

**LAKE CO. CLERK OF COURTS**

**TITLE CENTRAL  
8804 MENTOR, AVE.  
MENTOR, OH 44060**

**GENERAL REQUIREMENTS  
AND SPECIFICATIONS**

**OWNER:**

LAKE COUNTY BOARD OF COMMISSIONERS  
105 MAIN ST.  
PAINESVILLE, OHIO 44077

**ARCHITECT**

JOSEPH L. MYERS ARCHITECT, INC.  
38030 SECOND STREET  
WILLOUGHBY, OHIO 44094  
(440) 975-1800

**MECHANICAL &  
ELECTRICAL DESIGN**

TEC INC.  
33851 CURTIS BLVD., SUITE 216  
EASTLAKE, OH 44095  
(440) 953-8760

LAKE COUNTY COMISSIONERS

**PRESENTS**

**INVITATION TO BID FOR  
BUILDING RENOVATIONS AND IMPROVEMENTS  
FOR THE LAKE COUNTY CLERK OF COURTS**

Title Central  
8804 Mentor Ave.  
Mentor, Ohio 44060

Lake County Commissioners

**BID OPENING TIME: 11:00 A.M.**

NAME AND ADDRESS OF FIRM AND CONTACT PERSON SUBMITTING BID

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**(CONTRACTOR TO COMPLETE ABOVE INFORMATION)**

**COUNTY OF LAKE  
105 MAIN STREET  
PAINESVILLE, OHIO 44077**

**CONTENTS:**

I.	LEGAL NOTICE	PAGE LN-1-2
II.	INSTRUCTIONS TO BIDDERS	PAGE IB-1-7
III.	CORPORATE RESOLUTION	PAGE CR-1
IV.	SIGNATURE PAGE	PAGE SP-1
V.	PROPOSAL-CONTRACT FORM	PAGE PC-1-2
VI.	SUPPLEMENTARY CONDITIONS	PAGE SC-1-3
VII.	SPECIFICATIONS	PAGE SPEC-1-2

**A. DIVISION 1 - GENERAL REQUIREMENTS**

Section 0160	Summary of Work	0160-1-2
Section 0165	Temporary Facilities	0165-1-3
Section 0170	Project Closeout	0170-1-4
Section 0175	Cleaning	0175-1-2
Section 0180	Cutting and Patching	0180-1-2

**B. DIVISION 5 - METALS**

Section 0540	Light Gauge Steel Framing	0540-1-2
--------------	---------------------------	----------

**C. DIVISION 6 - WOOD AND PLASTICS**

Section 0600	Lumber and Millwork	0600-1-2
Section 0620	Finish Carpentry	0620-1

**D. DIVISION 7 - THERMAL AND MOISTURE PROTECTION**

Section 0721	Building Insulation	0721-1
Section 0792	Sealants/Caulking	0792-1

**E. DIVISION 8 - DOORS AND WINDOWS**

Section 0810	Metal Doors and Frames	0810-1-2
Section 0811	Wood Doors	0811-1-4

**F. DIVISION 9 - FINISHES**

Section 0925	Gypsum Wallboards	0925-1-2
Section 0945	Ceramic Floor Tile	0945-1-4
Section 0950	Suspended Acoustic Tile Ceiling	0950-1
Section 0990	Painting	0990-1-2

**G. DIVISION 10 – SPECIALTIES**

Section 1080 Toilet Partition	1080-1-3
Section 1090 Toilet Room Accessories	1090-1-2

**H. DIVISION 12-FURNISHINGS**

Section 1230 Casework	1230-1-3
-----------------------	----------

**I. DIVISION 15 – MECHANICAL**

Section 15010 Mechanical General Provisions	10510-1-9
Section 15050 Common Work Results for Plumbing	15050-1-10
Section 15250 Plumbing Insulation	15250-1-3
Section 15251 HVAC Insulation	15251-1-3
Section 15410 Plumbing Fixtures	15410-1-3
Section 15430 Facility Plumbing Equipment	15430-1-2
Section 15800 HVAC Air Distribution	15800-1-5
Section 15950 Testing, Adjusting, & Balancing for HVAC	15950-1-8

**J. DIVISION 16 – ELECTRICAL**

Section 16010 General Requirements	16010-1-10
Section 16020 Electrical Demolition	16020-1-3
Section 16416 Panelboards	16416-1-4
Section 16519 Conductors	16519-1-2
Section 16520 Metal Clad Cable	16520-1-2
Section 16526 Grounding	16526-1-2
Section 16530 Wiring Devices	16530-1-3
Section 16533 Raceways	16533-1-5
Section 16534 Pathways for Communications Systems	16534-1-2

VIII. NON-COLLUSION AFFIDAVIT	PAGE NCA-1
IX. NON-DISCRIMINATION AFFIDAVIT	PAGE EEO-1
X. STATEMENT AS TO DELINQUENT TAXES	PAGE DT-1
XI. PREVAILING WAGE REQUIREMENTS	PAGE PWR 1-13

**COUNTY OF LAKE**

**DATE OF BID OPENING: July 29<sup>th</sup>, 2015**

ALL OF THIS BOUND INFORMATION MUST BE KEPT INTACT AND TOGETHER WITH ANY ADDENDA ISSUED, AND MUST BE RETURNED WITH THE BID. OTHERWISE THE BID MAY BE CONSIDERED INFORMAL.

ALL BIDS SUBMITTED MUST INCLUDE THE REQUIRED BID BOND AND A PROPERLY EXECUTED SIGNATURE PAGE (SP-1).

ANY INFORMATION REGARDING THESE SPECIFICATIONS, PLEASE CONTACT:

**ARCHITECT**

JOSEPH L. MYERS ARCHITECT, INC.  
38030 SECOND STREET  
WILLOUGHBY, OHIO 44094  
(440) 975-1800

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I

**LEGAL NOTICE TO BIDDERS**

Sealed bids will be received by the Board of County Commissioners in and for Lake County at their office in the Lake County Administration Center, 105 Main Street, Painesville, Ohio 44077; up to the hour of 11:00 AM local time on Wednesday, the 29<sup>th</sup> day of July in the year 2015, and read publicly immediately following in the Commissioners' Chambers at the above address, for the following improvement project:

**LAKE COUNTY CLERK OF COURTS: TITLE CENTRAL**

Estimate of Cost: \$250,000

Said contract shall be in accordance with specifications and bid form on file with the Clerk of the Board of County Commissioners. The Bid Package may be obtained from the Lake County Board of Commissioners, 105 Main Street, 4<sup>th</sup> Floor, Painesville, OH 44077, between the hours of 8:00 AM and 4:30 PM, Mondays through Fridays.

The work covered by the plans and specifications includes: REMODELING OF EXISTING OFFICE SPACE IN AN EXISTING OFFICE COMPLEX TO SERVE AS A TITLE BUREAU. WORK INCLUDES METAL STUD FRAMING, NEW FINISHES, ADJUSTMENTS TO ELECTRICAL, AND RESTROOM WORK. It is expected that the work will be completed as soon as possible.

Bids shall be addressed to the Board of Lake County Commissioners, Lake County Administration Center, 105 Main Street, Painesville, Ohio 44077, and marked as BID FOR "**TITLE CENTRAL**".

Pursuant to R.C. 153.54 et. seq., the bid must be accompanied by an original sealed document in the form of a bond for the full amount (100%) of the bid, **OR** by a certified check, cashier's check, or irrevocable letter of credit equal to ten percent (10%) of the amount bid, drawn on a solvent bank located in Lake County and payable to the Treasurer of Lake County, Ohio, as surety that if the proposal is accepted, a contract will be entered into and its performance properly secured. Should any bid be rejected the surety will be returned to the bidder and should any bid be accepted such bid bond, certified check, cashier's check, or letter of credit will be returned to the bidder upon proper execution and securing of the contract.

No bidder shall be considered lowest and best bidder or eligible to be awarded the contract to which this Notice or Bid Specifications apply if the bidder is listed on the Auditor of State's Database as having a "Finding of Recovery" as that term is defined in R.C. 9.24.

A pre-bid meeting will be held on Thursday the 16<sup>th</sup> day of July 2015, at 10:00 A.M. at the proposed Title Bureau space at 8804 Mentor Ave., Mentor, OH.

Bids shall be subject to the conditions that the right is reserved to hold bids for a period not longer than sixty (60) days after date of bid opening and/or to award the contract at any time during said period.

The successful bidder will be required to execute the contract within ten (10) days after the award of the work to him/her, and he/she shall furnish acceptable bond or surety, if not filed previously to the satisfaction of the County of Lake, Ohio for the faithful performance of said contract in the sum of one hundred percent (100%) of the total amount of the bid. In case of failure to execute the contract as stated or to furnish bond and/or surety, the bidder shall be considered to have abandoned the contract and is then liable for the difference between his/her bid and the next lowest bid, not to exceed ten percent (10%) of the amount bid.

The County reserves the right to reject any or all bids, or to increase or decrease or omit any item or items and/or to award to the lowest and/or best bidder. Each proposal must contain the full name of every person or company interested in the same.

Bidders may also access this Legal Notice to Bidders via the internet at [www.lakecountyohio.gov](http://www.lakecountyohio.gov), click on **Legal Notices to Bidders** tab in the center of the page to link to the Legal Notices site.

BY ORDER OF THE BOARD OF COUNTY COMMISSIONERS in and for Lake County, Ohio.

Daniel P. Troy, President  
Judy Moran, Vice President  
Kevin D. Malecek, Commissioner  
Jen Bell, Clerk

PUBLISH: **THE NEWS HERALD**

Friday, July 10, 2015

The Lake County Website

Bulletin Board at 105 Main Street, Painesville, OH

Bulletin Board at Clerk of Courts Office at 25 North Park Place, Lower Level, Painesville, OH

## II

### INSTRUCTIONS TO BIDDERS

1. Except as otherwise provided herein, the Instructions to Bidders, Proposal-Contract Form, and all specifications, drawings and other documents referred to herein shall be part of the contract.
2. DEFINITIONS:
  - A. The term “bidder” or “contractor” shall mean the corporation, partnership or individual proposing or under contract to furnish the material, labor and/or equipment listed in the specifications.
  - B. The term “County” shall mean the County of Lake.
  - C. “Calendar Day” shall mean everyday shown on the calendar.
  - D. “Clerk” shall mean the Clerk to the Lake County Board of Commissioners or her duly authorized representative.

3. PROPOSAL:

To be entitled to consideration, a proposal must be made in accordance with the following instructions:

- A. Preparations: Each shall be submitted in duplicate on the forms furnished by the County. All signatures shall be clearly and legibly written in long hand. No oral, telegraphic or telephonic proposal or modification will be considered. Each proposal shall show the breakdown for each item as directed on the Proposal-Contract Form. All bids shall be considered informal which contain items not specified on the Proposal-Contract Form.

Prices for the materials and equipment shall include hauling and delivery to any place designated on the County's purchase order, within the corporate limits of the County. In the event of a discrepancy between unit bid prices and extensions thereof, the unit bid shall govern.

- B. Names of Bidders: Each bid shall give the full business name and address of bidders and be signed by them with their usual signature. Bids by partnership shall furnish the full names of all partners and shall be signed with the partnership name by one of the partners of the partnership or by an authorized representative, followed by the signature and title of the person signing.

Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and title of the President, Secretary or other person authorized to bind it in the matter.

The name of each person signing shall also be typed or printed below the signature. A bid by a person who affixes to their signature the word "President", "Secretary", "Agent", or other title without disclosing their principal, may be held to be the bid of the individual signing. When requested by the County, satisfactory evidence of the authority of the officer or agent signing on behalf of a corporation or partnership shall be furnished.

- C. Delivery: The bid shall be sealed in an envelope addressed to:  
**Lake County Board of Commissioners**  
**County Clerk**  
**105 Main Street**  
**Painesville, Ohio 44077**

And delivered to the office of the Lake County Commissioner Department on the date set forth in the legal advertisement. The sealed envelope shall also bear the name of bidder, the general item or items bid on, and the date the bids are to be opened. Proposals will be received until the date and time specified in the legal advertisement. Bids will be opened and read immediately thereafter, in Commissioners Chambers, 4<sup>th</sup> Floor, Lake County Administration Center, 105 Main Street, Painesville, Ohio 44077.

- D. Bids to Include All Work: Each bid shall include all work described in the Instructions to Bidders, Specifications, and all drawings.
- E. Withdrawal of Proposal: Permission will not be given to withdraw or modify any proposal after it has been deposited as provided above. Negligence on the part of the bidder in preparing the bids confers no right for the withdrawal of the bid after it has been opened.
- F. Acceptance or Rejection of Proposal: The County reserves the right to accept proposals at any time within sixty (60) days after the same are opened as provided above. The County reserves the right to reject any or all bids. In determining the award, each item may be considered separately, and separate contracts may be awarded on the various items, unless specified to the contrary in the specifications.
- G. Proposal Bond or Check: Each proposal must be accompanied by a **Bid Bond** for the **Full Amount (100%)** of the bid, or by a certified check, cashier's check, or irrevocable letter of credit equal to **Ten Percent (10%)** of the amount bid, drawn on a solvent bank located in Lake County and payable to the Treasurer of Lake County, Ohio as surety that if the proposal is accepted, a contract

will be entered into and its performance properly secured. The Bid Guaranty shall comply with Ohio Revised Code 153.54.

- H. Complete Proposal: No bidder shall be considered the lowest and best bidder or eligible to be awarded the contract to which this bid applies unless the bidder has completed all forms, affidavit, certificates and documents that constitute this bidding document
  - I. Forfeiture of Check or Proposal Bond: If the bidder to whom the contract is awarded shall fail to honor the contract, or fail to sign any documents necessary to formalize the contract, if any, the deposit accompanying the proposal shall thereupon be forfeited to the County for and as liquidated damages. The work may then be re-advertised or awarded to the deemed second best bidder as the County may determine.
  - J. Quantities: The quantities of the work shown on the Specifications and Proposal-Contract are estimated by the County and will be used as the basis for comparison of the bids only. The County reserves the right to decrease or increase any quantities and to eliminate any item or items on the plans or proposals.
  - K. Informal Proposals: Proposals will be considered informal and may be rejected for the following reasons:
    - 1. If the proposal is on a form other than that furnished by the County or if the form is altered or any part thereof detached.
    - 2. If there are unauthorized additions, conditional or alternate bids or other irregularities of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.
    - 3. If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award. This does not exclude a bid limiting maximum gross amount of awards acceptable to any one bidder at any one letting, provided that any selection of awards will be made by the County.
    - 4. If the proposal does not contain a unit price for each pay items listed, except in the case of authorized alternate pay items or lump sum items.
4. COMPETENCY OF BIDDERS: No bid will be considered unless the bidder submitting the same furnishes evidence satisfactory to the County Clerk that they have the necessary equipment, ability and financial resources to fulfill the conditions of the contract and specifications. Previous experience and responsibility of the bidders will be considered

in awarding the contract. No contract will be awarded to any bidder who is in default as to surety or otherwise upon any obligation to the County.

