OVERLOAD PROTECTION; UNIT-MOUNTED SERVICE/DISCONNECT SWITCH; ANTI SHORT-CYCLE PROTECTION; LOW-VOLTAGE TRANSFORMERS AS REQUIRED. 6. UNLESS OTHER APPROVED, UNITS SHALL HAVE ALL SERVICE ACCESS ON ONE SIDE. CONTRACTOR SHALL COORDINATE LOCATION OF UNITS WITH RESPECT TO OTHER UTILITIES AND BUILDING ELEMENTS TO ENSURE ADEQUATE SERVICE CLEARANCES ARE PROVIDED. 7. LOW-AMBIENT OPERATION. IN EXTREME ENVIRONMENTS (E.G. THOSE WITH ALTITUDES AND/OR DESIGN TEMPERATURES OUTSIDE OF MANUFACTURER'S STANDARD CONSTRUCTION), FACTORY ACCESSORIES SHALL BE PROVIDED TO ENSURE UNIT MEETS SCHEDULED PERFORMANCE 8. ELECTRIC HEATING COILS SHALL BE U.L. LISTED FOR ZERO-CLEARANCE – OPEN COIL TYPE. HEATING ELEMENT SHALL BE HIGH GRADE NICKEL-CHROME. 9. COOLING COILS SHALL BE COPPER TUBE WITH ALUMINUM FINS. 10. EACH UNIT SHALL BE PROVIDED WITH A WALL-MOUNTED THERMOSTAT. FIELD PROGRAM UNITS WITH PTAC TOUCHPAD. SEE PLANS FOR MORE INFORMATION – COORDINATE FINAL LOCATION WITH OWNER/ARCHITECT. UNITS IN MECHANICAL/ELECTRICAL SPACES SHALL HAVE UNIT-MOUNTED CONTROLS.												

HVAC BASIS OF DESIGN

- A. THE HVAC DESIGN AND SUBSEQUENT CONSTRUCTION, INCLUDING BUT NOT LIMITED TO: OUTSIDE AIR REQUIREMENTS, EQUIPMENT EFFICIENCIES, DUCT INSULATION/SEALING, PIPE INSULATION, ETC. IS BASED UPON COMPLIANCE WITH THE LATEST EDITIONS OF MECHANICAL CODE, NFPA, ASHRAE 90.1, ASHRAE 62.1, AND THE IECC.
- B. HEATING, COOLING AND VENTILATION CALCULATIONS ARE BASED UPON THE FOLLOWING:
- B.1. CLIMATE ZONE 4; COOLING DESIGN TEMPERATURE = 94/17 DEG. F.; HEATING DESIGN TEMPERATURE = 5 DEG. F.
- B.2. OFFICE SPACES VENTILATED AT A RATE OF 0.06 CFM/SF AND 5 CFM/PERSON; CABINS TO HAVE NATURAL VENTILATION.
- B.3. DENSELY OCCUPIED SPACES (DINING AREAS, CONFERENCE ROOMS, LARGE OPEN OFFICES, ETC.) SHALL BE PROVIDED WITH DEMAND CONTROL VENTILATION - EITHER CO2 SENSOR(S) OR OCCUPANCY SENSOR(S).
- B.4. BUILDING ENVELOPE INFORMATION AS FOLLOWS: EXISTING BUILDING - SEE ARCHITECTURAL DRAWINGS FOR MORE INFORMATION. ALL NEW WALL, ROOF OR WINDOW ASSEMBLIES, ETC. SHALL MEET CODE-MINIMUM PERFORMANCE.
- C. CONTRACTOR SHALL PROVIDE AND INSTALL A FULLY WORKING HVAC SYSTEM INCLUDING: CONTROLS, PACKAGED HVAC EQUIPMENT, EXHAUST FANS, ROOF CURB(S), DUCTWORK, HANGERS, SUPPORTS, CONCRETE PADS, INSULATION, AND ALL REQUIRED ACCESSORIES/APPURTENANCES. HVAC EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO:
- C.1. CABINS: EACH CABIN SHALL BE PROVIDED WITH TWO (2) DUCTLESS SPLIT SYSTEM INDOOR UNITS (CEILING CASSETTE TYPE) EACH WITH A HEAT PUMP CONDENSING UNIT.
- C.2. SHOP: THE OFFICE AREA SHALL BE PROVIDED WITH A THRU-WALL, PACKAGED TERMINAL AIR CONDITIONER WITH BACK-UP ELECTRIC HEAT.

<div>Rampart Engineering 2020 "Engineering Work" defined by tangible medium of expression in the property of Rampart Engineering, PLLC and subject to all legally-afforded protections, including copyright law. "Property" extends to the overall concept, engineering, design and layout of systems, control sequences and any other associated work. The contract documents, including drawings and specifications are Professional Instruments of Service and are the property of Rampart Engineering, PLLC.</div>	DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
	A&E FILE NO.	2019-24	MECHANICAL GENERAL NOTES, SCHEDULES, ETC.	
	DRAWING DATE:	05/11/2020	DRAWING NO.	
	DRAWN BY: TP CHECKED BY: JM PHASE: RTA RTA DATE: 5/11/2020	ACCOUNT NO. 540-C97Q-FF19-00	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
	STAMP: 	10109 Headley Hill RD Louisville, KY 40223 502-541-5352	 E: JJEFFREY@RAMPARTENGINEERING.COM	
REVISION HISTORY OF THIS DRAWING		DECA REVIEWED		
DESCRIPTION OF REVISIONS		DATE	DESCRIPTION OF REVISIONS	DATE
1			5	
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4			8	






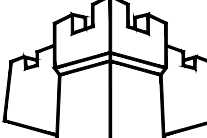
1 MECHANICAL PLAN - CABINS 1 AND 2  
M101 SCALE: 1/4" = 1'-0"

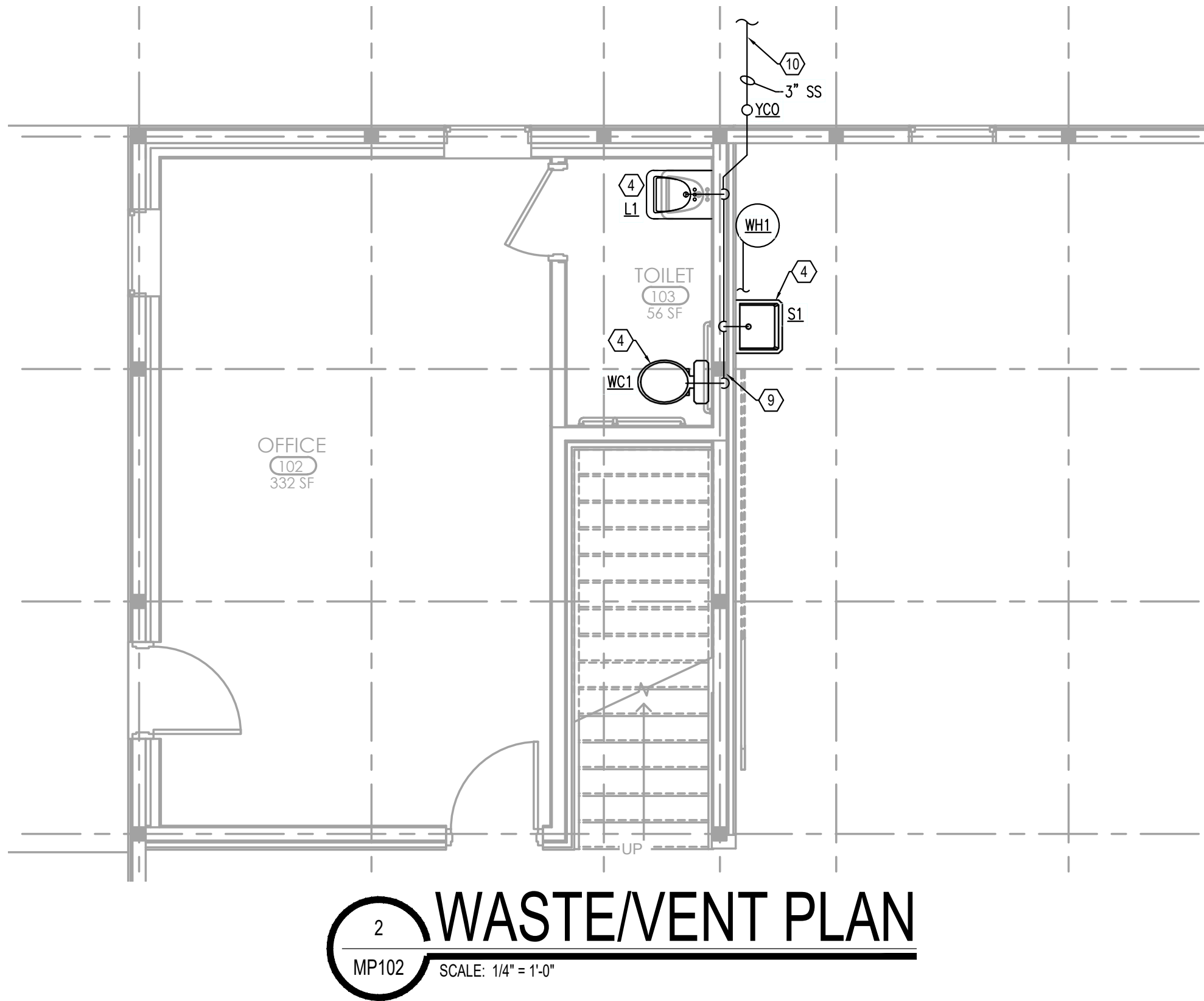
HVAC GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL UV-PROTECTIVE COATING AND/OR CLADDING TO ELASTOMERIC PIPE INSULATION THAT IS EXPOSED TO SUNLIGHT (E.G. REFRIGERANT PIPING).
2. COORDINATE ALL SLAB/FLOOR, WALL AND TRUSS PENETRATIONS WITH ARCHITECT, STRUCTURAL ENGINEER AND/OR JOIST/TRUSS MANUFACTURER. RE-ROUTE PIPING AS REQUIRED TO ACCOMMODATE FOOTINGS, TRUSS WEBBING, STRUCTURAL STEEL/CONCRETE, ETC. PROVIDE STRUCTURAL REINFORCEMENT AS REQUIRED FOR PENETRATIONS.
3. ALL VALVES, MIXING VALVES, MANIFOLDS, ACCESSORIES, OR ANY ITEMS REQUIRING MAINTENANCE OR INSPECTION SHALL BE FULLY ACCESSIBLE. IN AREAS WITH HARD CEILINGS, PROVIDE ACCESS PANELS - CONFIRM FINISH, SIZE, AND MOUNTING STYLE WITH ARCHITECT. WHERE POSSIBLE, AND WHERE ALL REQUIRED CLEARANCES CAN BE MAINTAINED, A SINGLE ACCESS PANEL SHALL BE UTILIZED FOR MULTIPLE, ADJACENT ITEMS.
4. DUCT INSTALLED IN CONTINUOUS FIRE-RATED ASSEMBLY: DUCT THAT CROSSES THE FIRE-RATED ASSEMBLIES SHALL BE PROVIDED WITH DAMPERS AS REQUIRED TO MAINTAIN FIRE/SMOKE RATINGS. DUCT INSTALLATION/MATERIALS SHALL MEET ALL RELEVANT CODES, AS PRESCRIBED BY AHJ. DUCT, FITTINGS, GRILLES, ETC. SHALL BE INSTALLED PER IMC TO ENSURE COMPLIANCE WITH FIRE DAMPER EXEMPTIONS, INCLUDING, BUT NOT LIMITED TO: SHEET METAL THICKNESS, REQUIRED SLEEVES, CONTINUOUS METAL DUCT, CEILING RADIATION DAMPERS, ETC.
5. THOUGH NOT TYPICALLY SHOWN ON FLOOR PLANS, ALL AIR DEVICES THAT AND FANS THAT PENETRATE RATED CEILING ASSEMBLIES IN SHALL BE PROVIDED WITH RADIATION DAMPERS.
6. THOUGH NOT ALWAYS SHOWN ON FLOOR PLANS, ALL DUCT THAT PENETRATES FIRE/SMOKE RATED ASSEMBLIES SHALL BE PROVIDED WITH CODE-REQUIRED PROTECTION, INCLUDING FIRE, SMOKE AND COMBINATION FIRE/SMOKE DAMPERS. COORDINATE PROVISION OF POWER WITH ELECTRICAL CONTRACTOR, AND COORDINATE ANY REQUIRED ACCESS PANELS WITH OWNER, ARCHITECT AND G.C.
7. UNDER-CUT DOORS AS REQUIRED FOR NEGATIVE PRESSURIZATION/AIRFLOW. COORDINATE WITH G.C. AND ARCHITECT.
8. COORDINATE DUCT ROUTING AND GRILLE PLACEMENT WITH STRUCTURE AND ALL OTHER UTILITIES AND CEILING-MOUNTED ITEMS. PROVIDE DETAILED SHOP/COORDINATION DRAWINGS FOR ARCHITECT/ENGINEER REVIEW PRIOR TO INSTALLATION.
9. ANY DUCT, PIPING OR INSULATION THAT IS EXPOSED INDOORS SHALL BE PAINTED (MINIMUM TWO (2) FINAL COATS - FINAL COLOR SELECTION BY ARCHITECT).

HVAC KEY NOTES

1. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO INSTALL NEW CONDENSING UNIT. MOUNT UNIT ON STEEL RAILS, PAINTED WITH TWO COATS OF RUST INHIBITING PAINT. ROUTE REFRIGERANT PIPE IN TO CABIN ATTIC SPACE AND OVER TO INDOOR UNITS. INSULATE PIPING AND SECURE TO BUILDING EXTERIOR WITH SPLIT METAL CLAMPS. COORDINATE WITH ALL OTHER TRADES AND SEAL PENETRATIONS WEATHER-TIGHT.
2. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO INSTALL SURFACE-MOUNTED DUCTLESS SPLIT SYSTEM UNIT. UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED CONDENSATE PUMP (IF UNAVAILABLE, CONTRACTOR SHALL PROVIDE AND INSTALL INLINE PUMP) - ROUTE CONDENSATE OUT SOFFIT AND DOWN THE EXTERIOR WALL. INSULATE INTERIOR AND EXTERIOR DRAIN PIPING AND SPILL TO CONCRETE SPLASH-BLOCK - COORDINATE EXTERIOR PENETRATION AND DRAIN LOCATION WITH ARCHITECT/OWNER. COORDINATE WITH ALL OTHER TRADES AND SEAL PENETRATIONS WEATHER-TIGHT.
3. RACK CONDENSATE AND REFRIGERANT LINES ON BUILDING EXTERIOR. PRIME AND PAINT INSULATION WITH EXTERIOR-RATED FINISHES- MINIMUM TWO COATS, ARCHITECT TO SELECT COLOR.
4. PROVIDE THERMOSTAT WITH LOCKING PLASTIC COVER AND TURN OVER KEYS TO OWNER. COORDINATE FINAL LOCATION AND MOUNTING HEIGHT WITH OWNER/ARCHITECT (TYP. 42-48" A.F.F.)

DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION			
A&E FILE NO.	2019-24	NEW CABINS - MECHANICAL PLANS			DRAWING NO.  <b>M101</b>
DRAWING DATE:	05/11/2020				
DRAWN BY:	TP				
CHECKED BY:	JM				
PHASE	RTA				
RTA DATE:	5/11/2020	ACCOUNT NO.	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY		
STAMP:		540-C97Q-FF19-00			
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		10109 Headley Hill RD Louisville, KY 40223 502-541-5352		FOR INTENT ONLY DECA LOG # <b>A1C-6925</b>	
		DESCRIPTION OF REVISIONS	DATE	DESCRIPTION OF REVISIONS	DATE
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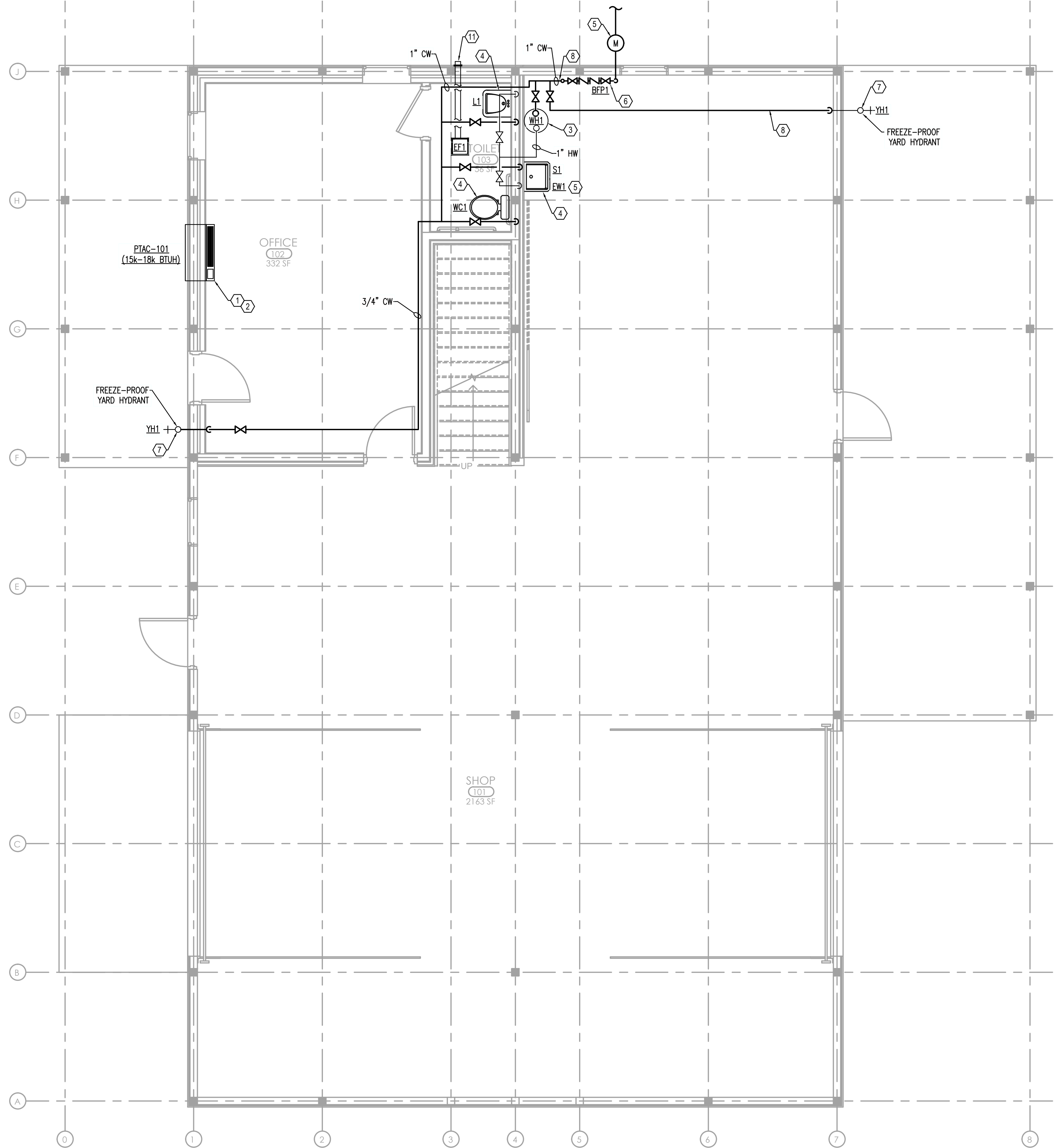