- A. Disqualification of Bidders: Any of the following reasons may be considered as being sufficient for the disqualification of a bidder and the rejection of their proposal or proposals.
1. More than one proposal for the same work from an individual, firm, or corporation under the same or different names.
  2. Evidence of collusion among bidders. Participants in such collusion will receive no recognition as bidders for any further work of the County until any such participant shall have been reinstated as a qualified bidder.
  3. Bid prices which obviously are unbalanced.
  4. No bidder shall be considered a responsive and responsible bidder or eligible to be awarded the contract to which this bid specification apply, if the bidder is listed on the Auditor of State database as having a "Finding of Recovery" "that is resolved" as the term in defined in R.C. 9.24.
5. WRITTEN AND ORAL EXPLANATION: Should a bidder find discrepancies in, or omissions from, the drawings or specifications, or should they be in doubt as to their meaning, they shall notify the County, which may send written instructions to all bidders. The County will not be responsible for any oral instructions.
6. ADDENDUM OR MODIFICATION: Any addendum or modification issued during the time of bidding shall be covered in the proposal and in closing a contract such addendum or modification will become part thereof. In the event any such addendum or modification is issued by the County within 72 hours of the time set for the closing of bids, excluding Saturdays, Sundays, and legal holidays, the time for submitting bids shall be extended one week, with no further advertising of bids.
7. TAX EXEMPTIONS: The County is tax exempt from federal excise and transportation taxes and Ohio State sales tax. Prices quoted should not include either federal excise or Ohio sales tax. Tax exemption certificates covering these taxes will be furnished whenever necessary. The transportation tax is not applicable on any purchase cosigned to the County and no tax exemption certificate is required. If, for any reason, a contemplated purchase would not be tax exempt, this fact will be indicated in the specifications, and such taxes may be included on the price or shown as a separate item in the proposal.

8. DISCRIMINATION: In the hiring of employees for the performance of work under this contract or any subcontract, neither the contractor, subcontractor, nor any person acting in their behalf shall by reason of race, creed, color, age, sex, or handicap, discriminate against any citizen of the State in the employment of any laborer or worker who is qualified and available to perform the work to which the employment relates.
9. INSURANCE: Any bidder who is awarded this contract shall obtain and pay for liability insurance in a minimum amount of \$1,000,000 per occurrence, and shall name Lake County as an additional insured to protect the contractor and County against any claims arising out of any operations conducted in connection with the contract. The policy shall carry a rider giving a one-month cancellation notice to the County. This policy shall include contractual liability insurance as applicable to the contractor's obligations and shall name the County as an insured.
10. LIABILITY: The bidder shall defend, indemnify, and save harmless the County and its officers and agents from all claims, demands, payments, suits, actions, recoveries and judgments of every description, whether or not well founded in law, brought or recovered against it, by reason of any act or omission of said bidder(s) their agents, subcontractors or employees, in the execution of the contract, or for the use of any patented inventions by said bidder, and a sum sufficient to cover aforesaid claims may be retained by the County from monies due to become due to the bidder under contract, until such claims shall have been discharged.
11. ROYALTIES AND LICENSE FEES: The bidder shall pay all royalties and license fees. The bidder herein agrees to assume and save the County, its officers, and agents harmless from liability of any kind or nature whatsoever, arising out of the use by the County, its officers and agents of any appliance, apparatus, or mechanism, which may be furnished or installed by the bidder under the terms of this contract including patent or copyright infringement and to defend the County from any and all such liabilities whether or not such claims are well founded in law.
12. ASSIGNMENT OF CONTRACT: The bidder who is awarded a contract shall not assign, transfer, convey, sublet or otherwise dispose of said contract, or right, title or interest in or to the same, or part thereof, without previous consent in writing from the Board of County Commissioners, endorsed on or attached to the contract.
13. CANCELLATIONS: Should the material supplied or delivered to the County under this contract fail at any time to meet the specifications required by the contract, then in such event, the County may cancel this contract upon written notice to the bidder.

14. CONTROL OF WORK: The Clerk of Courts, Maureen Kelly, will decide all questions which may arise as to the quality and acceptability of materials, furnished; work performed as to the rate of progress of the work; all questions which may arise as to the interpretation of the plans and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor; and to compensation.
15. CLAIMS FOR ADJUSTMENT AND DISPUTES: If, in any case, the Contractor deems that additional compensation is due for work or materials not clearly covered in the contract or not ordered by the County Commissioners as extra work, as defined herein, the Contractor shall notify the County Commissioners and the Lake County Clerk of Courts in writing of their intention to make a claim for such additional compensation before they begin the work on which the claim is based. If such notification is not given and the County Commissioners are not afforded proper facilities by the contract for keeping strict account of actual costs required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor, and the fact that the County Commissioners have kept an account of the cost aforesaid, shall not in any way be construed as proving or substantiating the validity of the claim. If the claim, after consideration by the County Commissioners is found to be just, it will be paid as extra work in the amount as approved by the County Commissioners.
16. DURATION OF CONTRACT: A contract shall be for the period stated in the specifications, and shall include all materials, equipment, and/or services ordered or delivered during the period. All prices quoted shall be for a definite fixed price unless otherwise noted in the specifications.
17. PURCHASES: After a contract has been signed, it shall only become operative upon delivery to the bidder, of a duly signed purchase order. The County shall only be obligated under the contract to the extent of such order. The County shall not be liable for any claims in the event that the total quantity of material ordered under the contract should prove to be greater or less than the estimated amount in the specifications.
18. DELIVERIES: The bidder agrees to make deliveries of supplies and materials within a reasonable period from the time purchase orders are received, which reasonable time is estimated to be thirty (30) days, unless otherwise stated in bid.
19. PAYMENT OF INVOICES: Invoices will be due and payable within thirty (30) days of receipt of the invoice by the County. All invoices should be mailed to the attention of the Clerk of Courts at 25 North Park Place, Painesville, OH 44077. Payments may be made on the basis of the schedule of values.

20. GENERAL: Contractors shall furnish all labor, equipment, materials, services and supplies necessary to complete the proposed work. All work shall be performed according to all standards of good workmanship complete in every detail. Contractors shall coordinate their work with the work of others and upon completion, remove tools, equipment, waste and debris and leave the site in broom clean condition. Contractors shall warrant all materials and equipment with the normal and usual warranties, including, where applicable, warranties of merchantability and fitness for a particular purpose.

The County of Lake reserves the right to accept any part of any bids and reject all or parts of any and all bids, and waive any informalities in bidding.

21. PREVAILING WAGE: Contractors must comply with ORC Chapter 4115 when applicable. It is the contractor's responsibility to contact the County's Prevailing Wage Coordinator, Erin Fink, 440-350-2770 to determine requirements. Wage rates can be viewed at the Ohio Department of Commerce website.

**III**

**CORPORATE RESOLUTION**

\_\_\_\_\_, Secretary of \_\_\_\_\_  
(Name) (Company Name)

an \_\_\_\_\_ Corporation hereby certifies that the following is a true  
(State)

and correct copy of a resolution duly adopted by the Board of \_\_\_\_\_  
(Company Name)

\_\_\_\_\_, on \_\_\_\_\_, 20\_\_ to wit:  
(Date)

“Resolved, that the \_\_\_\_\_ of this company,  
namely, \_\_\_\_\_, be and he hereby authorized and  
directed to enter into any and all contracts, bid guaranty and performance bonds with  
THE COUNTY OF LAKE, OHIO, for the purpose of furnishing labor and materials as to

\_\_\_\_\_ at such price and upon such terms and conditions, including any amendments or  
modifications thereto, as said \_\_\_\_\_  
(Name)

in his sole discretion shall deem best, and that said actions shall be binding upon  
Corporation. Resolved further, that said \_\_\_\_\_ be, and  
(Name)

he further is authorized and directed to execute and deliver unto said COUNTY OF  
LAKE, OHIO other instruments which in his discretion he shall deem necessary to carry  
out the foregoing resolution.”

FEDERAL TAX ID NUMBER: \_\_\_\_\_

CORPORATE SEAL: (Place seal here)

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of  
said Corporation of \_\_\_\_\_, \_\_\_\_\_

This \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, and I further certify that said  
resolution is still in full force and effect.

**IV**

**SIGNATURE PAGE**

BIDDER NAME (print/type): \_\_\_\_\_

BIDDER ADDRESS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

STATE INCORPORATED: \_\_\_\_\_ DATE: \_\_\_\_\_

Per page CR-1, Corporate Resolution, I \_\_\_\_\_  
(Signature)

Secretary of \_\_\_\_\_ certify that this is a true and correct copy of the Corporate Resolution on file as of this date.

Per Page 1, Proposal-Contract Form, the undersigned having been authorized to enter into Bids/Contracts on behalf of the Corporation hereby submits this proposal for consideration.

\_\_\_\_\_  
(Name – print/type)

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

\_\_\_\_\_  
(Signature)

V.

**PROPOSAL CONTRACT FORM**

TO: BOARD OF LAKE COUNTY COMMISSIONERS  
105 MAIN STREET  
LAKE COUNTY ADMINISTRATION  
PAINESVILLE, OH 44077

The undersigned has read and understood all the information contained in the Contract Documents and General Notes including all Addenda, and accepts the same as sufficient to indicate and convey understanding of all conditions and requirements under the Contract, and proposes to comply with all the conditions and requirements of these documents.

I/WE \_\_\_\_\_  
DO HEREBY SUBMIT THE FOLLOWING BID PROPOSAL BASED ON  
SPECIFICATIONS ATTACHED HERETO, ON THE FOLLOWING:  
\_\_\_\_\_  
Lake County Clerk of Courts, Title Central

**TOTAL GROSS BID \$** \_\_\_\_\_  
**NUMBER OF CALENDAR DAYS TO COMPLETE CONSTRUCTION** \_\_\_\_\_  
**CONTRACTOR WARRANTY:** Workmanship – 2 years, Materials – 1 year

I/WE DO HEREBY SUBMIT A CERTIFIED CHECK, CASHIER'S CHECK, OR  
LETTER OF CREDIT IN THE AMOUNT OF \$ \_\_\_\_\_  
REPRESENTING **TEN PERCENT (10%)** OF THE TOTAL AMOUNT OF THE BID,  
OR A **BID BOND** IN THE **FULL AMOUNT** OF, AS REQUIRED BY OHIO  
REVISED CODE 153.54

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
TELEPHONE (\_\_\_\_) \_\_\_\_\_  
CONTACT PERSON \_\_\_\_\_  
BY AND THE TITLE \_\_\_\_\_  
(Signature and title)

This form may be duplicated when there are several items that make up the bid. This page must be used because it contains **TOTAL** bid price and the **10% (TEN PERCENT) OF BID** or **FULL AMOUNT OF BID BOND**. It also requests the warranty & delivery information.

The additional pages should follow this page. Those will be the pages from the bid spec listing all the individual items that make up the bid and their cost. (Example: labor-material or furniture for example will consist of chairs, desks, tables, panels, etc., this obviously will require additional pages cost breakdown by units).



## VI

### SUPPLEMENTARY CONDITIONS

#### 1. BID FORM

Contractors submitting a bid are to use the Bid Form provided. It is to be filled out completely. Incomplete forms will not be considered. The Bid must include the following information:

- A. BASE BID -- Total cost to complete the scope of work as called for in the drawings and specifications. See drawings and specification for specific work to be performed.
- B. ALTERNATE ITEMS -- Items noted as alternates are to be listed on the Bid Form as an add or deduct in accordance with drawings and specifications.
- C. TIME TO COMPLETE CONSTRUCTION -- Amount of time, in regular calendar days, from the date the contractor is authorized to begin work shall be submitted in conjunction with the Bid Form.
- D. SUBSTITUTIONS - List any substitutions the contractor proposes to use that deviate from products specified in the drawings, or that are noted.

Short list contractors selected may be required to submit a complete list of any proposed subcontractors that Contractors plan to use. This can include multiple names of trades when it has not been determined which sub will provide work. Final selection of sub trades shall be from list provided. Any sub trade substitutions should be presented to the Owner's Representative for approval.

#### 2. ADDENDUM

Should any error or inconsistency appear in the drawings, or if any person contemplating the submission of a bid for the proposed work is in doubt as to the true meaning of any part of the Drawings, Specifications or other Contract Documents, the Bidder shall contact the Architect. Any interpretation to the Contract Documents will be made by written Addendum only, and shall be issued to each of the contractors bidding the work.

#### 3. DRAWINGS AND SPECIFICATIONS

Plans, specifications, and bidding forms may be picked up at the Lake County Board of Commissioners, 105 Main Street, 4<sup>th</sup> Floor, Painesville, OH 44077.

- A. The contractor awarded the project can purchase additional drawings as required
- B. Each bidder must fully acquaint themselves with "all" documents so as to fully understand and consider the entire scope of work.

Each bidder must visit the site to familiarize himself completely with existing conditions, and to verify all utility connections, local laws and codes, etc., prior to submitting a bid. No consideration will be given to claims of items missing on a bid.

#### **4. SCHEDULE OF VALUES**

- A. Immediately following award of the contract and prior to the first application for payment, each Contractor shall submit to the Architect a schedule of values for all portions of the work.
- B. The schedule shall be an itemized breakdown of values allocated to both materials and labor for every phase of the work and if multiple scopes of work are awarded they shall individually listed under each section and/or primary portion of each section of the building construction on standard AIA documents and format.
- C. This breakdown and schedule of values will be used as a basis for partial payments to the Contractor. It is therefore essential that the breakdown be as representative of the true total cost of each item as is possible to ascertain. The Owner shall have the right to require the Contractor to submit copies of other subcontractor agreements or documentation regarding breakdown costs necessary to confirm the accuracy of the schedule of values.
- D. Prevailing Wage will be required. See Prevailing Wage information provided in these specs.

#### **5. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

- A. Each Contractor is cautioned that he is responsible for checking and coordinating all shop drawings, pertaining to his Contract for compliance with documents, dimensions, fit and for coordination with various trades. Shop drawings submitted shall bear Contractor's written endorsement signifying that he has checked them for fit and conformity to the specifications. Drawings which are incomplete or inadequate will not be accepted.
- B. Shop Drawings may be submitted electronically to the office of the Architect. Samples shall be submitted as requested in the specifications and drawings within 21 calendar days after each contract is awarded. Submit copies of items in the form requested, showing illustrated cuts, dimensions, performance characteristics, and all pertinent information. One electronic copy of checked submissions will be returned to the Contractor.
- C. Architect's review of shop drawings is only for conformance with design concept and compliance with information given in the Contract Documents. In the event of variance between anything

shown on the shop drawings and the drawings or specifications, the drawings shall control. A shop drawing is not a Contract Document and no review thereof shall operate to modify any Contract Document. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction; and for coordinating work of all trades. Second and subsequent submissions will be checked for previously noted corrections only.

- D. All required samples shall be submitted to the Architect's office at a sufficiently early date to permit thorough review and approval. Samples shall be generous and a true representation of the material selected or to be selected as to color and dimensions.
- E. Shop drawings not requested in the specifications on the drawings, or in the Scopes of work will not be reviewed.