## HVAC AND PLUMBING GENERAL NOTES

- CONTRACTOR SHALL PROVIDE AND INSTALL UV-PROTECTIVE COATING AND/OR CLADDING TO ELASTOMERIC PIPE INSULATION THAT IS EXPOSED TO SUNLIGHT (E.G. REFRIGERANT PIPING).
- COORDINATE ALL SLAB/FLOOR, WALL AND TRUSS PENETRATIONS WITH ARCHITECT, STRUCTURAL ENGINEER AND/OR JOIST/TRUSS MANUFACTURER. RE-ROUTE PIPING AS REQUIRED TO ACCOMMODATE FOOTINGS, TRUSS WEBBINGS, STRUCTURAL STEEL/CONCRETE, ETC. PROVIDE STRUCTURAL REINFORCEMENT AS REQUIRED FOR PENETRATIONS.
- ALL VALVES, MIXING VALVES, MANIFOLDS, ACCESSORIES, OR ANY ITEMS REQUIRING MAINTENANCE OR INSPECTION SHALL BE FULLY ACCESSIBLE. IN AREAS WITH HARD CEILINGS, PROVIDE ACCESS PANELS - CONFIRM FINISH, SIZE, AND MOUNTING STYLE WITH ARCHITECT. WHERE POSSIBLE, AND WHERE ALL REQUIRED CLEARANCES CAN BE MAINTAINED, A SINGLE ACCESS PANEL SHALL BE UTILIZED FOR MULTIPLE, ADJACENT ITEMS.
- PROVIDE CODE-REQUIRED INSULATION/JACKETING FOR EXPOSED WASTE AND SUPPLY PIPING TO COMPLY WITH ADA REQUIREMENTS.
- PROVIDE INDIRECT DRAINS FOR FIXTURES, AS REQUIRED BY KENTUCKY PLUMBING CODE. COORDINATE DRAIN TYPE (FLOOR DRAIN, SINK, FUNNEL, ETC.) AND LOCATION WITH ARCHITECT/OWNER. ENSURE THAT FIXTURE TYPE ALLOWS FOR MINIMUM AIR GAPS, PER FIXTURE TYPE.
- NEW DOMESTIC WATER PIPING SYSTEMS SHALL BE PEX.
- DUCT INSTALLED IN CONTINUOUS FIRE-RATED ASSEMBLY:  
DUCT THAT CROSSES THE FIRE-RATED ASSEMBLIES SHALL BE PROVIDED WITH DAMPERS AS REQUIRED TO MAINTAIN FIRE/SMOKE RATINGS. DUCT INSTALLATION/MATERIALS SHALL MEET ALL RELEVANT CODES, AS PRESCRIBED BY AHJ. DUCT, FITTINGS, GRILLES, ETC. SHALL BE INSTALLED PER IMC TO ENSURE COMPLIANCE WITH FIRE DAMPER EXEMPTIONS, INCLUDING, BUT NOT LIMITED TO: SHEET METAL THICKNESS, REQUIRED SLEEVES, CONTINUOUS METAL DUCT, CEILING RADIATION DAMPERS, ETC.
- THOUGH NOT TYPICALLY SHOWN ON FLOOR PLANS, ALL AIR DEVICES THAT AND FANS THAT PENETRATE RATED CEILING ASSEMBLIES IN SHALL BE PROVIDED WITH RADIATION DAMPERS.
- THOUGH NOT ALWAYS SHOWN ON FLOOR PLANS, ALL DUCT THAT PENETRATES FIRE/SMOKE RATED ASSEMBLIES SHALL BE PROVIDED WITH CODE-REQUIRED PROTECTION, INCLUDING FIRE, SMOKE AND COMBINATION FIRE/SMOKE DAMPERS. COORDINATE PROVISION OF POWER WITH ELECTRICAL CONTRACTOR, AND COORDINATE ANY REQUIRED ACCESS PANELS WITH OWNER, ARCHITECT AND G.C.
- UNDER-CUT DOORS AS REQUIRED FOR NEGATIVE PRESSURIZATION/AIRFLOW. COORDINATE WITH G.C. AND ARCHITECT.
- COORDINATE DUCT ROUTING AND GRILLE PLACEMENT WITH STRUCTURE AND ALL OTHER UTILITIES AND CEILING-MOUNTED ITEMS. PROVIDE DETAILED SHOP/COORDINATION DRAWINGS FOR ARCHITECT/ENGINEER REVIEW PRIOR TO INSTALLATION.
- ANY DUCT, PIPING OR INSULATION THAT IS EXPOSED INDOORS SHALL BE PAINTED (MINIMUM TWO (2) FINAL COATS - FINAL COLOR SELECTION BY ARCHITECT).

## HVAC AND PLUMBING KEY NOTES

- CONTRACTOR SHALL PROVIDE AN INSTALL PTAC UNIT - COORDINATE WITH ALL OTHER TRADES AND SEAL PENETRATIONS WEATHER-TIGHT. PROVIDE WALL SLEEVE AS REQUIRED/DIRECTED BY ARCHITECT - COLOR FOR GRILLES, BODY, ETC. TO BE SELECTED BY ARCHITECT. (TYPICAL FOR ALL PTAC UNITS)
- ROUTE PTAC CONDENSATE THRU EXTERIOR WALL (MAIN PIPING BY PLUMBING CONTRACTOR), AND SPILL TO CONCRETE SPLASH BLOCK. COORDINATE DRAIN PIPING WITH ALL OTHER UTILITIES AND EXTERIOR-MOUNTED ITEMS.
- PROVIDE ALL LABOR AND MATERIAL REQUIRED TO INSTALL NEW ELECTRIC WATER HEATER ON ELEVATED SUPPORT RACK. DRAIN TO SERVICE SINK COORDINATE PROVISION OF POWER WITH ELECTRICAL CONTRACTOR. ENSURE ALL SERVICE AND CODE-REQUIRED UNIT CLEARANCES ARE MAINTAINED.
- PROVIDE FIXTURE WITH NEW WASTE, VENT, TRAPS AND DOMESTIC HW/CW PIPING. DOMESTIC WATER PIPING SHALL BE PROVIDED WITH SHUT-OFF VALVES LOCATED ABOVE CEILING IN AN ACCESSIBLE LOCATION (PROVIDE ACCESS PANELS AS REQUIRED), OR BELOW COUNTER. WHERE REQUIRED (E.G. LAVATORIES), INSTALL THERMOSTATIC MIXING VALVE WITH A MAXIMUM OUTLET TEMPERATURE OF 110 DEG. F. INSTALL INSULATED TRAP WRAP ON ALL EXPOSED SANITARY WASTE PIPING BELOW SINKS, AS REQUIRED PER ADA GUIDELINES (TYPICAL FOR ALL PLUMBING FIXTURES)
- PROVIDE AND INSTALL NEW EMERGENCY EYEWASH ON S1 FAUCET. PROVIDE THREADED ADAPTERS AS REQUIRED.
- DOMESTIC WATER BACKFLOW PREVENTER. COORDINATE WITH INSTALLATION OF FIRE PROTECTION BACKFLOW PREVENTION DEVICE (ABOVE), SERVICE DRAINS, ETC. ENSURE THAT ADEQUATE SPACE IS LEFT FOR INSTALLATION OF FIRE SERVICE LINES/EQUIPMENT.
- FREEZE-PROOF YARD HYDRANT. ROUTE PIPING DOWN INTERIOR WALL AND BELOW GRADE THRU TO EXTERIOR - PROVIDE FLOOR SLEEVE AND SEAL ALL PENETRATIONS WEATHER TIGHT. COORDINATE PIPE ROUTING WITH FOUNDATION, PIERS, FOOTINGS, ETC. IF PIPE IS ROUTED INSIDE OF WALL, INSULATE WITH MINIMUM 3/4" FLEXIBLE ELASTOMERIC INSULATION AND BRACE SO AS TO NOT ALLOW CONTACT WITH EXTERIOR WALL SURFACES.
- DOMESTIC WATER PIPING IN SHOP AREA SHALL BE PROVIDED WITH DRAIN DOWN AND ISOLATION VALVES.
- COORDINATE SANITARY WASTE PIPE ROUTING WITH FOUNDATION, PIERS, FOOTINGS, ETC.
- EXTEND NEW 3" SANITARY MAIN TO EXISTING SERVICE. COORDINATE YARD CLEAN OUT LOCATION WITH GRADE, FOOTINGS, ETC. SEE SITE PLAN FOR MORE INFORMATION.
- ROUTE 4" RESTROOM EXHAUST TO EXTERIOR WALL AND PROVIDE WITH EXHAUST HOOD (W/ INSECT/BIRD SCREEN). SEAL ALL PENETRATIONS WEATHER-TIGHT.



## HVAC AND DW PLAN

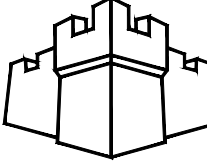
DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
A&E FILE NO.	2019-24	NEW SHOP - HVAC AND PLUMBING PLAN	
DRAWING DATE:	05/11/2020	ACCOUNT NO.	DRAWING NO.
DRAWN BY:	TP	540-C97Q-FF19-00	MP102
CHECKED BY:	JM	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	
PHASE	RTA	DECA REVIEWED	
RTA DATE:	5/11/2020	FOR INTENT ONLY DECA LOG #	
STAMP:		A1C-6926	
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STATE OF KENTUCKY JEFFREY E. MCBRIDE 28473 LICENSED PROFESSIONAL ENGINEER		RAMPART ENGINEERING E: JJEFFREY@RAMPARTENGINEERING.COM	
REVISION HISTORY OF THIS DRAWING		REVISION HISTORY OF THIS DRAWING	
DESCRIPTION OF REVISIONS		DESCRIPTION OF REVISIONS	
1	5	1	5
2	6	2	6
3	7	3	7
4	8	4	8



ELECTRICAL SYMBOLS LEGEND	
LIGHTING	POWER
<div></div> <div>2' X 4' LIGHT FIXTURE F1 - INDICATES FIXTURE TYPE (REFER TO SCHEDULE FOR INFO) b- DENOTES SWITCH DESIGNATION NL- DENOTES NITE LIGHT CIRCUIT</div> <div></div> <div>2' X 4' SURFACE MOUNTED LED LIGHT FIXTURE</div> <div></div> <div>2' X 4' RECESSED LED LIGHT FIXTURE WITH EMERGENCY POWER</div> <div></div> <div>1' X 4' SURFACE MOUNTED LED LIGHT FIXTURE</div> <div></div> <div>2' X 4' RECESSED LED LIGHT FIXTURE WITH EMERGENCY POWER</div> <div></div> <div>STRIP LIGHT FIXTURE</div> <div></div> <div>LED DOWNLIGHT FIXTURE</div> <div></div> <div>COMBINATION EMERGENCY EXIT SIGN AND BATTERY LIGHT, SINGLE FACE WITH DUAL HEADS AND INTEGRAL BATTERY POWER SUPPLY</div> <div></div> <div>WALL MOUNTED TWO HEAD EMERGENCY LIGHT.</div> <div></div> <div>SINGLE POLE WALL SWITCH</div> <div></div> <div>THREE-WAY WALL SWITCH</div> <div></div> <div>DIMMER WALL SWITCH</div> <div></div> <div>WALL MOUNTED OCCUPANCY SENSOR</div> <div></div> <div>CEILING MOUNTED LOW VOLTAGE DUAL TECHNOLOGY OCCUPANCY/VACANCY SENSOR.</div>	<div></div> <div>DUPLEX RECEPTACLE</div> <div></div> <div>QUADRAPLEX RECEPTACLE</div> <div></div> <div>SPECIAL PURPOSE RECEPTACLE</div> <div></div> <div>FIRE RATED MULTI-SERVICE FLOOR BOX, COORDINATE EXACT LOCATION WITH ARCHITECTURAL FURNITURE PLAN PRIOR TO INSTALLATION.</div> <div></div> <div>JUNCTION BOX WALL AND/OR CEILING, FLUSH MOUNT, 4" X 4" SQUARE UNLESS OTHERWISE NOTED. REFER TO ELECTRICAL DRAWING FOR MORE DETAILS.</div> <div></div> <div>FUSIBLE DISCONNECT SWITCH</div> <div></div> <div>SURFACE MOUNTED PANEL BOARD</div> <div></div> <div>CONDUIT DOWN.</div> <div></div> <div>CONDUIT UP.</div> <div></div> <div>CONDUIT CAPPED</div> <div></div> <div>BRANCH CIRCUIT WIRING</div> <div></div> <div>PHASE (HOT)</div> <div></div> <div>NEUTRAL (GROUND)</div> <div></div> <div>EQUIPMENT GROUNDING</div>
SYSTEMS / FIRE ALARM	TYPICAL MOUNTING HEIGHTS
<div></div> <div>TELEPHONE/DATA OUTLET - SINGLE GANG OUTLET BOX WITH 3/4" CONDUIT WITH PULLWIRE STUBBED UP ABOVE ACCESSIBLE CEILING SPACE</div> <div></div> <div>MAIN FIRE ALARM CONTROL PANEL.</div> <div></div> <div>FIRE ALARM REMOTE ANNUNCIATOR.</div> <div></div> <div>CEILING MOUNTED SMOKE ALARM WITH STROBE LIGHT</div> <div></div> <div>CEILING MOUNTED HEAT DETECTOR</div> <div></div> <div>MANUAL FIRE ALARM DUAL-ACTION PULL STATION</div> <div></div> <div>WALL MOUNTED FIRE ALARM VISUAL/AUDIO NOTIFICATION DEVICE</div> <div></div> <div>WALL MOUNTED FIRE ALARM VISUAL NOTIFICATION DEVICE</div> <div></div> <div>INDIVIDUAL ADDRESSABLE MODULE</div>	<div>ALL DIMENSIONS FOR DEVICE MOUNTING HEIGHTS ARE MEASURED FROM FINISHED FLOOR TO CENTER OF DEVICE OUTLET BOX, UNLESS OTHERWISE INDICATED. MOUNTING HEIGHTS SHALL BE AS FOLLOWS:</div> <div><ul style="list-style-type: none"><li>WALL SWITCH, DIMMER SWITCH, OVERRIDE SWITCH, LIGHT PRESET CONTROL STATION - 46" AFF</li><li>RECEPTACLE, DATA, DESK TOP TELEPHONE, TV OUTLET - 18" AFF</li><li>ABOVE COUNTER RECEPTACLE/DEVICE - 3" ABOVE BACK SPLASH OF COUNTER OR 8"</li><li>ABOVE FINISHED COUNTER TOP, WHICHEVER IS LOWER, (COORDINATE WITH ARCHITECT)</li><li>REFRIGERATOR RECEPTACLE - 54" AFF</li><li>TELEPHONE - 18" AFF OR WALL - 54" AFF</li><li>FIRE ALARM DEVICES<ul style="list-style-type: none"><li>FIRE ALARM PULL STATION - 46" AFF</li><li>WALL MOUNTED FIRE ALARM HORN &amp; STROBE LIGHT, FIRE ALARM STROBE LIGHT - 80" AFF OR 6" BELOW CEILING WHICHEVER IS LOWER.</li></ul></li></ul></div>