## VII

### SPECIFICATIONS

#### 1. GENERAL REQUIREMENTS

- A. INTENT: The intent of these specifications is to describe: Only bids submitted for the complete products will be considered. The County reserves the right at the time of the bid award to accept or reject any or all bids.
- B. BRAND OR TRADE NAME: Brand names, where mentioned in these specifications, are not intended to be restrictive, but rather to indicate the level of quality required by the County. In any instance where a brand name is mentioned, it is assumed that the phrase "or equal" shall follow.
- C. MANUALS: One (1) complete set of parts, repair manuals or O&M manuals shall be provided with and for each different model/project at the time of delivery.
- D. WARRANTY: Bidder shall submit written conditions and periods of warranty with the bid proposal.
- E. OSHA: Bidder shall comply with the provisions of the Occupational Safety and Health Act and Standards and Regulations issued thereunder and certify that all items conform to and comply with said standards and regulations.
- F. PREVAILING RATES OF WAGES: Attention is called to the prevailing rates of wages to be paid labor on public improvements as ascertained by the State of Ohio Department of Industrial Relations.

For current prevailing rates of wages, contact Erin Fink, Lake County Prevailing Wages Coordinator at 440-350-2770 or visit the Ohio Department of Commerce website.

#### 2. MINIMUM REQUIREMENTS:

- A. These specifications detail minimum requirements acceptable to the County of Lake. Should the manufacturer's current specifications exceeds these, they shall be considered minimum and shall be furnished, and equipment and components included in the bid shall be stipulated. Any additions, deletions, or variations from the minimum must be stated in the space provided with the specifications.

- B. Any and all parts not specifically mentioned in these specifications but which are required for the proper and safe operation of the products shall be furnished by the bidder and shall conform in strength, quality of material and workmanship to that provided by the industry in general. All items not specifically mentioned but which are standard factory items shall be furnished.

**1. DESCRIPTION**

- A. General: This Section covers a brief general description of the work to be accomplished under this Contract. It is not intended to cover all items required to complete this project.
- B. Application:
  - 1. Instructions to Bidders, General and Supplementary Conditions and Division 1 General Requirements shall be applicable to every division and section of these specifications and are binding upon all Subcontractors and suppliers.
  - 2. Drawings and Specifications are directed to each General Contractor and his Subcontractors and the inclusion of any work by mention, note, detail or itemization, however brief, means that they shall provide and install same, unless specifically directed otherwise.

**2. INSURANCE TO BE PURCHASED BY ALL CONTRACTORS**

Before starting work, Contractor shall obtain insurance from acceptable companies covering the following items. Certificates of insurance shall be available and shall contain an agreement that such policy or policies, will not be cancelled without 30 days advance notice of such cancellation being given to the Owner.

- A. Statutory Workmen's Compensation: Coverage shall comply with statutory provisions of the State in which the Contractor performs said work with a minimum of at least \$1,000,000 per occurrence. Before any Subcontractor is permitted to begin work on the premises, the Contractor shall obtain Certificates of Insurance from the Subcontractor covering Workmen's Compensation Insurance.
- B. Comprehensive Automobile Liability: This shall be written on the comprehensive form policy; Basic policy form is not acceptable. Policy shall provide coverage for owned automobiles, hired automobiles and non-owned automobiles including Class 1 and Class 2 employees, and shall contain minimum amounts of liability as follows:
  - \$ 1,000,000- Each occurrence, bodily injury
  - \$ 1,000,000- Each occurrence, property damage

C. Comprehensive General Liability:

1. This shall be written on the comprehensive form policy including completed operations; basic policy form is not acceptable. Policy shall contain minimum amounts of liability as follows:

Bodily Injury Liability

\$ 1,000,000- Each occurrence

*Property Damage Liability* (Products and completed operations to be maintained for one year after final completion)

\$ 1,000,000- Each occurrence

2. The insurance policies must include the Indemnification (Hold Harmless) as called for in the AIA General Conditions, and name Lake County and its representatives as additional insured and the following shall be typed on all certificates:
  - a. Contractors shall protect, indemnify and save the County and the Architect/Engineer, their agents and employees harmless from and against any and all claims, demands, actions, causes of action, suits, judgments, liability, and expenses (including attorney's fees) arising or growing out of any act, failure to act, or negligence on the part of the Contractor, his Sub-Contractors or employees growing out of or connected with the project.
  - b. Lake County and the Architect's office shall receive 30 days notice of cancellation prior to any of the above policies being cancelled.

**1. DESCRIPTION**

- A. Temporary facilities shall be provided by the General Contractor.
  - 1. Temporary utilities such as heat, water, lighting, electricity, and telephone.
  - 2. Field office (for general contractor's use only)
  - 3. Sanitary facilities
  - 4. Enclosures such as tarpaulins, barricades, and canopies.
  - 5. Construction fencing
  - 6. Project Sign
- B. Related work described elsewhere:
  - 1. All equipment furnished by contractors shall comply with all requirements of pertinent safety regulations including, the ladders, planks, hoists, and similar items normally furnished by the individual trades in execution of their own portions for the work.
  - 2. Permanent installation and alteration of the various utility lines are described in other Sections of the Specifications.
- C. Job Conditions: Make all required connections to existing utility systems with minimum disruption to services to the surrounding areas. When disruption of the existing services is required, do not proceed without Owner's approval through the General Contractor and, when required, provide alternate temporary service.

**2. FIELD OFFICE**

The General Contractor must maintain a field office in the existing building on site located where acceptable to the Owner. Copies of permits, approved shop drawings, and a complete set of Contract Drawings and Specifications, marked up to date with any revisions, shall be kept at said office ready for use at all times.

All other contractors wishing to have a field office or trailer must get specific permission from the General Contractor and agree on the location prior to setting up.

All field offices must be cleaned, painted, and made ready to be occupied by future county offices upon completion of the project.

### **3. PROTECTION OF EXISTING FACILITY**

- A. The building property is part of an operating retail complex. Every effort must be made to not disrupt existing operation of business as little as possible. All workers must abide by park rules.
- B. All contractors parking and their employees, deliveries, etc. shall take place in an approved parking area.

### **4. PRODUCTS**

- A. Utilities General: All temporary facilities shall be provided by the General Contractor.
- B. Water will be available from existing facilities. Temporary hook-ups to bring water to construction area will be provided by the General Contractor.
- C. Electricity will be available on the site and the Electrical Contractor will furnish all electricity needed for construction by means of temporary power connections, and shall be removed when completed. Temporary lighting in work areas must be provided by the Electrical Contractor in such a manner that 20 foot-candles of light is maintained in all construction areas.
- D. Heating: General Contractor shall provide temporary heating system if required and cost of fuel consumed for proper conduct of all operations included in the work. HVAC Contractor shall make permanent units available for temporary use.
- E. Sanitary facilities: A temporary sanitary facilities (portable toilet) for use by all personnel shall be provided by the General Contractor at the site. Maintain in a sanitary condition at all times.
- F. Enclosures: Each Contractor shall furnish, install, and maintain for the duration of construction all required scaffolds, tarpaulins, barricades, canopies, warning signs, steps, bridges, platforms, and other temporary construction necessary for proper completion of the work in compliance with all safety and other regulations.
- G. Fencing of Construction Area: As required for safety and security in accordance with all O.S.H.A., local ordinances, will be provided by the General Contractor.
- H. Project Signs: No exterior project signs will be permitted. Interior window signs only as permitted by the County. No signs or advertising of any kind on the job site except as specifically approved in advance by the Owner.

**5. EXECUTION**

- A. Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the work. Remove all such temporary facilities and controls as rapidly as progress of the work will permit, or as directed by the General Contractor.

**1. DESCRIPTION**

- A. Work included: This Section covers procedures to be followed for preparing the Project for acceptance by the Owner and final payment.
- B. The General Contractor shall prepare and file a "Notice of Commencement" with the appropriate authority upon beginning construction.

**2. CLEANING**

- A. During Construction: Each Contractor must oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish. During progress of work, clean-up site and building areas and dispose of waste materials, rubbish, and debris. A general trash dumpster shall be maintained by the General Contractor on the site for miscellaneous trash. Each contractor is responsible for providing waste containers for packaging or demolition involved in their scope of work. Provide waste containers and locate on site for collection of waste materials, rubbish, and debris. Do not allow waste materials, rubbish, and debris to accumulate and become an unsightly or a hazardous condition on the site. If it becomes necessary for the Owner to have areas cleaned properly the cost shall be passed on to the General Contractor.
- B. Final Cleaning shall be provided by the General Contractor: Use experienced workman or professional cleaners for final cleaning. At completion of construction and just prior to acceptance or occupancy, conduct a final inspection of exposed interior and exterior surfaces. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from interior and exterior surfaces. Repair, patch, and touch-up marred surfaces to match adjacent finishes. Clean heating and ventilating equipment and ducts if equipment was in operation during construction operations.

**3. PUNCH LIST**

- A. Each contractor shall not call for the "Punch List" inspection until he has conducted his own inspection and corrected all deficiencies in readiness for acceptance as substantial completion.
- B. Each contractor shall present their completed scope of work to the General Contractor and address any items they find necessary.

- C. The Owner's representative and Architect shall look at the Project, or portion of Project, with the Contractor and shall record all items that are unacceptable on a "Punch List". All equipment shall be tested during this inspection.
- D. If the Project is substantially complete, in the opinion of the Owner's representative, the General Contractor shall prepare a Letter of Certification of Substantial Completion. The "Punch List" shall be a part of the Certificate.

#### **4. FINAL INSPECTION**

- A. After receipt of Certification Letter, the General Contractor shall remedy every item thereon, and upon completion of remedial work, he shall notify the Owner's representative that the Project, or portion of the Project, is ready for final inspection.
- B. Upon notification from the General Contractor, the Owner's representative with the contractor, shall make a full inspection of all items contained in the "Punch List".

#### **5. ACCEPTANCE OF THE PROJECT**

- A. If all items listed have been corrected to the satisfaction of the Owner, he shall notify the General Contractor of his acceptance of the Project, or portion of the Project.
- B. After acceptance by the Owner, the General Contractor shall deliver a complete set of redlined "As Built" drawings, all guarantees, bonds, warranties, maintenance and operating manuals, valve charts, certificates, inspection reports, etc., as required by the Contract Documents.
- C. The above information (other than As Built Drawings) shall be collected by the General Contractor and shall be presented to the Owner in a three ring binder format.

#### **6. CERTIFICATE OF OCCUPANCY**

- A. The General Contractor contractor shall obtain a Certificate of Occupancy as required by governing township (County) authorities and give the Owner prior to final acceptance of Project work.

#### **7. RELATED DOCUMENTS**

- A. Items which each contractor shall be delivered to the Owner at the close of the project include, but are not limited to, the following:

1. RELEASE or WAIVER of LIENS: ( as specified by the State of Ohio for the "Notice of Commencement".) From all contractors performing work on the project
2. GUARANTEES: All guarantees in excess of one year stipulated under the various technical sections as specified herein, or in Contract.
3. AS-BUILT DRAWINGS: as specified herein.
4. MAINTENANCE MANUALS: for operating equipment specified under the mechanical, electrical, and other sections, as specified.
5. COMPLETED PUNCH LIST - as specified.

## **8. AS-BUILT DRAWINGS**

- A. As-built record drawings shall be a full set of Contract Drawings, provided by each of the Contractor and collected and assembled by the General Contractor for Owner's use showing the following:
  1. The location of underground mechanical and electrical services, utilities and appurtenances, referenced to permanent surface improvements.
  2. The location of internal mechanical and electrical services, utilities and appurtenances concealed in buildings and structures, referenced to visible and accessible features of the building or structure.
  3. Significant deviations made during construction.
  4. Significant details not previously shown on drawings, including site and building.
  5. As Built Drawings shall consist of a clean set not used in the field during construction.

## **9. MAINTENANCE MANUALS**

- A. Before issuance of Certificate of Substantial Completion, Contractor shall submit maintenance manuals to the Owner as follows:
  1. Each subcontractor shall, under the direction of the General Contractor, furnish 3 complete sets of manuals, containing the manufacturer's instructions for maintenance and operation of each item of equipment and apparatus

furnished under the Contract and any additional data specifically required under each Technical Section of the Specifications. The manuals shall be arranged in proper order, indexed and suitable bound.

2. Maintenance manuals shall include:
  - a. Shop drawings as finally approved
  - b. Description of materials and methods for lubrication;
  - c. Wiring and control diagrams;
  - d. Start-up, operation and shut-down instructions;
  - e. Servicing and cleaning instructions;
  - f. Preventive maintenance and repair procedures;
  - g. Parts lists and source.
  - h. Name, address, telephone, email information on installers.

## **10. CERTIFICATE OF FINAL COMPLETION**

- A. Upon completion to the satisfaction of the owner's representative, all items above, and the completion of the punch list, then a Certificate of Final Completion can be obtained by the General Contractor. The one year contractor's warranty will begin on the date of this certificate.

**1. DESCRIPTION**

A. General

1. Work includes, but is not limited to:
  - a. Throughout the construction period, each contractor shall maintain the building, and site in a standard of cleanliness as described in this Section.
2. Related Work Specified Elsewhere
  - a. In addition to standards described in this Section, comply with all requirements for cleaning up as described in various other Sections of these Specifications.
3. Quality Assurance
  - a. Codes and standards
  - b. In addition to the standards described in this Section comply with all pertinent requirements of governmental agencies having jurisdiction.

**2. PRODUCT**

A. Cleaning Materials and Equipment

1. Each contractor shall Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

B. Compatibility

1. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, and recommended by the manufacturer of the material or as approved by the General Contractor.

**3. EXECUTION**

A. Progress Cleaning:

1. Each Contractor shall retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.

2. Do not allow the accumulation of scrap, debris, waste material, and other items, not required for construction of this work.
3. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.
4. Maintain site area impacted by other contractors performing NIC work.

B. Site:

1. As necessary, each contractor shall inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. Maintain the site in a neat and orderly condition at all times.

C. Buildings:

1. As necessary, each contractor shall inspect the structures and pick up all scrap, debris and waste material. Remove all such items to a place designated for their storage.
2. As necessary, sweep all interior spaces clean. "Clean," shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and hand held broom.
3. As required preparatory to installation of succeeding materials, clean the structure of pertinent portions to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, clean the finish floor while work is being performed in the space in which finish materials have been installed. "Clean," for the purpose of this Sub paragraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Owner may be injurious to the finish floor material.

D. Final Cleaning shall be performed by the General Contractor.

**1. DESCRIPTION**

- A. This section specifies administrative and procedural requirements for cutting and patching.
- B. Cutting and Patching Required: Approval for proceeding with cutting and patching is required prior to beginning work. Submit a proposal to the General Contractor describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include dates, time needed to complete work, and any interruption in utilities, as applicable, in the proposal.
- C. Cutting and Patching shall be the responsibility of each Contractor

**2. PRODUCTS**

- A. When patching use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect as approved by the Architect. Use materials whose installed performance will equal or surpass that of existing materials.

**3. EXECUTION**

- A. Inspection: Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
  - 1. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
  - 2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- B. Performance
  - 1. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures

with the original installer; comply with original installer's recommendations.

2. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
3. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
4. Cut through concrete and masonry using a cutting machine such as a Carborundum Saw or Diamond Core Drill.
5. If any back filling is required it must be done with approval of material and method by the projects soil engineer
6. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

#### C. Cleaning

Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

**DIVISION 5 METALS**  
**LIGHT GAUGE STEEL FRAMING**

**Section 0540**

**1. DESCRIPTION**

- A. Work included: The extent of the light gauge steel framing is shown on the Drawings. It includes the installation of wall studs and runner tracks, complete with clips, bridging, stiffeners, etc., as required for a complete framing package.
- B. Quality Assurance: Comply with standards of the A.I.S.I. specifications and as specified on drawings and herein.
- C. Submittals: Manufacturer's recommended methods of installation.