GENERAL ELECTRICAL NOTES:	
A. ALL MATERIALS FURNISHED AND ALL INSTALLED SHALL BE IN ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE, NFPA, ASHRAE, ALL LOCAL AND STATE CODES, REQUIREMENTS OF LOCAL UTILITY COMPANIES, AND THE REQUIREMENTS OF ALL GOVERNMENTAL AGENCIES OR DEPARTMENTS HAVING JURISDICTION. IF ANY CONFLICTS OR DISCREPANCIES OCCUR, THE MOST STRINGENT SHALL APPLY.	BE INSTALLED IN ACCORD WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY. FINAL ELECTRICAL CONNECTIONS TO FOOD SERVICE EQUIPMENT BY ELECTRICAL CONTRACTOR (TYPICAL).
B. ELECTRICAL CONTRACTOR SHALL VISIT AND EXAMINE THE SITE PRIOR TO SUBMITTING BID TO BECOME FAMILIAR WITH EXISTING CONDITIONS. NO ALLOWANCE SHALL BE MADE FOR EXISTING CONDITIONS NOT KNOWN TO THE CONTRACTOR.	X. ALL SUPPORTS FOR EQUIPMENT, DEVICES OR FIXTURES SHALL BE UNIQUE, FROM THE BUILDING STRUCTURE. DO NOT SUPPORT WORK FROM OTHER TRADES. EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER AND CONSENT OF THE OTHER TRADE, IN WRITING. SUPPORTING FROM CROSS BRACING OR ROOF DECK WILL NOT BE ALLOWED.
C. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES, PERMITS AND LICENSES FOR THE COMPLETE INSTALLATION OF HIS WORK. DRAWINGS ARE DIAGRAMMATIC REPRESENTATION OF THE WORK AND INDICATES GENERAL ARRANGEMENT. SEE ARCHITECTURAL DRAWINGS FOR EXACT DIMENSIONS.	Y. WHERE INTERRUPTING AN EXISTING UTILITY OR SERVICE DELIBERATELY OR ACCIDENTALLY, THE RESPONSIBLE CONTRACTOR SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME, PROVIDING PREMIUM TIME AS NEEDED.
D. ALL CUTTING AND PATCHING OF WALLS AND FLOOR FOR ELECTRICAL EQUIPMENT/WORK SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.	Z. REFER TO ARCHITECTURAL WALL ELEVATIONS (WHERE GIVEN) FOR HEIGHTS AND MOUNTING RELATIONSHIP OF OUTLETS AND EQUIPMENT. IF IN DOUBT, CONTACT THE ENGINEER FOR DIRECTION PRIOR TO INSTALLING WORK.
E. PROVIDE FIRE STOP PER BUILDING CODE TO ALL CONDUITS PENETRATING THROUGH FIRE RATED WALLS/PARTITION, FLOORS AND CEILINGS. COORDINATION WITH THE GENERAL CONTRACTOR SHALL BE MAINTAINED TO INSURE THAT FIRE STOPPING IS ACCOMPLISHED. USE APPROVED U.L. OR EQUIVALENT SEALANT. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING/PATCHING ANY CONDUITS OPENINGS IN FLOOR/SLAB/WALL AFTER DEMOLITION. REFER TO ARCHITECTURAL PLANS FOR WALL RATINGS.	AA. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR HIS WORK. ALL CUTTING AND PATCHING SHALL BE IN ACCORD WITH THE ARCHITECTS STANDARDS FOR SUCH WORK. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. IF IN DOUBT, CONTACT THE ENGINEERS FOR CLARIFICATIONS PRIOR TO INSTALLING ANY SUCH WORK.
F. COORDINATE EXACT PHASING OF ALL WORK WITH GENERAL CONTRACTOR.	AB. INTERRUPTION OF ANY EXISTING SERVICES SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR, UTILITY COMPANY AS NECESSARY, AND THE ARCHITECT, AT LEAST TWO WEEKS IN ADVANCE OF THE ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED, TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED TWO WEEKS IN ADVANCE, IN WRITING. IF UTILITY COMPANY REQUIRES A LONGER NOTIFICATION PERIOD, SO PROVIDE.
G. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT MOUNTING LOCATION AND CONNECTION REQUIREMENTS OF ALL PLUMBING/MECHANICAL EQUIPMENT WITH PLUMBING/MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.	AC. WHERE EXIT SIGNS OR EMERGENCY BATTERY PACKS ARE PROVIDED THEY SHALL BE CONNECTED TO AN UNSWITCHED LINE.
H. ALL DEVICES AND JUNCTION BOXES SHALL BE ACCESSIBLE. PROVIDE ACCESS PANEL AS REQUIRED WITH PRIOR APPROVAL OF ARCHITECT.	AD. ALL MATERIALS FURNISHED AND ALL WORK INSTALLED SHALL COMPLY WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODES, NATIONAL FIRE CODES OF THE NATIONAL FIRE PROTECTION ASSOCIATION, THE REQUIREMENTS OF LOCAL UTILITY COMPANIES, AND WITH THE REQUIREMENTS OF ALL GOVERNMENTAL AGENCIES OR DEPARTMENTS HAVING JURISDICTION. IF ANY CONFLICTS OR DISCREPANCIES OCCUR THE MOST STRINGENT SHALL APPLY.
I. WHERE MORE THAN ONE SWITCH OR DIMMER OCCURS AT A LOCATION, GANG THE SWITCHES TOGETHER WITH A COMMON JUNCTION BOX AND FACE PLATE.	AE. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED.
J. ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF LIGHT FIXTURES WITH MECHANICAL CONTRACTOR, PLUMBING CONTRACTOR AND FIRE PROTECTION CONTRACTOR TO AVOID CONFLICT WITH DUCTWORK, PIPING AND SPRINKLER PIPING.	AF. DO NOT SCALE FROM DRAWINGS, AS PRINTING DISTORTS SCALE. WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONS SUPPLIED TO THE CONTRACTOR.
K. CONDUCTORS SHALL BE COPPER, RATED NOT LESS THAN 600VOLTS, MINIMUM WIRE SIZE SHALL BE #12 AWG, TYPE THHN OR THWN UNLESS OTHERWISE NOTED.	AG. INSTALL EQUIPMENT, MATERIALS, ETC., IN STRICT ACCORD WITH MANUFACTURERS' RECOMMENDATIONS AND DIRECTIONS.
L. TELEPHONE, FIRE ALARM, DATA, COMMUNICATIONS AND OTHER LOW VOLTAGE WIRING SHALL BE PLENUM RATED IF CONDUCTORS PASS THROUGH AN AIR PLENUM.	AH. THE PURPOSE AND INTENT OF ALL OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, SAFE, LIKE NEW FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE.
M. DISCONNECT SWITCHES SHALL BE MOUNTED ON INDIVIDUAL STRUCTURAL SUPPORTS, OR OTHERWISE DIRECTLY ON EQUIPMENT, PROVIDED NO MODIFICATION TO EQUIPMENT IS NECESSARY. ALL STRUCTURAL SUPPORTS FOR ELECTRICAL EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL INCLUDE DESIGN FOR ALL STRUCTURAL SUPPORT.	AI. ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ENGINEER.
N. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BALANCING ALL BRANCH CIRCUITS AMONG THE PHASES OF THE SYSTEM ACCORDING TO NEC AND PROVIDE LOAD BALANCING REPORT TO ENGINEER	AJ. CHECK ALL THREE PHASE MOTORS WITH 0 ROTATION METER, PRIOR TO PLACING IN SERVICE.
O. ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT SHALL BE WEATHERPROOF TYPE NEMA 3R.	AK. WHERE PENETRATING NEW ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. ROOFING CONTRACTOR SHALL MAKE ALL ROOF PENETRATIONS.
P. EMERGENCY LIGHTING, IF SWITCHED, SHALL AUTOMATICALLY ILLUMINATE DURING A POWER OUTAGE.	AL. CEILING-MOUNTED ELECTRICAL DEVICES SHALL BE CENTERED IN 2' X 2' CEILING TILE AND INSTALLED CENTERED ON 2' DIMENSION OF 2' X 4' TILE AND ON CENTERLINE OR A QUARTER POINT ON 4' DIMENSION, AS INDICATED.
Q. ELECTRICAL CONTRACTOR SHALL ARRANGE FOR A JOB WALK-THROUGH WITH THE BUILDING AND FIRE DEPARTMENT INSPECTORS TO DETERMINE IF ANY ADDITIONAL EXIT SIGNS ARE REQUIRED PRIOR TO COVER UP. VERIFY ARROW REQUIREMENTS.	AM. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEMS, CONTACT THE ENGINEERS BEFORE AFFECTING INSTALLATION. REFER ALSO TO ARCHITECTURAL WALL, INTERIOR AND EXTERIOR WALL ELEVATIONS, CEILING HEIGHTS, AND OTHER DETAILS OF THESE DOCUMENTS, AS APPLICABLE.
R. PROVIDE PULL WIRE IN EACH EMPTY RACEWAY.	AN. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY, COUNTY, LOCAL, STATE, FEDERAL, MUNICIPALITY, UTILITY COMPANY, OSHA, ETC.)
S. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT SLEEVES FOR CABLE ROUTING, AS NECESSARY, IN WALLS, FLOORS AND CEILINGS.	AO. INSTALL NO PIPING, CONDUIT, DUCTWORK, ETC., IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING AND THE COLLECTION OF CONDENSATION THEREON.
T. ELECTRICAL CONTRACTOR SHALL PROVIDE A TYPED LEDGER/CIRCUIT DIRECTORY IN PANELBOARD INDICATING TYPE OF LOAD AND LOCATION FOR EACH BRANCH CIRCUIT BREAKER. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL PANELBOARDS & DISCONNECT SWITCHES, UNLESS OTHERWISE NOTED.	
U. ALL ELECTRICAL COMPONENTS OR EQUIPMENT SHALL BE LABELED BY UNDERWRITER'S LABORATORIES OR OTHER APPROVED LISTING AGENCY. APPROVED AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT. UNLESS WAIVED BY THE ENGINEER IN WRITING.	
V. ALL WIRING SYSTEMS SHALL BE INSTALLED WITH A MINIMUM OF SPLICES. CONDUCTORS, WHETHER SINGLE OR MULTI-PAIR SHALL BE INSTALLED CONTINUOUS INsofar AS POSSIBLE FROM TERMINAL POINT TO TERMINAL POINT.	
W. CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO INSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE OR SUB-SERVICE FOR SAFETY PURPOSES. PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, TYPE, ETC., OF EACH UNDERGROUND OR OVERHEAD UTILITY. ALL WORK SHALL BE PERFORMED IN ACCORD WITH ALL FEDERAL, STATE AND/OR LOCAL RULES, REGULATIONS, STANDARD AND SAFETY REQUIREMENTS. UTILITIES SHALL	

LUMINAIRE SCHEDULE									
FIXTURE TYPE	DESCRIPTION	CATALOG NUMBER	LAMP	VOLTAGE	INPUT WATTS	BALLAST	LENS/REFLECTOR	MOUNTING	REMARKS
E1	4' LED SURFACE MOUNTED DECORATIVE LINEAR WRAP WITH DIMMING	COLUMBIA LIGHTING # RLW4-30ML-FA-W-ED-U	LED 3000K, 80 CRI, 5300 LUMENS	120	40	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SURFACE	
E2	2'X4' LED FLAT PANEL SURFACE MOUNTED	ORACLE LIGHTING # 24-FPLE-LED-5000L-DIM10-MVOLT-35K-85 24-FPL1-LED-SMK	LED 3500K, 85 CRI, 5000 LUMENS	120	51	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SURFACE	
E3	1'X4' LED FLAT PANEL SURFACE MOUNTED	ORACLE LIGHTING # 14-FPL1-LED-4000L-DIM10-MVOLT-35K-85 14-FPL1-LED-SMK	LED3500K, 85 CRI, 4000 LUMENS	120	30	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SURFACE	
E4	2'X4' LED HIGH BAY SURFACE / SUSPENDEd WITH SUSPENSION CABLE/KIT	ELITE LIGHTING # CB2-LED-18000L-DIM10-MVOLT-WD-40K-85 GSS	LED4000K, 85 CRI, 18000 LUMENS	120	139	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SUSPENDED	
E5	4' LED SURFACE OR SUSPENDED LINEAR STRIP WITH SUSPENSION CABLE/KIT	ORACLE LIGHTING # 4-OIC1-LED-4000L-DIM10-MVOLT-35K-80 OCGSS	LED 3500K, 80 CRI, 4000 LUMENS	120	46	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SURFACE/ SUSPENDED	
E6	4' LED VAPOR TIGHT IP 65 RATED, SUITABLE FOR WET LOCATION SURFACE OR SUSPENDED WITH SUSPENSION CABLE/KIT	ORACLE LIGHTING # 4-OWS-LED-4000L-DIM10-MVOLT40K-85-SSL-GSS	LED 4000K, 85 CRI, 4000 LUMENS	120	40	ELECTRONIC DRIVER 0-10V DIM	FROSTED ACRYLIC	SURFACE/ SUSPENDED	
E7	LED MEDIUM FULL CUT OFF WALL PACK WET LOCATION LISTED BRONZE FINISH	ORACLE LIGHTING # OWP-FC-201-LED-4500L-MVOLT-40K-BZ-FSP-305RC	LED 4000K, 85 CRI, 4900 LUMENS	120	46	ELECTRONIC DRIVER	FROSTED ACRYLIC	SURFACE/ WALL	
E8	LED OUTDOOR FLOODLIGHT	HUBBELL LIGHTING - MARSHAL LED TWIN ML-2L3K-1-DB-MS-DB	LED 3000K, 83 CRI, 2104 LUMENS	120	26.6	ELECTRONIC DRIVER	-	SURFACE/ WALL	
RH	EXTERIOR REMOTE HEAD- EMERGENCY EGRESS LIGHT	HUBBELL LIGHTING COMPAS #CORD	LED	120	1	-	ACRYLIC	SURFACE/ WALL	
EM	WALL MOUNTED LED EMERGENCY LIGHT, WHITE FINISH LOW PROFILE HOUSING, NI-CAD BATTERY CAPABLE OF 90 MINUTES OF ILLUMINATION BUILT IN TEST SWITCH	HUBBELL LIGHTING COMPAS #CU2	LED	120	5	-	ACRYLIC	SURFACE	
EX	LED EXIT SIGN WITH THERMO PLASTIC HOUSING, WHITE FINISH AND RED LETTERING. PROVIDE ARROWS AS NOTED ON DRAWINGS AND SINGLE OR DOUBLE SIDED AS NEEDED AND AS SHOWN ON DRAWINGS. PROVIDE TOP, BACK, OR SIDE MOUNT HARDWARE AS REQUIRED BY ARCHITECTURAL CONDITIONS. BATTERY CAPABLE OF 90 MINS OF EMERGENCY OPERATION	HUBBELL LIGHTING COMPAS #CCRRC	LED	120	5	-	ACRYLIC	SURFACE / WALL / CEILING	PROVIDE REMOTE CAPABLE - CORD AT EXTERIOR DOORS
X1	LED EXIT SIGN WITH BATTERY PACK WHITE THERMOPLASTIC WITH RED LED WITH REMOTE CAPACITY	HUBBELL LIGHTING COMPAS #CERRC	LED	120	5	-	ACRYLIC	UNIVERSAL MOUNTING	

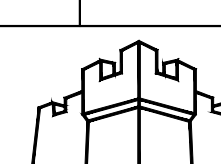
DRAWING INFORMATION		FFA CABIN, SHOP & MISC. CONSTRUCTION	
A&E FILE NO.	2019-24	ELECTRICAL GENERAL INFORMATION	
DRAWING DATE:	05/11/2020	DRAWING NO.	E001
DRAWN BY:	JM	ACCOUNT NO.	540-C97Q-FF19-00
CHECKED BY:	JM	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY	DECA REVIEWED
PHASE	RTA		FOR INTENT ONLY
RTA DATE:	5/11/2020		DECA LOG #
STAMP:			A1C-6927
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REVISION HISTORY OF THIS DRAWING			
DESCRIPTION OF REVISIONS	DATE	DESCRIPTION OF REVISIONS	DATE
1		5	
2		6	
3		7	
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- A. THE LOCATION OF UNDERGROUND UTILITIES SHOWN WERE DIVERSED INFORMATION PROVIDED BY OTHERS. LOCATIONS ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED AND COORDINATED WITH ALL UTILITY COMPANIES AND CIVIL DRAWINGS PRIOR TO ANY CONSTRUCTION ON SITE.
- B. ELECTRICAL CONTRACTOR SHALL MAKE CONTACT WITH ELECTRIC SERVICE PROVIDER FOR ACTUAL LOCATION OF CONNECTION POINTS.
- C. ALL THE DEVICE COVERPLATES WITHIN THE CABIN SHALL BE STAINLESS STEEL TYPE.
- D. ALL THE DUPLEX RECEPTACLES WITHIN THE CABIN SHALL BE TAMPER RESISTANT USB RECEPTACLE (LEVITON # M588 OR EQUAL).
- E. PROVIDE PULL WIRE IN EACH EMPT CONDUIT.
- F. ALL EXTERIOR ELECTRICAL DEVICES AND EQUIPMENT SHALL BE WEATHERPROOF TYPE NEMA 3R.
- G. ALL ELECTRICAL COMPONENTS OR EQUIPMENT SHALL BE LABELED BY UNDERWRITER'S LABORATORIES OR OTHER APPROVED LISTING AGENCY. APPROVED AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT.
- H. ALL WIRING SYSTEMS SHALL BE INSTALLED WITH A MINIMUM OF SPLICES. CONDUCTORS, WHETHER SINGLE OR MULTI-PAIR SHALL BE INSTALLED CONTINUOUS INsofar as POSSIBLE FROM TERMINAL POINT TO TERMINAL POINT.
- I. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED.
- J. ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THE CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDED WITH THE ENGINEER.