**2. PRODUCTS**

- A. Design specifications based on use of products manufactured by the USG Company or comparable by "National Gypsum."
  - 1. Metal Wall Studs:  
Sizes: 3 5/8" @ 16" o.c.  
Gauge: Hot-dipped galvanized steel, 20 Gauge Minimum, steel studs, studs to be sized by the manufacture to meet minimum requirements for size, height, and wind pressure of the area they are used
  - 2. Accessories: Manufactured runner, tracks, bracing

**3. EXECUTION**

- A. Erection: Erect the work of this Section in strict accordance with the manufacturer's recommendation.
- B. Fabrication General: Shop fabricated items shall be new materials of sizes detailed. Include clips, bolts, screws, and other fastenings necessary to secure work. Accurately make tightly fit joints. Coordinate with work of other Sections. Provide punchings and drillings indicated or required for attachment of other work.
- C. Welding: Weld joints in accordance with AWS standards. On surfaces exposed to view, grind welds to smooth, flush surface. Remove flux and weld spatter and grind off sharp projections of welds not in finished surfaces of miscellaneous items.
- D. Galvanizing: Miscellaneous metal items to be galvanized shall comply with ASTM A525. Galvanizing or zinc coating on fabricated items shall comply with ASTM A386. Shearing, punching, welding and drilling shall be completed to extent practical before

galvanizing begins. Clean field welds in shop galvanized surfaces and repair with touch-up material.

E. Shop Painting:

1. Shop Primer: Ferrous metal, except galvanized surface, shall be properly cleaned and given one shop coat of primer material in accordance with manufacturer's recommendations. Apply two (2) coats of primer to surfaces which will be inaccessible after assembly or erection.
2. Built-In Items: Coat anchors that are built into masonry with asphalt paint unless specified to be galvanized.
3. Touch-Up: After erection of fabricated items, marred surfaces of shop painting, erection marks, field welds, shall be painted as specified for shop painting. Clean surfaces of rust, oil, and dirt before applying touch-up paint.

F. Built-In Work: Provide bolts, anchors, inserts, and other miscellaneous metal items or fastenings for building into concrete or masonry. Coordinate such work to provide required number, type, and location of such items.

G. Miscellaneous Structural Items: Furnish all miscellaneous structural items such as channels, clip angles, bearing plates, supports for all miscellaneous items. Sizes, type, and extent of miscellaneous items shall be as indicated on Drawings.

H. Lintels, Shelf Angles, Plates: Provide miscellaneous lintels, shelf angles, clip angles, closure plates, bearing plates, anchors and other items as indicated and as necessary to complete structural work. Bearing length of lintels shall equal 1 inch per foot of opening and have 6 inches minimum bearing at each end, unless otherwise indicated. Weld or bolt members together where so indicated. Provide holes for attaching items to concrete or masonry with bolts or adjustable inserts where indicated. Where items are secured to masonry with anchors, steel anchors shall be of size indicated on Drawings and welded to backs of plates or angles, spaced as indicated.

I. Dissimilar Materials: Where dissimilar metals are in contact or where aluminum is in contact with concrete, mortar, masonry, or pressure treated wood, surfaces shall be protected with a coat of bituminous paint or other type of coating material to prevent galvanic or corrosive action.

**DIVISION 6 WOOD AND PLASTICS  
LUMBER AND MILLWORK**

**Section 0600**

**1. DESCRIPTION**

- A. Work included: Provide all woods, nails, bolts, screws, framing anchors and other rough hardware and all other items needed for rough and finish carpentry work.
- B. Quality assurance: Comply with all pertinent codes and regulations and manufacturer's recommendations.
- C. Product Handling: Use all means necessary to protect lumber materials before, during and after delivery to the job site and to protect the installed work and materials of all other trades.

**2. PRODUCTS**

- A. Framing Lumber Product Standard: Identify all framing lumber by the grade stamp and moisture content of the National Forest Products Association.

Studding, Blocking and Plates: Spruce, Pine or Fir, Grade No. 2, Kiln dried.

- B. Nails, Bolts and Connectors:  
All connections to be in accordance with OBBC Appendix A & Table 2304.9.1.

**3. EXECUTION**

- A. Workmanship: All rough carpentry shall produce joints true, tight and well nailed, with all members assembled in accordance with the drawings and all pertinent codes and regulations. Cooperate with all trades and provide all grounds blocking, wood backing and framing and perform all necessary cutting and patching of rough carpentry work as required.
- B. Stud Framing
  - 1. Framing per ANSI/AF&PA WFCM-2001 "Wood Frame Construction Manual" and National Lumber Association "Manual for House Framing."
- C. Fasteners Framing Connectors: Bolting and screw connections shall be pre-drilled and nailing shall meet the minimum requirements of "OBC Fastener Schedule for Structural Members", Table 2304.9.1

- D. Cleaning Up: Keep the premises in a neat, safe, and orderly condition at all times during the execution of this work, free from accumulation of sawdust, cut ends, and debris.

**1. DESCRIPTION**

- A. Work included: Fitting and installing all finish carpentry work needed for a complete and proper installation including but not necessarily limited to:
  - 1. Counter Tops
  - 2. Closets: Shelving and accessories
  - 3. Interior Trim Work
  
- B. Submittals
  - 1. Product Data: Submit product data for countertops.
  - 2. Shop Drawings: Submit shop drawings for countertops and pass thru countertops, indicating edge detail.
  - 3. Samples: Submit sample of plastic laminate and solid surfacing material for color selection.

**2. PRODUCTS**

Miscellaneous interior trim to be paint grade Poplar

- A. Cabinetry: See Section 1230
  
- B. Solid Surface Counter Tops: Shall be solid surface material as manufactured by Corian, Wilson Art, Nevmar. Provide rounded edge selected by Architect.
  - 1. Solid surface material will be selected by Architect.

**3. EXECUTION**

- A. Provide blocking in walls prior to the gyp. Board for mounting trim, cleats, and supports
  
- B. All building should be complete and finished product. Any miscellaneous trim, hardware, etc. Required for a finished product must be included.

**DIVISION 7 THERMAL AND MOISTURE PROTECTION      Section 0721**  
**BUILDING INSULATION**

**1. GENERAL**

- A. Work included: Provide building insulation required for this work including, but not limited to:
  - 1. Exterior Surfaces
  - 2. Sound Walls
- B. Product Handling:
  - 1. Protection: Use all means necessary to protect the material of this Section before, during and after installation and to protect the work and materials of all other trades.

**2. PRODUCTS**

- A. BATT insulation material shall be the product of Owens/Corning, or Manville Building Products, or other approved the Architect.
  - 1. Sound Walls: 3 1/2" Unfaced friction fit fiberglass sound attenuating batts

**3. EXECUTION**

- A. Installation: Install the work of this Section in strict accordance with the manufacturer's printed instructions for the specific product.
  - 1. Insulation shall be installed to fit all framing spaces, behind electrical outlets, piping and other areas, to form a continuous insulation blanket around the structure.
  - 2. Doors/Windows: All cracks around doors and windows shall be sprayed with foam insulation. Stuff small odd shaped cavities with insulation and tape vapor barrier over these areas.
  - 3. Insulation shall not be installed over or within three inches of light fixtures, fans or other heat generating electrical devices, unless the fixture is approved for the purpose, and complies with NFPA Electrical Code.
- B. Verification: Upon completion of the installation in each area, visually inspect and verify that all insulation is complete and properly installed.

**1. DESCRIPTION**

- A. Work included: Throughout the Work, caulk and seal all joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of air and passage of moisture.
- B. Manufacturer's recommended for use and methods of installation.

**2. PRODUCTS**

- A. Butyl lap sealer: For metal lap joints.
- B. Painter's caulk compound: For exterior and interior use.
- C. Color: Standard colors normally available from the specified manufacturers.
- D. Primers: Non-staining

**3. EXECUTION**

- A. Caulking and sealants: All caulking and sealant materials joint preparation, conditions, depth, backup rod application, surface protection and guarantees for the selection of proper exterior and interior joints shall be in accordance with current published recommendations of the manufacturer.

**DIVISION 8 DOORS AND WINDOWS  
METAL DOORS AND FRAMES**

**Section 0810**

**1. DESCRIPTION**

- A. Work included: Provide all metal doors and frames complete in place where shown on the Drawings, and as specified herein.
  - 1. Related work:  
Finish Hardware - Provide hardware to perform function described in door schedule. Hardware supplier to have a qualified DH architectural hardware consultant meet with the Clerk of Courts Representative and Architect to review door schedule and create a hardware schedule and keying schedule.
- B. Quality Assurance: comply with steel door institute Recommended Specifications: standard steel doors and frames" (SDI-100) and standards specified herein.
- C. Submittals:
  - 1. Shop Drawings: Shop drawings shall indicate elevations and details of each frame type, location in building for each item, conditions at openings with various wall thickness and materials, typical and special details of construction, methods of assembling sections, location and installation requirements for hardware, size, shape and thickness of materials, joints and connections.

**2. PRODUCTS:**

- A. Interior Hollow Metal Doors
  - 1. Provide 18 gauge, 1 ¾ inch thick doors, Extra Heavy Duty, Level 3, Model 1 full flush, interlocking edgeseam.
  - 2. Doors shall be factory primed for field finish paint work of Division 9.
- B. Interior Hollow Metal Frames
  - 1. Provide 16 gauge frames, Level 3
  - 2. Knock – Down frames are acceptable
  - 3. Frames shall be factory primed for field painting, work of Division 9.

- C. Manufacturers:
  - Amweld Building Products
  - Ceco Door Products
  - Curries
  - Steelcraft
  - Other approved by Architect
- D. Primer: Factory baked-on coat of rust inhibitive primer suitable as a base for specified finish paints, field finished as work of Division 9.
- E. Finish hardware preparation: Prepare doors and frames to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with final finish hardware schedule. All doors are to be prepared for finish hardware prior to being shipped to the site.

### **3. EXECUTION**

- A. Installation: Install the work of this Section in strict accordance with the manufacturer's recommendation.
- B. Shop Primer: Interior frames shall be bonderized prior to applying shop coat. Exterior primes shall be shop primed and asphaltic coated on the inside of exterior frames.
- C. Shop Painting: Clean and chemically treat metal surfaces to assure maximum paint adherence. Follow with a dip or spray coat of rust-inhibitive metallic oxide, zinc chromate, or synthetic resin primer on all surfaces. Finished surfaces shall be smooth and free from irregularities and rough spots. Primer shall be baked or oven dried. Time and temperature for drying shall be in accordance with manufacturer's recommendation for developing maximum hardness and resistance to abrasion.
- D. Hardware Preparation: Reinforcement: Concealed reinforcement members, gauges of metal in accordance with manufacturer's recommendations for type of hardware and size of door to be hung in frame provided gauges used are not lighter than those required by ANSI A115.
- E. General: Factory prepare frames for installation of hardware. Welding of hinges to frames will not be permitted. Frames shall be mortised, reinforced, drilled and tapped to hardware templates. Provide cover boxes in back of cut-outs for hardware. Door frames shall be factory punched to receive rubber door silencers, three per strike jamb.

**1. GENERAL**

- A. Work included: Doors meeting the description on plans, door schedules, and notes:
1. Extent and location of each type wood door is indicated on drawings and in schedules.
  2. Types of doors required include the following:
    - a. Solid core wood doors with oak veneer faces
  3. Factory-finishing of flush wood doors is included in this section.
  4. Metal door frames for wood doors are specified in another section.
- B. SUBMITTALS:
1. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, typical and special details of construction conditions at opening including wall thickness & materials, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
  2. Samples of prefinished oak veneer for selection.
- C. QUALITY ASSURANCE:
1. Quality Standards: Comply with the following standards:  
NWWDA Quality: I.S.1 "Industry Standard for Wood Flush Doors", of National Wood Window and Door Association (NWWDA).
  2. Contractor shall verify and coordinate frame thickness for all wall conditions prior to ordering.
  3. Manufacturer: Obtain doors from a single manufacturer.
- D. PRODUCT DELIVERY, STORAGE AND HANDLING:
1. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install,

and Maintain Wood Doors", as well as with manufacturer's instructions.

2. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

E. PROJECT CONDITIONS:

1. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location:

F. WARRANTY:

1. General: Warranties shall be in addition to and not a limitation of, other rights the Owner may have under the Contract Documents.
2. Door Manufacturer's Warranty shall include repairing or replacing defective doors that have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.
3. Warranty shall also include reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
4. Warranty shall be in effect during following period of time after date of Substantial Completion: life of installation
5. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

## 2. PRODUCTS

A. MANUFACTURERS:

1. Manufacturers: Subject to compliance with requirements, manufacturers offering doors which may be incorporated in the work include the following:
  - a. Algoma Hardwoods, Inc.
  - b. Buell Door Company

- c. Eggers Industries, Architectural Door Division
- d. Marshfield
- e. Others approved by Architect

B. INTERIOR WOOD DOORS:

- 1. Solid Core Doors for Transparent Finish: Comply with the following requirements:
  - a. Faces: Prefinished Oak Veneer
  - b. Construction: 5-Ply, commercial Grade

C. FACTORY FINISHING:

- 1. General: Comply with referenced AWI quality standard including Section 1500, "Factory Finishing", custom Grade.
- 2. Prefinish wood doors at factory, stain color as selected by Architect.
- 3. Provide AWI Catalyzed Polyurethane finish system.

**3. EXECUTION**

A. EXAMINATION: Examine installed door frames prior to hanging door:

- 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
- 2. Verify that frames match actual wall thickness.
- 3. Reject doors with defects

B. INSTALLATION:

- 1. Hardware: For installation see Division 8 "Finish Hardware" section of these specifications.
- 2. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions.
- 3. Prefit Doors: Fit to frames for uniform clearance at each edge.
- 4. Factory Finished Doors: Restore finish before installation, if fitting or machining is required at the job site.

C. ADJUSTING AND PROTECTION:

1. Operation: Rehang or replace doors which do not swing or operate freely.
2. Finished Doors: Refinish or replace doors damaged during installation.
3. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

**1. DESCRIPTION**

- A. Work included: Provide all gypsum drywall and accessories complete in place as shown on the drawings, and as needed for a complete and proper installation.
- B. Quality Assurance: Comply with standards specified in ASTM C 840 and with gypsum board manufacturer's recommendations.

**2. PRODUCTS**

- A. Design is based on use of products manufactured by the United States Gypsum Company and as an indication of the quality and style required. Products of other manufacturers may be acceptable as demonstrated to be equal.
- B. Gypsum wallboard: Thickness of gypsum board to be 5/8" with tapered edges unless otherwise noted.
- C. Trim Accessories: Dur-A-Bead corner beads, corner beads and trims to be metal, and as recommended by manufacturer and in accordance with ASTM C 475.
- D. Fasteners: Gypsum panels to steel framing: Type S bugle head screws in accordance with ASTM C 1002.
- E. Joint compounds/reinforcing tapes
  - 1. Interior: Ready Mix Joint Compound.
  - 2. Reinforcing tape: Perf-A-Tape.
  - 3. Waterproof insulating tape for metal door/window framing.