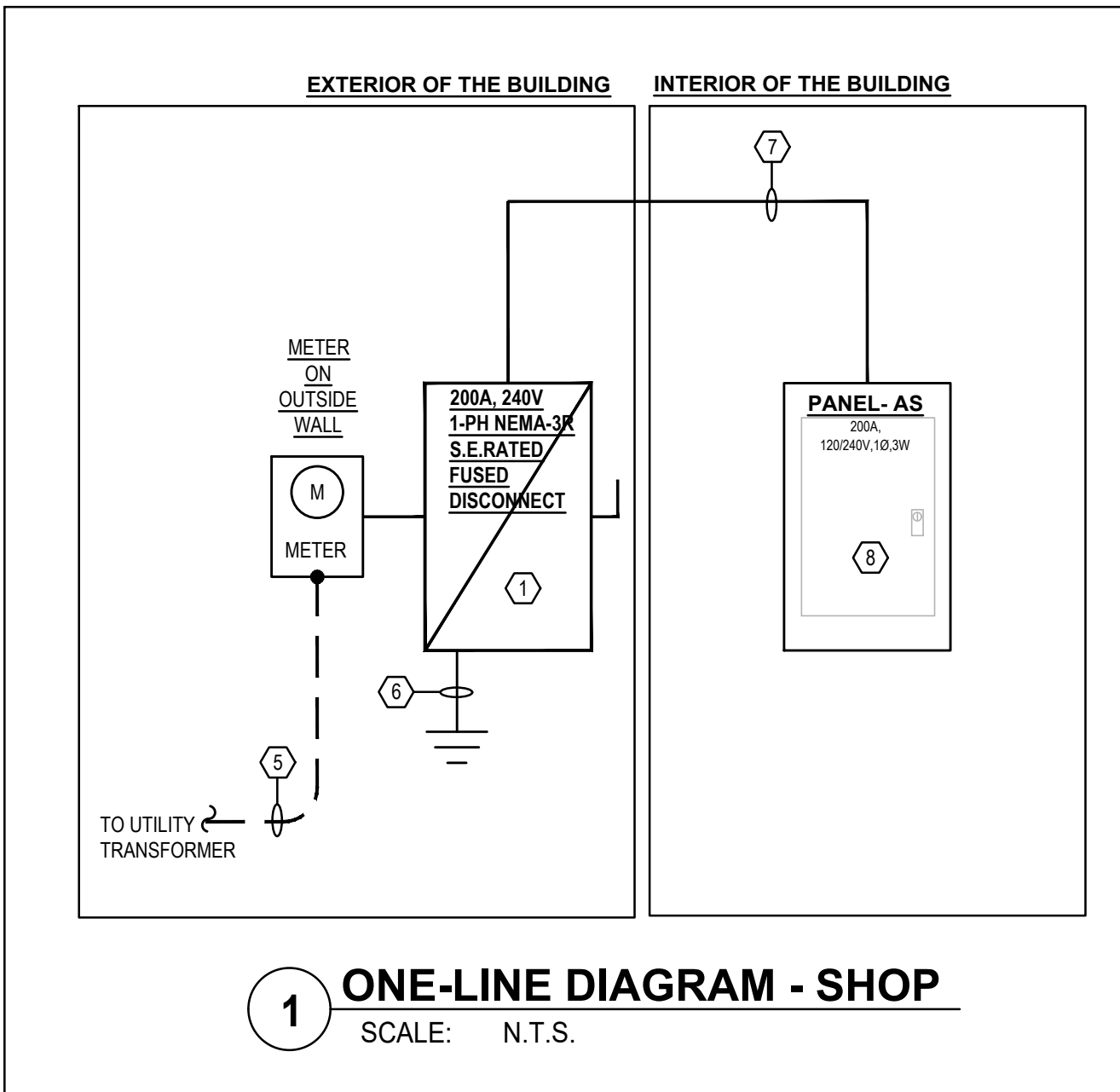
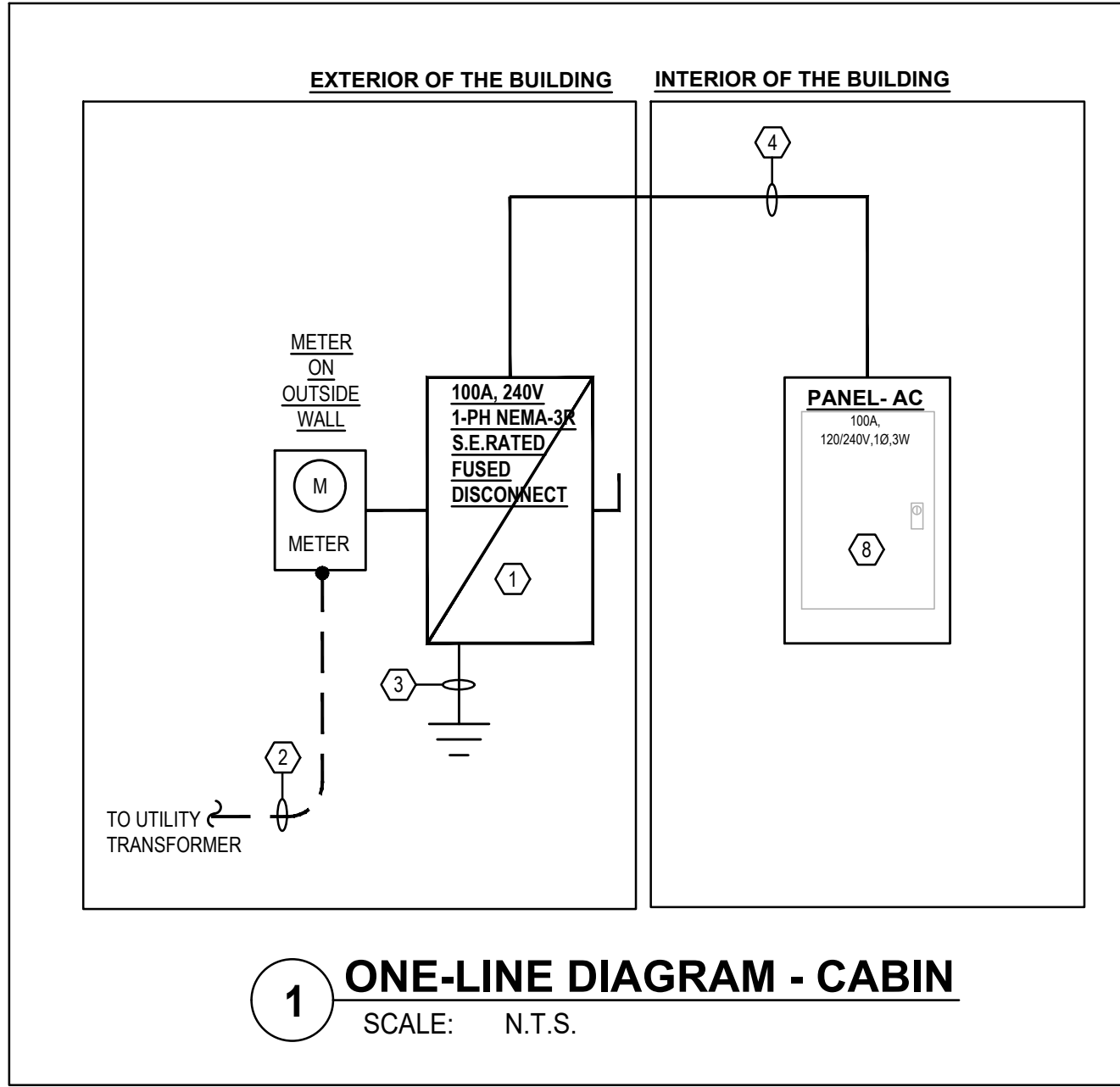
1. VERIFY THE EXACT LOCATION OF METER WITH THE ELECTRIC SERVICE PROVIDER.
2. VERIFY THE EXACT LOCATION OF HVAC EQUIPMENT WITH THE MECHANICAL CONTRACTOR.
3. FURNISH AND INSTALL 240V, 30 AMP, FUSIBLE TYPE NEMA 3R DISCONNECT SWITCH.
4. FURNISH AN INSTALL JUNCTION BOX WITH A MOTOR RATED TOGGLE SWITCH.
5. VERIFY THE EXACT LOCATION OF THE DIMMER SWITCH FOR THE LIGHT WITH THE ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
6. EXTEND THE UNDERGROUND PRIMARY CONDUIT TO THE ELECTRIC SERVICE PROVIDER TRANSFORMER MINIMUM 36 INCHES BELOW GRADE. VERIFY THE EXACT SIZE AND ROUTING OF THE CONDUIT WITH THE ELECTRIC SERVICE PROVIDER.
7. SERVICE ENTRANCE RATED MAIN SERVICE DISCONNECT SWITCH.
8. ALL DUPLEX RECEPTACLES WITHIN THE CABIN SHALL BE COMMERCIAL GRADE, 20 AMP, USB CHARGER/TAMPER RESISTANT TYPE. TYPICAL..
9. ALL THE DEVICE COVERPLATES WITHIN THE CABIN SHALL BE STAINLESS STEEL TYPE. TYPICAL..

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	A&E FILE NO.	2019-24	NEW CABINS - ELECTRICAL PLANS				DRAWING NO.
	DRAWING DATE:	05/11/2020	ACCOUNT NO. 540-C97Q-FF19-00	COMMONWEALTH OF KENTUCKY FINANCE AND ADMINISTRATION CABINET DEPARTMENT FOR FACILITIES AND SUPPORT SERVICES DIVISION OF ENGINEERING AD CONTRACT ADMINISTRATION FRANKFORT, KENTUCKY		E101	
	DRAWN BY:	JM					
	CHECKED BY:	JM					
	PHASE	RTA					
	RTA DATE:	5/11/2020					
	STAMP:			<div></div>		DECA REVIEWED	
			FOR INTENT ONLY				
			DECA LOG #				
		A1C-6928					
		10109 Headley Hill RD Louisville, KY 40223 502-541-5352	<div></div> <div>E. JEFFREY@RAMPARTENGINEERING.COM</div>		REVISION HISTORY OF THIS DRAWING		
		DATE			DATE		
		DESCRIPTION OF REVISIONS	DATE	DATE	DATE	DATE	
		1		5			
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- ### ONE-LINE DIAGRAM NOTES
- VERIFY THE EXACT UTILITY REQUIREMENTS AND LOCATION FOR THE METER AND SERVICE ENTRANCE RATED DISCONNECT IN THE FIELD AND COORDINATE WITH THE ELECTRIC SERVICE PROVIDER.
  - THREE (3) #2 AWG CU IN 2" CONDUIT. EXTEND THE UNDERGROUND PRIMARY CONDUIT TO THE ELECTRIC SERVICE PROVIDER TRANSFORMER MINIMUM 36 INCHES BELOW GRADE. VERIFY THE EXACT ROUTING OF THE CONDUIT WITH THE ELECTRIC SERVICE PROVIDER.
  - #8 COPPER GROUNDING ELECTRODE CONDUCTOR BONDED TO BUILDING STEEL, WATER SERVICE AND DRIVEN GROUND ROD.
  - THREE (3) #2 AWG AND ONE (1) #8 GROUND IN 1-1/2" CONDUIT.
  - THREE (3) #3/0 AWG CU IN 2-1/2" CONDUIT. EXTEND THE UNDERGROUND PRIMARY CONDUIT TO THE ELECTRIC SERVICE PROVIDER TRANSFORMER MINIMUM 36 INCHES BELOW GRADE. VERIFY THE EXACT ROUTING OF THE CONDUIT WITH THE ELECTRIC SERVICE PROVIDER.
  - #4 COPPER GROUNDING ELECTRODE CONDUCTOR BONDED TO BUILDING STEEL, WATER SERVICE AND DRIVEN GROUND ROD.
  - THREE (3) #3/0 AWG AND ONE (1) #6 GROUND IN 2-1/2" CONDUIT.
  - ELECTRICAL CONTRACTOR SHALL PROVIDE A DEDUCT PER SUBMITTED SCHEDULE OF VALUES/UNIT PRICING IF THE PANELBOARDS ARE PROVIDED AS MAIN LUG ONLY IN LIEU OF MAIN CIRCUIT BREAKER TYPE. IF IT IS ACCEPTABLE TO THE OWNER TO PROVIDE THE MAIN SERVICE DISCONNECT OUTSIDE THE BUILDING.

PANEL AC (CABIN)										
MAIN BUS:		100 AMP		MCB		A/C:		22,000 AMPS		
VOLTAGE:		240 /120 VOLT, 1P, 3W				MOUNTING: SURFACE				
LOCATION:		CABIN				FED FROM: UTILITY				
NOTE:										
DESCRIPTION	CIRCUIT VA	TRIP/ POLE	OPTION	PHASE			OPTION	TRIP/ POLE	CIRCUIT VA	DESCRIPTION
RECEPT ACLES- NORTH WALL	720	20/1	A	1	A	2	A	20/1	360	LIGHTING
RECEPT ACLES- NORTH WALL	720	20/1	A	3	B	4		20/2	1200	CU-101
RECEPT ACLES- SOUTH WALL	720	20/1	A	5	C	6		-	1200	-
RECEPT ACLES- SOUTH WALL	720	20/1	A	7	A	8	20/2	1200	1200	CU-102
RECEPT ACLES- EAST WALL	720	20/1	A	9	B	10		-	1200	-
RECEPT ACLES- ENTRANCE	720	20/1	A	11	C	12	20/1	100	100	CCU-101
SMOKE ALARM	200	20/1		13	A	14	20/1	100	100	CCU-102
	0	20/1		15	B	16	20/1	0	0	
	0	20/1		17	C	18	20/1	0	0	
	0	20/1		19	A	20	20/1	0	0	
	0	20/1		21	B	22	20/1	0	0	
	0	20/1		23	C	24	20/1	0	0	
	0	20/1		25	A	26	20/1	0	0	
	0	20/1		27	B	28	20/1	0	0	
	0	20/1		29	C	30	20/1	0	0	
CONNECTED KVA:				10 KVA						
CONNECTED AMPS:				41.17 AMPS						
G - INDICATES GROUND FAULT CIRCUIT INTERRUPTER										
A - INDICATES ARC FAULT CIRCUIT INTERRUPTER										
ST - INDICATES SHUNT TRIP										
E - INDICATES EXISTING										

PANEL AS (SHOP)									
MAIN BUS:		200 AMP		MCB		A/C: 42,000 AMPS			
VOLTAGE:		240 /120 VOLT, 3P, 4W				MOUNTING: SURFACE			
LOCATION:		OFFICE				FED FROM: UTILITY			
NOTE:									
DESCRIPTION	CIRCUIT VA	TRIP/ POLE	OPTION	PHASE		OPTION	TRIP/ POLE	CIRCUIT VA	DESCRIPTION
LIGHTING SHOP 1010	840	20/1		1	A	2	30/2	2870	PTAC-101
LIGHTING SHOP 1010	700	20/1		3	B	4	-	2870	-
CANOPY LIGHTING	200	20/1		5	C	6	20/2	1250	WATER HEATER WH-1
OFFICE AND MEZZ LIGHTING	628	20/1		7	A	8	-	1250	-
WELDER RECEPTACLE	4160	50/2		9	B	10	20/1	100	EF-1
-	4160	-		11	C	12	20/1	1440	RECEPTACLES- MEZZ
WELDER RECEPTACLE	4160	50/2		13	A	14	20/1	500	DEDICATED RECEPT-FUTURE IT
-	4160	-		15	B	16	20/1	1080	OFFICE RECEPTACLE
WELDER RECEPTACLE	4160	50/2		17	C	18	20/1	360	BENCH RECEPTACLE
-	4160	-		19	A	20	20/1	360	BENCH RECEPTACLE
DEDICATED RECEPT- COMPRES.	1200	20/1		21	B	22	20/1	1080	RECEPTACLES -SHOP, TOILET
SPARE		20/1		23	C	24	20/1	900	RECEPTACLES -SHOP
SPARE		20/1		25	A	26	20/1	1080	RECEPTACLES -SHOP
SPARE		20/1		27	B	28	20/1	540	RECEPTACLES -SHOP
SPARE		20/1		29	C	30	20/1		SPARE
SPARE		20/1		31	A	32	20/1		SPARE
SPARE		20/1		33	B	34	20/1		SPARE
SPARE		20/1		35	C	36	20/1		SPARE
SPARE		20/1		37	A	38	20/1		SPARE
SPARE		20/1		39	B	40	20/1		SPARE
SPARE		20/1		41	C	42	20/1		SPARE
CONNECTED KVA:				44 KVA					
CONNECTED AMPS:				184.2 AMPS					
G - INDICATES GROUND FAULT CIRCUIT INTERRUPTER									
A - INDICATES ARC FAULT CIRCUIT INTERRUPTER									
ST - INDICATES SHUNT TRIP									
E - INDICATES EXISTING									

COPPER (CU) BRANCH CIRCUIT AND FEEDER SCHEDULE						
OVERCURRENT PROTECTIVE DEVICE RATING (AMPS)	CONDUCTOR SIZE PER CONDUIT		CONDUIT SIZE AND QUANTITY			
	PHASE & NEUTRAL	EQUIPMENT GROUND	1P, 1N, 1G 2P, 1G	2P, 1N, 1G 3P, 1G	3P, 1N, 1G	3P, 3N, 1G
15-20	12	12	3/4"	3/4"	3/4"	3/4"
25	12	10	3/4"	3/4"	3/4"	3/4"
30-35	10	10	3/4"	3/4"	3/4"	3/4"
40-50	8	10	3/4"	3/4"	3/4"	1"
60	6	10	3/4"	3/4"	1"	1"
70-80	4	8	3/4"	1"	1-1/4"	1-1/4"
90-100	3	8	1"	1"	1-1/4"	1-1/2"
110	2	6	1"	1-1/4"	1-1/4"	1-1/2"
125	1	6	1-1/4"	1-1/4"	1-1/2"	2"
150	1/0	6	1-1/4"	1-1/2"	1-1/2"	2"
175	2/0	6	1-1/4"	1-1/2"	2"	2-1/2"
200	3/0	6	1-1/2"	2"	2	2-1/2"
225	4/0	4	1-1/2"	2"	2-1/2"	3"
250	250	4	2"	2"	2-1/2"	3"
300	350	4	2"	2-1/2"	3"	3-1/2"

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10109 Headley Hill RD Louisville, KY 40223 502-541-5352		 RAMPART ENGINEERING E: JEFFREY@RAMPARTENGINEERING.COM		REVISION HISTORY OF THIS DRAWING	
DESCRIPTION OF REVISIONS		DATE	5	DESCRIPTION OF REVISIONS	DATE
1			5		
2			6		
3			7		
4			8		