**3. EXECUTION**

- A. Installation: All gypsum board to be glued and screwed to studs and in strict accordance with the manufacturer's recommendations.
- B. Minimum Room Temperatures: For adhesive attachment and finishing of gypsum board maintain not less than 50 degrees F for 48 hours prior to application and continuously there after until drying is complete.

- C. Where hollow metal frames are located in metal stud walls provide spot grouting at all hollow metal frame anchors in accordance with ASTM C 475.

**1. DESCRIPTION**

**A. DESCRIPTION OF WORK:**

1. Definition: Tile includes ceramic surfacing units made from clay or other ceramic materials.
2. Extent of tile work is indicated on drawings and schedules.
3. Walk-Off Mat

**B. QUALITY ASSURANCE:**

1. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
2. Static Coefficient of Friction: Comply with ASTM C 1028.

**C. SUBMITTALS:**

1. Submit Samples for Architect's approval: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.
2. Samples for Selection Purposes: Submit the following:
  - a. Samples for each type and color, and texture of tile available, not less than 8" square.
  - b. Samples of grout color.

**D. DELIVERY, STORAGE AND HANDLING:**

1. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

**E. PROJECT CONDITIONS:**

1. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.

2. Vent temporary heaters if required to exterior to prevent damage to tile work from carbon dioxide buildup.
3. Maintain temperatures at not less than 50 deg. F (10 deg. C) in tiled areas during installation and for (7) days after completion, unless higher temperatures are required by referenced installation standard or manufacturer's instructions.

## **2. PRODUCTS**

### **A. DESIGN BASIS:**

1. 12" x 12" nonslip porcelain tile with ANSI duty rating #3 min. & 5/16" thick min. Tile to meet all ADA requirements. All materials & installation to follow manufacturer's guidelines and the Tile Council of America, inc. (TCA). Provide all required trim shapes, such as cove base, bullnose, etc. Floor tiles to be cut on site if trim shapes not available. Tile to be set in thin-set Portland Cement mortar according to manufacturer's strict instructions with crack isolation membrane. 1/4" min. cement board under mortar when going over wood substrate. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide 3/16" grout joints. Install and space expansion and control joints in all directions in accordance with the Tile Council of America detail #EJ-171.
2. Foyer, Vestibule & Restroom Tile: "Vitrestone select glazed floor", 12" x 12" x 5/16", price group 2, as manufactured by Dal Tile. Colors will be selected by Architect.
3. Base: Cove Base, to member with floor tile; colors selected by Architect.

### **B. ACCEPTABLE MANUFACTURERS:**

1. Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, the following
  - a. American Olean Tile Co., Inc.
  - b. U.S. Ceramic Tile.
  - c. DAL Tile
  - d. Florida Tile

C. PRODUCTS, GENERAL

1. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types and grades of tile indicated.
2. Colors, Textures and Patterns: For tile, grout and other products requiring selection of colors, surface textures or other appearance characteristics, provide products and materials complying with requirements specified.
3. Grout and Setting Materials: Provide product recommended by Tile Manufacturer for substrates indicated. Architect will select grout colors.
4. Elastomeric Sealants: Provide manufacturers standard Urethane Pourable Sealant for Traffic (type T); ASTM C920 and as approved by Construction Manager.

D. Walk-Off Mat: "3M Nomad Scraper matting 9100" as manufactured by 3M. Color will be selected by Architect. Refer to drawings for size and location.

**3. EXECUTION:**

A. EXAMINATION:

1. Examine surfaces to receive tile work and conditions under which tile will be installed. Do not proceed with tile work until surfaces and conditions comply with requirements indicated in referenced tile installation standard.

B. INSTALLATION, GENERAL:

1. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile".
2. Jointing Pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles of floor, base, walls and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.

C. CLEANING AND PROTECTION:

1. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
2. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
3. Prohibit foot and wheel traffic from using tiled floors for at least (7) days after grouting is completed.
4. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

**DIVISION 9 FINISHES**  
**SUSPENDED ACOUSTIC TILE CEILING**

**Section 0950**

**1. DESCRIPTION**

- A. Work included: Acoustical ceiling system and accessories shall be complete in place as shown on the reflected ceiling plans drawings, specified herein, and needed for a complete and proper installation.
- B. Quality Assurance: Comply with standards specified under class "A" tile and specified herein.
- C. Submittals: Samples of each style acoustical tile and suspension system for approval by Architect/Owner.

**2. PRODUCTS**

- A. Design and specifications based on use of products manufactured by Armstrong World Industries and catalog numbers of that manufacturer are given as an indication of the quality and style required. Products of other manufacturer's only if approved by the Architect.
  - 1. Acoustic Tile Ceiling: "Cortega Second Look II " as manufactured by Armstrong, color selected by Architect.
  - 2. Ceiling System/Accessories: "Supra Fine 9/16-inch narrow grid" as manufactured by Armstrong; color selected by Architect

**3. EXECUTION**

- A. Installation: Install the work of this Section in strict accordance with the manufacturer's recommendation.
- B. Install suspension systems to comply with ASTM C 636, with hangers supported only from building's structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel, and edge moldings screwed to substrate at no more than 16" O.C.
- C. Leveling of ceilings: Provide leveling to a tolerance of 1/8" in 12'-0".

**1. DESCRIPTION**

- A. Work included: Paint all exterior and interior exposed surfaces and all areas, items and components as specified herein and indicated on drawings.
- B. Quality Assurance: All paints, cleaners, etc. should be supplied by the same manufacturer to ensure compatibility and to comply with standards specified herein.
- C. Submittals: Color chart selection of items proposed to be painted for approval by the Architect.

**2. PRODUCTS**

- A. All paint products used to be as manufactured by Benjamin Moore, ICI, or Sherwin Williams, and used in compliance with manufacturer's recommendations.
- B. Colors will be selected by Architect

**3. EXECUTION**

- A. Application of paints, stains, or other coating systems shall be in strict accordance with manufacturer's directions. Ready-mixed paint shall not be thinned, except as permitted in the application instructions.
- B. Exterior painting shall be done only in favorable weather. All surfaces shall be free of dew or frost and shall be free of moisture.
- C. Paint shall not be applied when the temperature is at or expected to be below 40 degrees F.
- D. All surfaces to be finished shall be clean and free of foreign materials (dirt, grease, asphalt, rust, etc.)
- E. Application shall be in a workmanship manner providing an even film. Application rate shall be that recommended by the manufacturer.
- F. Apply not less than the number of coats required for the specific application. Additional coats may be required if the finish surface does not provide acceptable coverage or hiding, whether specified that way or not.

- G. Materials and equipment not to be painted: Non-ferrous metals, finish hardware, or moving parts of mechanical and electrical equipment.
- H. Painting work shall be complete and cover all items usually painted or finished.
- I. Schedules
  - 1. Exterior Wood-Painted (Opaque):
    - a. One coat of alkyd primer sealer
    - b. Two coats of alkyd enamel, semigloss
  - 2. Exterior Steel – Shop Primed:
    - a. Touch-up with alkyd primer
    - b. Two coats of alkyd enamel, semigloss
  - 3. Exterior Steel – Galvanized:
    - a. One coat of galvanized primer
    - b. Two coats of alkyd enamel, semigloss
  - 4. Interior Wood-Painted
    - a. One coat of alkyd primer sealer
    - b. Two coats of alkyd enamel, semigloss
  - 5. Interior Wood – Transparent:
    - a. Filler coat (for open grained wood only)
    - b. Two coats of stain
    - c. One coat of polyurethane sealer
  - 6. Interior Plaster, Gypsum Board:
    - a. One coat of alkyd primer sealer
    - b. One coat of latex enamel, flat or eggshell;
  - 7. Concealed Interior Steel-Unprimed:
    - a. One coat of alkyd primer
  - 8. Exposed Interior Steel – Primed:
    - a. Touch-up with original primer
    - b. Two coats of alkyd enamel, semigloss
  - 9. Interior Concrete, Concrete Block:
    - a. One coat of block primer alkyd primer sealer
    - b. Two coats of alkyd, semigloss
  - 10. Exterior Fiberglass and Synthetic Wood
    - a. One coat acrylic primer
    - b. Two coats acrylic, semi-gloss

**1. DESCRIPTION**

A. Description of Work:

1. Layout of toilet partitions is indicated on drawings
2. Types of toilet compartments include: Metal -- baked enamel finish.
3. Styles of toilet compartments include: Floor – anchored and overhead braced
4. Styles of screens include: Wall-hung.
5. Toilet accessories, such as toilet paper holders, grab bars, purse shelves, are specified elsewhere in Division 10.

B. Submittals:

1. Shop Drawings: Submit shop drawings for fabrication and erection of toilet partition assemblies not fully described by product drawings, for approval by the Architect.
2. Samples: Submit full range of standard color samples for each type of unit required for Selection by Architect.

C. Quality Assurance:

1. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to ensure proper fitting of work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay work.
2. Coordination: Furnish inserts and anchorages which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

**2. PRODUCTS:**

A. Manufacturers:

1. Manufacturer: Subject to compliance with requirements, provide products of one of the following:  
American Sanitary Partition Corp.

Global Steel Products Corp.  
Monarch Toilet Partition, Inc.  
Sanymetal Products Co.

B. Materials

1. Steel Sheets for Baked Enamel Finish: ASTM A 591, Class C, galvanized bonderized, of following minimum thickness:  
Pilasters (unbraced): 16 gauge  
Panels and Screens: 20 gauge  
Doors: 22 gauge
2. Concealed Anchorage Reinforcement: Minimum 12-gauge galvanized steel sheet.
3. Hardware and Accessories: Manufacturer's standard exposed fasteners of stainless steel, chromium plated steel, with theft-resistant type heads and nuts. For concealed anchors, use hot-dip galvanized, cadmium plated, or other rust resistant protective coated steel.

C. Fabrication:

1. General: Furnish standard doors, panels, screens, and pilasters fabricated for partition system, unless otherwise required.. Furnish units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

D. Finishes:

1. Baked enamel finish:
2. Color: One of manufacturer's standard colors in each room, as selected by Architect.

**3. EXECUTION**

A. Installation:

1. General: Comply with manufacturer's recommended procedures and installation sequence. Install partitions rigid, straight, plumb, and level. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls. Secure panels to walls with not less than two stirrup brackets attached near top and bottom of panel. Secure panels to pilasters with not less than two stirrup brackets located to align with stirrup

brackets at wall. Secure panels in position with manufacturer's recommended anchoring devices.

2. Floor Supported Overhead Braced Partitions: Set pilaster units with anchorages having not less than 2" penetration into structural floor, unless otherwise recommended by partition manufacturer. Level, plumb, and tighten installation with devices furnished. Hang doors and adjust so that tops of doors are level with tops of pilasters when doors are in closed position.
3. Screens: Attach with concealed anchoring devices, as recommended by manufacturer to suit supporting structure. Set units to provide support and to resist lateral impact.

B. Adjust and Clean

1. Hardware Adjustment: Adjust and lubricate hardware for proper operation. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors (and entrance swing doors) to return to fully closed position.
2. Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

**DIVISION 10 SPECIALTIES  
TOILET ROOM ACCESSORIES**

**Section 1090**

**1. DESCRIPTION**

A. Description of Work:

1. Types of toilet accessories required include the following:
  - Paper towel dispenser
  - Combination towel dispenser/waste receptacle unit
  - Soap Dispenser
  - Grab bars
  - Toilet Tissue dispenser (2 Roll Unit)
  - Sanitary napkin disposal unit
  - Mop and broom holder
  - Baby Changing Station

B. Quality Assurance:

1. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.
2. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

C. Submittals: Product data for all accessories

1. Samples: Submit Manufacturer's literature photos to Architect for approval by Architect

**2. PRODUCTS**

A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering toilet accessories which may be incorporated in the work include the following:

1. American Specialties, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation
4. Hallmack-Nutone/Div. Scovill
5. Miami-Carey

B. Design Basis: Bradley Washroom Equipment Div.

1. Provide stainless steel, #4 finish for accessories

C. All accessories to be recessed where possible

**3. EXECUTION:**

- A. Locations of fixtures to be verified by Architect during construction. Blocking to provided where required prior to installing gypsum board.
- B. All fixture to be mounted in strict accordance with all ADAAG requirements.

**1. DESCRIPTION**

- A. Section Includes:
  - 1. Break Room Cabinets
  - 2. Public Counter and Cabinets
  - 3. Scanning Station Counter
  - 4. Plastic-laminate countertops and backsplashes
  - 5. Solid Surface Countertops and backsplashes
  - 6. Cabinet Hardware
  
- B. Submittals
  - 1. Product Data: For the following:
    - a. Cabinets
    - b. Cabinet Hardware
    - c. Plastic-Laminate
    - d. Solid Surface Countertops
  
  - 2. Shop Drawings: For cabinets and countertops. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles.
  
  - 3. Samples, Manufacturer's standard options:
    - a. Plastic Laminates, materials available.
    - b. Solid Surface, materials available.
  
- C. Quality Assurance
  - 1. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

**2. PRODUCTS**

- A. Cabinets
  - 1. Quality Standard: Provide cabinets that comply with KCMA A161.1.
  
  - 2. Face Style: Flush overlay.
  
  - 3. Cabinet Style: Frameless for Plastic Laminate Cabinets.
  
  - 4. Door and Drawer Fronts: 3/4" thick, frameless with PVC edge banding and 3/4" thick solid wood center panels. All

exposed surfaces to be high pressure plastic laminate on particleboard. Shelves to be 1/32" min. thick material.

B. Cabinet Materials

1. Adhesives and Composite Wood and Agrifiber Products: Do not use products that contain urea formaldehyde.
2. Adhesives: Use adhesives that comply with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
3. Composite Wood and Agrifiber Products: Provide products that comply with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
4. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde.
5. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
6. Hardboard: ANSI A135.4, Class 1 Tempered.

C. Cabinet Hardware

1. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.
2. Pulls: Surface-mounted decorative pulls.
3. Hinges: Concealed European-style self-closing hinges.
4. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or B05091.

D. Countertop Materials

1. Solid Surface: 100% Acrylic patterned materials, full one-half inch (1/2") thickness, with rounded edge and undermount sinks.

2. Adhesives: Do not use adhesives that contain urea formaldehyde.

### **3. EXECUTION**

#### **A. INSTALLATION**

1. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
2. Install cabinets without distortion so doors and drawers fit openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.
3. Install cabinets and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
4. Fasten cabinets to adjacent units and to backing.
  - a. For wood studs/ blocking: Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
  - b. For metal studs/ blocking: Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches o.c., with toggle bolts through metal backing behind gypsum board.
5. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

## SECTION 15010 - MECHANICAL GENERAL PROVISIONS

### PART 1 GENERAL

#### 1.1 GENERAL

- A. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates, Addenda and Division 1 are part of this Specification. A requirement occurring in one is as binding as though occurring in all. They are intended to be complimentary and to describe and provide for complete project.
- B. Provide work specified but not indicated or indicated but not specified, as though mentioned in both. Examine Mechanical, Architectural, Structural, Electrical, and all other Drawings, as well as other Divisions of the Specifications for items, which affect Work under this Division.

#### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Finish Painting: Division 9.
- B. Electric Power Wiring: Electrical Division 16.

#### 1.3 QUALITY ASSURANCE

- A. Codes, Permits, and Fees:
  - 1. Comply with rules, regulations of State of Ohio, Lake County, City of Mentor, and authorities having jurisdiction over the premises, including safety requirements of OSHA.
  - 2. Secure and pay for permits and inspections required. Make payments to public utilities for work performed by them in providing service connections.
  - 3. Turn over certificates of approval, by governing agencies, to Architect/Engineer.
- B. Underground Work and Below Floor:
  - 1. Locations of underground or below floor utilities are indicated in an approximate way only. Determine location of existing utilities and structure before commencing work. Be responsible for damages which might be occasioned by failure to locate and preserve underground utilities.
- C. Standards:
  - 1. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
  - 2. Conform to reference standards by date of issue current as of date of Contract Documents.
  - 3. When specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

#### 1.4 SCOPE OF WORK

- A. Examine carefully site of proposed Work, the Bid Form, Drawings, Specifications and contract forms. No additional payment will be made on claims that arise from lack of knowledge of existing conditions. Become familiar with character, quality, and quantities of work to be performed, materials to be provided, and as to requirements of the Drawings, Specifications, General Requirements, and Contract Requirements. Submission of a bid shall be prima-facie evidence that Bidder has made such an examination.
- B. Provide necessary materials, labor, superintendence, tools, appliances, and equipment, and execute in a workmanlike manner the Work of this Contract within the time and in the manner specified, and in conformity with requirements set forth herein and in accordance with the Contract Documents.
- C. It is the intent of the Specifications and Drawings for mechanical work that each part will be complete as related to other parts, and there will be no omission from any portion of the system or systems, even though each and every minor item may not be specifically mentioned in the Specifications nor indicated on the Drawings. The systems shall be complete with all necessary accessories for proper operation.
- D. Provide work, products, and materials specifically required by State, Federal, and/or Local codes or regulations, but not included in the Drawings and Specifications.

#### 1.5 GENERAL DEFINITIONS

- A. Wherever the words herein defined are used in this Specification or on the Drawings, they shall have the meaning as defined in the General Conditions, Supplementary Conditions, and General Requirements.
- B. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.
- C. Where the word "Provide" appears, it shall be interpreted to mean the Contractor shall furnish all labor, materials, equipment, and supplies necessary to install and place in operating condition.
- D. Equal, Similar, and Equivalent: Means same quantity, size, number, value, degree, intensity and items are similar in all respects. Final decision of acceptance of these items will be made by Architect/Engineer. It is understood that, for items on Drawings and in the Specifications, this term shall apply.
- E. Utilities: Includes, but not limited to, water mains, sanitary and storm sewers, electrical distribution system, telephone distribution system, and lawn sprinkler system.

## 1.6 SUBMITTALS

- A. Record Drawings:
  - 1. Refer to Division 1.
  - 2. Each Contractor responsible for Division 15 Work shall keep one complete set of Contract Documents on the project site. Record deviations or changes from such Contract Drawings made during construction. Indicate changes in:
    - a. Size, type, capacity, and model number, of products, materials, device or piece of equipment.
    - b. Location of device or piece of equipment.
    - c. Location of outlet or source in building service system.
    - d. Routing of piping, ducts, sewers or other building services.
    - e. Valves in piping systems.
  - 3. Record location of concealed water piping, sewers, wastes, vents, ducts and other piping by indication of measured dimensions to each such line from readily identifiable and accessible walls or corners of building. Also indicate invert elevation of sewers and top of water lines.
  - 4. Keep Drawings clean and undamaged and do not use for any purpose other than recording deviations from Contract Documents and locations of concealed work.
  - 5. After project completion, deliver Drawings to Architect/Engineer in good condition, as permanent record of installation as actually constructed.
  - 6. In addition to record drawings, record changes and deviations on Coordination Drawings.
  - 7. At completion of project, submit corrected and updated Coordination Drawings to Architect/Engineer (for transmittal to the Owner) to become part of record drawings. When required, include virus-free AutoCAD discs of project and one set of mylar plots.

## 1.7 COORDINATION AND SUPERVISION

- A. Examine work of other trades, which comes in contact with or is covered by work of this Division. Do not attach to, cover, or finish against any defective work, or install work of this Division in a manner, which will prevent other trades from properly installing their work.
- B. Before installing work, report any interferences between work of this Division and work of other Divisions to Architect/Engineer as soon as discovered. Architect/Engineer will determine which work must be relocated or make adjustments to maintain clearance, maximum headroom, and to avoid conflict with other work. When work is installed so architectural design cannot be adhered to, be liable for cost of making such changes as Architect/Engineer may require.
- C. Cooperate and coordinate with other trades to avoid interferences and delays.

## 1.8 COORDINATION DRAWINGS

- A. Description of Work:
1. HVAC trade is assigned responsibility for preparation of Coordination Drawings.
  2. Be responsible for coordinating Work with other trades.
  3. Basis of Coordination Drawings will be sheet metal fabrication drawings with input as necessary from other Trades who have a necessity to coordinate their work with others.
  4. Prepare Coordination Drawings at a scale of not less than 1/4 inch equals 1 foot.
  5. Coordination Drawings to indicate relationship of all items of HVAC equipment, ductwork, HVAC piping, plumbing equipment, plumbing piping, and Electrical System.
    - a. Indicate items of electrical systems which affect location of HVAC equipment and plumbing equipment, HVAC piping, plumbing piping, ductwork, and air outlets.
    - b. Use these drawings to accurately designate locations of access doors, hangers, and support devices vital to the successful installation of items without conflict.
    - c. Be responsible for costs of relocation of items of work due to failure of prior coordination, and failure to provide correct information, or information in a timely manner.
    - d. No extra compensation will be made due to lack of coordination.
- B. Provide preparer of Coordination Drawings with necessary and sufficient information as required and as requested to permit development of the Coordination Drawings.
1. Information includes, but is not limited to, the following:
    - a. Framing and suspension details for ceilings, HVAC, sprinkler, plumbing, and electrical items.
    - b. Plumbing piping.
    - c. Location and site of electrical pull boxes, conduits 1-1/2 inches and larger, bus ducts, cable trays, and lighting fixtures and fixture hangers.
  2. After completion of Coordination Drawings, preparer issues copies to all other trade contractors concerned and obtains their final agreement. Each trade contractor signifies agreement and acceptance of Coordination Drawings by signing and dating each Drawing.
  3. After approval, furnish copies of "approved" Coordination Drawings to other trade contractors and Architect/Engineer.
  4. Generate Coordination Drawings from computer CAD program with minimum of AutoCAD 2014 in drawing format.
  5. Coordination Drawings are for Architect/Engineer's, Owner's, and trade contractor's use and are not be construed as replacing any shop drawings.

## 1.9 PROVISION FOR LATER INSTALLATION

- A. When mechanical work cannot be installed concurrent with building construction, provide sleeves, inserts, and other items as necessary for installation at a later date. Be responsible for location of chases and other openings through construction.
- B. Become acquainted with nature of construction against which this work attaches. Review structural drawings for coordination of openings. Cut no structural members or slabs without Architect/Engineer's written instructions.

## 1.10 PROTECTION

- A. When setting up pipe shop, cutting, threading machines, protect area against staining, abrasion.
- B. Protect surfaces from construction activity including chips, cutting oil, welding, cutting spatters, paint droppings, insulation adhesive, and duct sealant.
- C. Be responsible for costs involved in cleaning adjacent areas.

## 1.11 PRODUCT HANDLING

- A. Pay all costs for transportation of materials and equipment to project site.
- B. Provide scaffolding, tackle, hoists and rigging necessary for placing mechanical materials and equipment in proper place. Remove temporary work when no longer required.
- C. Arrange for packaging of equipment which must be hoisted so that there will be no damage or distortion caused by hoisting operation.
- D. Store materials, products, and equipment in a dry, clean location until building is ready to receive specified items. Protect materials, products, and equipment from dirt and moisture.

## 1.12 DAMAGE AND EMERGENCY REPAIRS

- A. Assume responsibility for damage caused by systems being installed. Repair damages without extra cost to Owner.
- B. Owner reserves right to make emergency repairs, without voiding Contractor's guarantee or relieving him of responsibility during the construction and warranty period.
- C. Restore roads, grounds, insulation, piping, building, fixtures, and equipment to their original condition whenever this work causes damage.

### 1.13 GUARANTEE AND WARRANTIES

- A. Refer to General Conditions, Supplementary Conditions, and Division 1.
- B. Warrant products, equipment, and Work is provided in accordance with good engineering practices and products and equipment will meet requirements specified. Replace products and equipment failing to perform or function as specified with complying products and equipment, without cost.
- C. Guarantee against defects in workmanship and materials; make good, repair or replace defective work, material or equipment within one year from date of acceptance.
- D. Guarantees on products will commence on the date of Substantial Completion, not from date products or equipment are put into operation.

### 1.14 EQUIPMENT OR SUBSTITUTIONS

- A. Refer to General Conditions, Supplementary Conditions, and Division 1.
- B. Specified products and substitution: Base bids upon specified product or listed alternative. Documents are based on products specified by type, model and size and thus establish minimum qualities, which substitutes must meet to qualify as acceptable. Proof of quality rests with the Bidder.
- C. Include required changes in foundation, building structure, electrical wiring, conduit, controls, piping, and ductwork when other than first named manufacturer is used. Be responsible for changes to scope or requirements of other Work necessitated by using equipment other than first named basis and design.
- D. Substitution may be offered for consideration under the following conditions:
  - 1. Proposed substitution is equal or superior to specified item in all respects. Indicate additional cost or credit. No later substitutes will be permitted.
  - 2. Extended delivery schedules on specified items, which would impact project schedule, will be cause for consideration of substitutions. Indicate proof of delay in delivery from manufacturer.
  - 3. Drawings and Specifications are based on requirements and layouts for products and equipment of first named manufacturer. Prepare new layouts of proposed substitution to be used for approval.

### 1.15 MATERIALS

- A. Unless noted otherwise, furnish new materials and of best quality with same brand of manufacturer used for each class of material or equipment.
- B. Provide incidental concrete, reinforcing steel, masonry, mortar, miscellaneous steel, painting, required to complete mechanical installations; perform in manner specified in applicable Division of General Trades Specifications.

## 1.16 INSTALLATION REQUIREMENTS

- A. Location of piping, equipment, ducts on Drawings is diagrammatic; follow indicated positions as closely as possible, exact locations are subject to building construction and interferences with other work. Where additional offsets in pipes or ducts are required to obtain head room or to avoid conflict with other work, provide same without extra charge. Take measurements and determine required elevations at project site.
- B. In general, conceal piping, equipment, and ducts. Architect/Engineer reserves the right to make minor changes in location of any part of the work up to the time of roughing-in without additional cost.
- C. Install materials, products, and equipment in neat and workmanlike manner by competent specialists for each sub-trade. Installation of materials, products, and equipment not meeting these standards will require removal and re-installation at no additional cost.
- D. Locate piping, equipment, and ducts to ensure maximum accessibility.
- E. Provide materials, equipment, and products in accordance with best engineering practice and in conformity with manufacturer's printed instructions. Provide complete auxiliary piping, water seals, valves, electric connections, and controls as recommended by manufacturer and required for proper operation.
- F. Perform cutting and patching in construction as necessary for this Work. Have cutting done by skilled mechanics as carefully as possible, and with as little damage as possible. Have patching done by first-class mechanics, skilled in the several trades.

## 1.17 PAINTING

- A. Finish Painting: Included under Division 9 - Finishes, except where specifically called for under this Division.
- B. Painting as indicated on the Drawings or as specified as part of the Mechanical Trades Work is included herein.
- C. Leave materials and equipment provided under this Division free from dirt, grease, and foreign matter, ready for painting.
- D. Do not paint equipment or piping before testing.
- E. Touch up damaged surfaces of factory finished materials and equipment to match existing finish.

## 1.18 PIPE, VALVE, AND EQUIPMENT IDENTIFICATION

- A. Refer to Section 15050.

## 1.19 OPERATING AND MAINTENANCE MANUAL

- A. Prepare 2 copies of Operating and Maintenance Manuals in large three-ring hard back binders for the following:
  - 1. Plumbing.
  - 2. HVAC.
- B. Assemble service manuals into one book. Bind written operating instructions, shop drawings, equipment catalog cuts, and manufacturer's instructions into a hard backed binder where they can be accommodated into 8-1/2 inch x 14 inch size. Organize material as follows:
  - 1. First Page: Title of Project, Owner, Address, Date of Submittal, Name of Architect, and Name of Engineer.
  - 2. Second Page: Table of Contents.
  - 3. First Section: Furnish copy of each Shop Drawing with table of contents at beginning of section.
  - 4. Second Section: Furnish copy of each manufacturer's operating instructions with table of contents at beginning of section. Indicate step-by-step procedure for start-up and shut down of each system. Include manufacturer's maintenance manuals.
  - 5. Third Section: Furnish copies of each control wiring diagram used in installation.
  - 6. Fourth Section: Furnish copies of tests, recordings, tabulations, and vendors' reports.
  - 7. Fifth Section: Furnish copies of warranties and guarantees.
  - 8. Sixth Section: Complete copy of valve chart indicating sizes; flanged, welded or soldered; manual or automatic; valve number and location.
  - 9. Seventh Section: Copies of Contractor's punch list, Architect/Engineer's punch list, and final inspection - complete when items on punch list are completed. Dated and signed receipt indicating keys have been turned over to proper authorities. Copies of certificates of equipment demonstrations and receipts indicating special tools and appurtenances have been turned over to proper authorities.
- C. Deliver to Architect/Engineer special tools and appurtenances for proper operation and maintenance of the equipment and products provided.

## 1.20 CLEANING

- A. Remove rubbish resulting from the Work from premises by trade producing it, as fast as it accumulates. At all times, keep premises in neat and orderly condition. Follow instruction of Architect/Engineer in regard to storing of materials, protective measures and disposing of debris.
- B. Upon completion of work, remove from project site tools, equipment, surplus materials and rubbish. Thoroughly clean piping, fixtures, and equipment.

- C. Cooperate with General Trades Contractor for cleaning. Refer to Division 1 for additional requirements.
- D. Replace temporary filters used during construction with type of filters specified in applicable Division 15 sections at Substantial Completion.
- E. Refer to individual Division 15 sections for cleaning of piping systems.

#### 1.21 LUBRICATION, PACKING, AND SUPPLIES

- A. Properly lubricate equipment before starting.
- B. Check each shaft containing a packing gland for condition by backing packing gland off and examine for proper grade, amount and type of packing as recommended by manufacturer.
- C. Maintain lubrication gaskets and packing during construction; assure that, at the time of substantial completion, all are in first-class condition.
- D. Install initial charge of refrigerant and any other supplies required to place equipment in operation.

#### 1.22 TESTS AND ADJUSTMENTS

- A. Refer to Section 15950 for testing, adjusting, and balancing requirements.
- B. Obtain inspections required by law, ordinances, rules, regulations of authorities having jurisdiction. Furnish certificates of such inspections. Pay fees and provide equipment, power and labor necessary for inspections and tests. Do not consider Work complete until required inspections have been obtained, tests performed, adjustments made, and satisfactory evidence of successful completion has been submitted.
- C. During testing period, maintain on project a foreman familiar with Project for as long as needed to thoroughly adjust systems and demonstrate they are functioning properly.
- D. Perform tests including, but not limited to, those specified in other Division 15 sections.
- E. Do not conceal or cover piping, fixtures, or equipment until they have been inspected and approved by authority having jurisdiction. Completely install and test Work as required by Contract Documents and ordinances. Repeat tests to satisfaction of those making inspection and Architect/Engineer.
- F. Repair damages resulting from tests or replace damaged materials at no cost and to satisfaction of Architect/Engineer.
- G. When damages are not promptly repaired, Architect/Engineer reserves right to remedy such damages and defects at Contractor's expense.

END OF SECTION

## SECTION 15050 - COMMON WORK RESULTS FOR PLUMBING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Piping materials and installation methods common to more than one section of Division 15.
  - 2. Pipe fittings.
  - 3. Pipe joining materials.
  - 4. Piping specialties.
  - 5. Valves common to more than one section of Division 15.
  - 6. Pipe hangers and piping supports.
  - 7. Mechanical sleeve seals.
  - 8. Pipe, valve, and equipment identification.

#### 1.2 SUBMITTALS

- A. Division 1: Submittal procedures.
- B. Product Data: Submit product data for the following:
  - 1. Escutcheons.
  - 2. Dielectric Unions and Fittings.
  - 3. Valves.
  - 4. Hangers and Supports: Submit manufacturer's technical product data, including MSS number for each type of hanger, support, and anchor.
  - 5. Mechanical Sleeve Seals.
  - 6. Pipe and Valve Identification.
- C. Welders' Certificate: Include welders' certification of compliance with ASME Section IX.

#### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- B. Perform Work in accordance with applicable authority for welding hanger and support attachments to building structure.

#### 1.4 DELIVERY, STORAGE, AND HANDLING:

- A. Provide temporary end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

- C. Protect flanges, fittings, and specialties from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.
- D. Ensure valves are dry and internally protected against rust and corrosion.
- E. Protect valve ends against damage to threads, flange faces, and weld-end preps.
- F. Store valves indoors. Maintain valve temperature higher than ambient dew point temperature. If outdoor storage is necessary, support valves off ground or pavement in watertight enclosures.
- G. Use sling to handle valve whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use hand wheels and stems as lifting or rigging points.

## PART 2 PRODUCTS

### 2.1 PIPE AND FITTINGS

- A. Pipe Specification 1:
  1. Pipe: ASTM B88, Type L, hard drawn copper tubing.
  2. Fittings: ASME B16.18, cast brass, or ASME B16.22, solder wrought copper.
  3. Joints: Solder, lead free, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F.
- B. Pipe Specification 3:
  1. Cast Iron Pipe: ASTM A74 service weight. Fittings: Cast iron. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.
  2. Cast Iron Pipe: CISPI 301, hubless. Fittings: Cast iron. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.
- C. Pipe Specification 4:
  1. Cast Iron Pipe: ASTM A74, service weight. Fittings: Cast iron. Joints: ASTM C564, neoprene gasket system or lead and oakum.
  2. Cast Iron Pipe: CISPI 301, hubless, service weight. Fittings: Cast iron. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

### 2.2 ESCUTCHEONS

- A. Chrome-plated, stamped steel, hinged, split-ring escutcheon, with set screw. Size inside diameter to closely fit pipe outside diameter, or outside of pipe insulation where pipe is insulated. Size outside diameter to completely cover opening in floors, walls, or ceilings.

## 2.3 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
  - 1. Ferrous Piping: Class 150, malleable iron, threaded.
  - 2. Copper Piping: Class 150, bronze unions with soldered or brazed joints.
  - 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- B. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions.
- C. Sleeves:
  - 1. Sleeves 5 inches and Smaller in Diameter: Schedule 40 galvanized, steel pipe, ASTM A53, Grade A.
  - 2. Sleeves 6 inches and Larger in Diameter: 10 gage, galvanized sheet metal, round tube closed with longitudinal joint.

## 2.4 VALVES

- A. Ball Valves:
  - 1. BA-1: 3 inches and smaller, 150 SWP, 600 WOG, two piece body, threaded ends, all bronze construction, teflon seats, chrome plated solid bronze ball, conventional port, blowout proof stem, lever handle with balancing stops. For insulated services, provide steel stem extension. Milwaukee BA-100 or similar by Nibco, Stockham, or Crane.
  - 2. BA-2: 3 inches and smaller, 150 SWP, 600 WOG, two piece body, soldered ends, all bronze construction, teflon seats, chrome plated solid bronze ball, conventional port, blowout proof stem, lever handle with balancing stops. For insulated services, provide steel stem extension. Milwaukee BA-150 or similar by Nibco, Stockham, or Crane.

## 2.5 JOINING MATERIALS

- A. Welding Procedures: Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- B. Brazing Materials: Comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials appropriate for materials being joined.
- C. Brazing Procedures: Perform Work in accordance with AWS 5.8 for brazing materials and procedures.
- D. Soldering Materials: Comply with procedures contained in AWS "Soldering Manual".

## 2.6 PIPE HANGERS AND SUPPORTS

- A. Conform to:
  - 1. ASME B31.9 (American Society of Mechanical Engineers) - Building Services Piping.
  - 2. MSS SP58 (Manufacturers Standardization Society of Valve and Fittings Industry) - Pipe Hangers and Supports - Materials, Design and Manufacture.
  - 3. MSS SP89 (Manufacturers Standardization Society of Valve and Fittings Industry) - Pipe Hangers and Supports - Fabrication and Installation Practices.
- B. Use only one type by one manufacturer for each piping service.
- C. Hanger Sizing: Select size of hangers and supports to exactly fit pipe size for bare piping, and to exactly fit around exterior of piping insulation with shield for insulated piping.
- D. Hanger Materials: Furnish copper plated hangers and supports for copper-piping systems. Furnish hangers and supports with galvanized finish for other piping systems.
- E. Hangers for Pipe Sizes 1/2 to 1-1/2 inch malleable iron, adjustable swivel, split ring.
- F. Hangers for Pipe Sizes 2 to 4 inches Carbon steel, adjustable, clevis.
- G. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- H. Vertical Support: Steel riser clamp.
- I. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
- J. Inserts: Malleable iron case or 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.

## 2.7 PIPE, VALVE, AND EQUIPMENT IDENTIFICATION

- A. Shutoff Valves, Balancing Valves, and Control Equipment:
  - 1. Mark by means of brass or plastic disc one inch in diameter fastened to valve wheel or stem by brass wire.
  - 2. Furnish each disc with legibly marked identification number.
  - 3. Furnish typewritten chart listing all valve tags, location, and function, place in glass frame, and hang where directed by Owner.

- B. Piping:
  - 1. Conform to ANSI A13.1. Use ANSI standard background colors and Style 2 for piping 3 inches and larger and Style 6 for piping smaller than 3 inch diameter. Attach markers to pipe by preformed "snap" type action for pipe 6 inches and smaller outside diameter (including insulation). For pipe 6 inches outside diameter and larger (including insulation), furnish preformed markers and fasten with straps.
  - 2. Provide identifying markings at intervals not exceeding 100 feet for straight runs of pipe; at every sectionalizing or main shut-off valve; and/or on each riser at point 5 feet above floor or platform. When passing through wall or partition, mark pipe on both sides of structure.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. The following are general piping installation requirements and apply to all systems specified in Division 22. For specific installation requirements refer to appropriate section.
- B. Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Location and arrangement of piping layout take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.
- C. Conceal pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

### 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.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

### 3.3 INSTALLATION - PIPING

- A. Route piping parallel to building structure and maintain gradient.
- B. Route piping parallel and perpendicular to walls.
- C. Install piping to conserve building space, and not interfere with use of space.
- D. Group piping whenever practical at common elevations.

- E. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain bottom of pipe level.
- 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.
- H. Support cast iron drainage piping at every joint.
- I. Fittings and Specialties:
  - 1. Use fittings for changes in direction and branch connections.
  - 2. Remake leaking joints using new materials.
  - 3. Size Reductions: Make reductions in pipe sizes using eccentric reducer fitting installed with level side up.
  - 4. Branch Connections Water Systems: Install branch connections to mains using Tee fittings in main with take-off out bottom or top of main. Install up-feed risers with branch at top of main.
- J. Pipe Joint Construction:
  - 1. Soldered Joints: Comply with procedures contained in AWS "Soldering Manual."
  - 2. Brazed Joints: Comply with procedures contained in AWS "Brazing Manual."
  - 3. Threaded Joints: Conform to ANSI B1.20.1, tapered pipe threads for field cut threads.
  - 4. Welded Joints: Comply with requirement in ASME Code B31.9-"Building Services Piping."

### 3.4 INSTALLATION - VALVES

- A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- B. Install valves with stems upright or horizontal, not inverted.
- C. Install unions adjacent to each valve, and at final connection to each piece of equipment and plumbing fixture having 2 inch and smaller connections.
- D. Install flanges in piping 2-1/2 inch and larger, where indicated, adjacent to each valve, and at final connection to each piece of equipment.
- E. Use 3/4 inch ball valves with hose end and cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

### 3.5 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install in accordance with ASME 31.9, MSS SP 58, and MSS SP 89.
- B. Support horizontal piping as scheduled.

- C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.
- E. Use hangers with 1-1/2 inch minimum vertical adjustment.
- F. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- G. Support vertical cast iron pipe at each floor at hub.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for uninsulated copper piping.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Provide clearance in hangers and from structure and other equipment for installation of insulation.
- L. Support piping running horizontally with, parallel to, horizontally through, or under bar joists from top chord of bar joists or beam.
- M. Loading of hanger or support to not exceed manufacturer's recommended maximum load.
- N. Do not support piping from other piping or ductwork.
- O. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.

### 3.6 INSTALLATION - SLEEVES

- A. Sleeve pipes passing through interior partitions, walls and floors.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves such that internal diameter is minimum of 2 inches larger than outside diameter of pipe for uninsulated pipe and 2 inches larger than insulation and jacket or vapor barrier for insulated pipe. Center pipe in sleeves.
- D. Install wall sleeves so sleeve is flush with both sides of wall.
- E. Piping exposed in occupied areas: Install floor sleeves so sleeve is flush with both sides of floor.
- F. Mechanical rooms: Install floor sleeves so sleeve is flush with ceiling side of floor and extends 2 inches above floor.
- G. Install chrome plated steel escutcheons at finished surfaces.

### 3.7 INSTALLATION - PIPE AND EQUIPMENT IDENTIFICATION

- A. Install identifying devices after completion of insulation and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Install tags using corrosion resistant chain. Number tags consecutively by location.
- E. Identify valves in main and branch piping with tags.
- F. Provide ceiling tacks to locate valves or above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

### 3.8 PIPE APPLICATION SCHEDULE

Piping Service	Pipe Specification Number	Remarks
Domestic Hot and Cold Water	1	
Sanitary sewer piping, above grade	4	Do not use PVC piping in return air plenums.
Sanitary sewer piping, buried within 5 feet of building	3	

### 3.9 VALVE APPLICATION SCHEDULE

Service	Valve Type			
	Shutoff	Throttling	Check	Strainer
Domestic cold-water	BA-1, BA-2, GA-1	BA-1, BA-2	CK-1	
Domestic hot water, hot water recirculation	BA-1, BA-2	BA-1, BA-2	CK-1	

MAXIMUM HORIZONTAL PIPE HANGER AND SUPPORT SPACING AND ROD DIAMETER FOR SINGLE RIGID ROD HANGERS

Nominal Pipe Size (inches)	Steel Pipe		Steel Pipe Grooved Ends Water Service feet (m)	Copper Pipe		Ductile Iron Pipe	Cast Iron Soil Pipe	Glass Pipe	Plastic Pipe	Minimum Rod Diameter Steel Piping inches (mm)	Minimum Rod Diameter Copper Piping inches (mm)
	Water Service feet (m)	Vapor Service feet (m)		Water Service feet (m)	Vapor Service feet (m)						
1/2	7 (2.1)	8 (2.4)	-----	5 (1.5)	6 (1.8)	Note 1.	Note 2.	Note 3.	Note 4.	3/8 (10)	3/8 (10)
3/4	7 (2.1)	9 (2.7)	-----	5 (1.5)	7 (2.1)					3/8 (10)	3/8 (10)
1	7 (2.1)	9 (2.7)	-----	6 (1.8)	8 (2.4)					3/8 (10)	3/8 (10)
1-1/4	7 (2.1)	9 (2.7)	-----	7 (2.1)	9 (2.7)					3/8 (10)	3/8 (10)
1-1/2	9 (2.7)	12 (3.7)	-----	8 (2.4)	10 (3)					3/8 (10)	3/8 (10)
2	10 (3)	13 (4)	-----	8 (2.4)	11 (3.4)					3/8 (10)	3/8 (10)
2-1/2	11 (3.4)	14 (4.3)	12 (3.7)	9 (2.7)	13 (4)					1/2 (13)	1/2 (13)
3	12 (3.7)	15 (4.6)	12 (3.7)	10 (3)	14 (4.3)					1/2 (13)	1/2 (13)
4	14 (4.3)	17 (5.2)	12 (3.7)	12 (3.7)	16 (4.9)					5/8 (16)	1/2 (13)
5	16 (4.9)	19 (5.8)	14 (4.3)	13 (4)	18 (5.5)					5/8 (16)	1/2 (13)
6	17 (5.2)	21 (6.4)	14 (4.3)	14 (4.3)	20 (6.1)					3/4 (22)	5/8 (16)
8	19 (5.8)	24 (7.3)	14 (4.3)	16 (4.9)	23 (7)					3/4 (22)	3/4 (22)
10	22 (6.1)	26 (7.9)	16 (4.9)	18 (5.5)	25 (7.6)					7/8 (25)	3/4 (22)
12	23 (7)	30 (9.1)	16 (4.9)	19 (5.8)	28 (8.5)	7/8 (25)	3/4 (22)				

Note 1: 20 feet maximum spacing, minimum of one hanger for each pipe section close to joint behind bell. Also provide hanger at each change of direction and each branch connection. For pipe sizes 6 inches and smaller, installed on ANSI B31 projects subjected to loadings other than weight of pipe and contents, limit span to maximum spacing for water service steel pipe.

Note 2: 10 feet maximum spacing, minimum of one hanger for each pipe section close to joint on the barrel. Also provide hanger at each change of direction and each branch connection.

Note 3: 8 feet maximum spacing, follow pipe manufacturer's recommendations for material and service conditions.

Note 4: Follow pipe manufacturer's recommendations for material and service conditions.

General Note: Spacing does not apply where span calculations are made or where there are concentrated loads between supports such as flanges, valves, specialties, or changes in direction requiring additional supports.

END OF SECTION

## SECTION 15250 - PLUMBING INSULATION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Piping insulation, jackets, and accessories.

#### 1.2 SUBMITTALS

- A. Division 1: Submittal procedures.
- B. Product Data: Submit product data and description, list of materials and thickness for each service, location, or equipment scheduled.

#### 1.3 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, or UL 723.
- B. Insulation shall not contain any PBDE (polybrominated diphenyl ethers) flame retardants.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material to site in original factory packaging, labeled with manufacturer's density and thickness.
- B. Store insulation in original wrapping and protect from weather and construction traffic.
- C. Protect insulation against dirt, water, chemical, and mechanical damage.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install insulation when ambient temperatures are less than 50 degrees F.
- B. Maintain ambient temperatures and conditions required by manufacturers of adhesive and insulation.
- C. Maintain temperature during and after installation of insulation for minimum period of 24 hours.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturers: Subject to compliance with requirements provide Mechanical Insulation products by one of the following:
  - 1. Armstrong.
  - 2. CertainTeed.
  - 3. Knauf.
  - 4. Owens-Corning.
  - 5. Armacell, LLC.
  - 6. Dow Plastics.

### 2.2 PIPE INSULATION

- A. TYPE P-1, Glass Fiber Insulation:
  - 1. ASTM C547; 'k' value of 0.24 at 75 degrees F; noncombustible; maximum service temperature of 300 degrees F.
  - 2. Vapor Barrier Jackets: Factory applied kraft reinforced foil vapor barrier with self-sealing adhesive joints.
- B. TYPE P-5, Cellular Foam: ASTM C534; flexible, closed cell elastomeric insulation, tubular; 'k' value of 0.27 at 75 degrees F. Temperature usage range: minus 58 degrees F to 180 degrees F.

### 2.3 PIPE INSULATION JACKETS

- A. PVC Jackets: One-piece, pre-molded type fitting covers, off-white color.
- B. Aluminum Jackets: ASTM B209; 0.020 inch thick with longitudinal slip joints and 2 inch laps, smooth finish; 0.016 inch thick die shaped fitting covers with factory attached protective liner.

### 2.4 PIPE INSULATION ACCESSORIES

- A. Piping 1-1/2 inches diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, type 40. Length: Based on pipe size and insulation thickness.
- B. Piping 2 inches diameter and larger: Wood insulation saddle, hard maple. Inserts length: not less than 6 inches long, of same thickness and contour as adjoining insulation.
- C. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
- D. Adhesives: Compatible with insulation.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Verify piping has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

### 3.2 INSTALLATION - PIPING SYSTEMS

- A. Install materials in accordance with manufacturer's instructions.
- B. Install pipe insulation continuous through walls, floors, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.
- C. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.
- D. Insulate entire system including fittings, valves, unions, flanges, strainers, and flexible connections.
- E. Piping 1-1/2 inches diameter and smaller: Install galvanized steel shield between pipe hanger and insulation.
- F. Neatly finish insulation at supports, protrusions, and interruptions.
- G. Glass Fiber Insulated Piping Systems: Insulate fittings, joints, and valves with insulation of like material and thickness as adjacent pipe, and finish with PVC fitting covers.
- H. Piping Exterior to Building: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjacent pipe. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

### 3.3 PIPING INSULATION SCHEDULE

Thicknesses are given in inches.

PIPING	TYPE	PIPE SIZE	THICKNESS
Domestic Hot Water Supply	P-1	1-1/4 inch and smaller	0.5
		1-1/2 inch and larger	1.0
Domestic Cold Water	P-1 or P-5	1-1/4 inch and smaller	0.5
		1-1/2 inch and larger	1.0

END OF SECTION

## SECTION 15251 - HVAC INSULATION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section includes:
  - 1. Ductwork insulation, jackets, and lining.

#### 1.2 SUBMITTALS

- A. Division 1: Submittal procedures.
- B. Product Data: Submit product data and description, list of materials and thickness for each service, location, or equipment scheduled.

#### 1.3 QUALITY ASSURANCE

- A. Materials: Flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, or UL 723.
- B. Insulation shall not contain any PBDE (polybrominated diphenyl ethers) flame retardants.
- C. Insulation "R" values shall be equal to or greater than required by code.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material to site in original factory packaging, labeled with manufacturer's density and thickness.
- B. Store insulation in original wrapping and protect from weather and construction traffic.
- C. Protect insulation against dirt, water, chemical, and mechanical damage.

#### 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install insulation when ambient temperatures are less than 50 degrees F.
- B. Maintain ambient temperatures and conditions required by manufacturers of adhesive and insulation.
- C. Maintain temperature during and after installation of insulation for minimum period of 24 hours.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturers: Subject to compliance with requirements provide Mechanical Insulation products by one of the following:
  - 1. Armstrong.
  - 2. CertainTeed.
  - 3. Knauf.
  - 4. Manville.
  - 5. Owens-Corning.
  - 6. Armacell, LLC.
  - 7. Dow Plastics.

### 2.2 DUCTWORK INSULATION

- A. TYPE D-1, Glass Fiber: ASTM C1290; flexible, commercial grade; 'k' value of 0.29 at 75 degrees F; 0.002 inch foil scrim facing.
- B. TYPE D-5, Glass Fiber (Duct Liner): ASTM C1071; flexible; 'k' value of 0.28 at 75 degrees F; 1.5 pound per cubic foot minimum density; coated air side for maximum 4,000 feet per minute air velocity.

### 2.3 DUCTWORK INSULATION JACKETS

- A. Aluminum Jackets: ASTM B209; 0.020 inch thick with longitudinal slip joints and 2 inch laps, smooth finish; 0.016 inch thick die shaped fitting covers with factory attached protective liner.

### 2.4 DUCTWORK INSULATION ACCESSORIES

- A. Adhesives: Waterproof fire-retardant type.
- B. Lagging Adhesive: Fire resistive to ASTM E84.
- C. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.
- D. Joint Tape: Glass fiber cloth, open mesh.
- E. Tie Wire: Annealed steel, 16 gage.
- F. Adhesives: Compatible with insulation.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Verify ductwork has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

### 3.2 INSTALLATION - DUCTWORK SYSTEMS

- A. Install materials in accordance with manufacturer's instructions.
- B. Install insulation continuous through walls, sleeves, hangers, and other duct penetrations.
- C. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- D. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- E. External Duct Insulation Application:
  - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
  - 2. Secure insulation without vapor barrier with staples, tape, or wires.
  - 3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
  - 4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
  - 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

### 3.3 DUCTWORK INSULATION SCHEDULE

DUCTWORK	TYPE	MINIMUM THICKNESS
Supply Ducts (externally insulated)	D-1	1.5
Return Ducts (externally insulated)	D-1	1.5
Round Supply Ducts (branch ducts to diffusers)	D-1	1.5

END OF SECTION

## SECTION 15410 - PLUMBING FIXTURES

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes: The following types of plumbing fixtures including trim, fittings, low voltage wiring, accessories, and supports. Types of fixtures specified include the following:
  - 1. Lavatories.
  - 2. Water Closets.
  - 3. Sinks
  - 4. Mop Receptors.
  - 5. Electric Water Coolers.

#### 1.2 SUBMITTALS

- A. Division 1: Submittal Procedures.
- B. Product Data: Submit product data for each fixture, faucet specialties, accessories, and trim specified. Indicate rated capacities of selected models of water coolers.

#### 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Store fixtures where environmental conditions are uniformly maintained within manufacturer's recommended temperatures to prevent damage.
- B. Store fixtures and trim in manufacturer's original shipping containers. Do not stack containers or store in such manner that may cause damage to fixture or trim.

### PART 2 PRODUCTS

#### 2.1 GENERAL

- A. Uniformity: Provide plumbing fixtures of one manufacturer as much as possible.
- B. Where Lavatories are noted to be insulated for ADA compliance, furnish the following: Safety Covers conforming to ANSI A177-1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white color, with weep hole and angle valve access covers. Manufacturer: Truebro "Handi Lav-Guard" kit, Model No. 102 or 105 (for offset traps).
- C. Sealant: For use between plumbing fixtures and wall: General Electric Sanitary Silicone 1702.

## 2.2 LAVATORY (L-1)

- A. Refer to Plumbing Fixture Schedule located on Drawing P-1.

## 2.3 WATER CLOSET (WC-1)

- A. Refer to Plumbing Fixture Schedule located on Drawing P-1.
- B. Mount flush valve with handle to wide side of stall.

## 2.4 SINK (S-1)

- A. Refer to Plumbing Fixture Schedule located on Drawing P-1.

## 2.5 MOP RECEPTOR (MR-1)

- A. Refer to Plumbing Fixture Schedule located on Drawing P-1.

## 2.6 ELECTRIC WATER COOLER (EWC-1)

- A. Refer to Plumbing Fixture Schedule located on Drawing P-1.

# PART 3 EXECUTION

## 3.1 PREPARATION

- A. Inspect each fixture for damage. Replace damaged fixtures.
- B. Verify dimensions by field measurements.
- C. Review millwork shop-drawings. Confirm location and size of fixtures and openings before rough in and installation.
- D. Examine rough-in for potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures.
- E. Examine walls, floors, and cabinets for acceptable conditions where fixtures are to be installed.
- F. Do not proceed until unsatisfactory conditions have been corrected.
- G. Confirm millwork is constructed with adequate provision for installation of counter top lavatories and sinks.

## 3.2 INSTALLATION

- A. Install plumbing fixtures level and plumb, in accordance with fixture manufacturer's written instructions, rough-in drawings, and pertinent codes and regulations.

- B. Comply with installation requirements of ANSI A117.1 and Public Law 90-480 with respect to plumbing fixtures for ADA use.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall carriers and bolts.
- E. Fasten plumbing fixtures securely to supports or building structure. Secure supplies behind or within wall construction to provide rigid installation.
- F. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture schedule for particular fixtures.
- G. Set and mop receptor in leveling bed of cement grout.
- H. Install stop valve in accessible location in water connection to each fixture.
- I. Install each fixture with trap, easily removable for servicing and cleaning.
- J. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork.
- K. Seal fixtures to walls and floors using silicone sealant as specified in this Section or in Division 07. Match sealant color to fixture color.
- L. Provide ASSE 1070 required point of use mixing valves at all public lavatories and sinks. Refer to Plumbing Fixture Schedule located on Drawing P-1 for point of use thermostatic mixing valve schedule.
- M. Test fixtures to demonstrate proper operation upon completion of installation and after units are water pressurized. Replace malfunctioning units, then retest.
- N. Clean fixtures and trim using manufacturer's recommended cleaning methods and materials.
- O. Provide protective covering for installed fixtures, water coolers, and trim.
- P. Do not allow use of fixtures for temporary facilities unless expressly approved in writing by Owner.

END OF SECTION

## SECTION 15430 - FACILITY PLUMBING EQUIPMENT

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Cleanouts.
  - 2. Floor drains.
  - 3. Trap primer.
  - 4. Water hammer arrester.
  - 5. Point of use mixing valve.

#### 1.2 SUBMITTALS

- A. Division 1: Submittal procedures.
- B. Submit manufacturer's product data, including performance data for each type of plumbing equipment listed in Section Includes paragraph above. Identify complete material data, model numbers, features, and optional items intended for application.

### PART 2 PRODUCTS

#### 2.1 CLEANOUTS

- A. General: Size cleanouts full size of pipe to four inches and not less than four inches for larger sizes.
- B. Floor Type:
  - 1. FCO: Refer to Plumbing Equipment Schedule located on Drawing P-1.

#### 2.2 FLOOR DRAINS

- A. FD-1: Refer to Plumbing Equipment Schedule located on Drawing P-1.

#### 2.3 TRAP PRIMERS

- A. TP-1: Refer to Plumbing Equipment Schedule located on Drawing P-1.

#### 2.4 WATER HAMMER ARRESTER

- A. Refer to Plumbing Equipment Schedule located on Drawing P-1.

#### 2.5 POINT OF USE MIXING VALVE

- A. Refer to Plumbing Equipment Schedule located on Drawing P-1.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Extend cleanouts to finished surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Install cleanouts with clearances for snaking drainage system.
- B. Install floor cleanouts at elevation to accommodate finished floor.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Excavate and backfill in accordance with architectural division of specifications.
- E. Install bell and spigot pipe with bell end upstream.
- F. Install water hammer arrestors complete with accessible isolation valve on all flush-valve branch water piping before last fixture take-off and as recommended by manufacturer.
- G. Install unions downstream of valves and at equipment or apparatus connections.

### 3.2 TESTING OF PIPING SYSTEMS

- A. Test new portion of domestic cold water and hot water piping in accordance with the following:
  - 1. Leave joints and welds exposed for examination during testing.
  - 2. Isolate equipment not to be subjected to test pressure.
  - 3. Hydrostatically test system at 125 psig for 10 minutes.
  - 4. Visually examine piping, joints, and connections for leakage.
  - 5. Repair or replace components to eliminate leaks.
  - 6. Retest system until no leaks are found.
  - 7. Upon successful completion relieve system of pressure and put into normal operation.
- B. Upon successful completion of test, sterilize potable water lines before connecting permanently to source of potable water.
- C. Test natural gas piping in accordance with local utility requirements.
- D. Test sanitary sewer systems in accordance with local authority having jurisdiction.

### 3.3 CLEANING AND DISINFECTION

- A. Domestic Water System: Clean and disinfect domestic water system in accordance with Ohio Plumbing Code and the International Plumbing Code.

END OF SECTION

## SECTION 15800 - HVAC AIR DISTRIBUTION

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Metal ductwork.
  - 2. Flexible ductwork.
  - 3. Ductwork fabrication.
  - 4. Air turning devices.
  - 5. Volume control dampers.
  - 6. Grilles, Registers, and Diffusers.
  - 7. Duct cleaning.
  - 8. Duct system pressure test.

#### 1.2 SUBMITTALS

- A. Division 1: Procedure for submittals.
- B. Product Data: Submit product data for the following:
  - 1. Metal ductwork.
  - 2. Flexible ductwork.
  - 3. Ductwork fabrication.
  - 4. Air turning devices.
  - 5. Volume control dampers.
  - 6. Grilles, Registers, and Diffusers.
  - 7. Duct cleaning.
  - 8. Duct system pressure test.
- C. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

#### 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

#### 1.4 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A standards.

#### 1.5 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.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.
- B. Storage: Store materials in a dry area indoor, protected from damage.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having G60 zinc coating in conformance with ASTM A90.
- B. Insulated Flexible Ducts:
  - 1. Manufacturers:
    - a. Atco.
    - b. Clewaflex.
    - c. Flexmaster.
  - 2. Two ply aluminum supported by helically wound spring steel wire; fiberglass insulation; aluminized vapor barrier film.
  - 3. Pressure Rating: 10 inches water gage positive and 1.0 inches water gage negative.
  - 4. Maximum Velocity: 4000 fpm.
  - 5. Temperature Range: -10 degrees F to 160 degrees F.
  - 6. Furnish each flexible duct section with integral clamping devices for connection to round or oval fittings.
  - 7. Join each flexible duct section to main trunk duct through sheet metal fittings. Construct fittings of galvanized steel and equip with factory installed volume damper having positive locking regulator. Provide fittings installed in lined ductwork with insulation guard.
- C. Hanger Rod: ASTM A36; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

### 2.2 DUCTWORK FABRICATION

- A. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards). Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

- C. Construct duct system for the following pressure classifications:
  - 1. Constant volume supply air duct systems: 1 inch water gage regardless of velocity.
  - 2. Return air duct systems: 1 inch water gage regardless of velocity.
  - 3. Exhaust air duct systems: 1 inch water gage regardless of velocity.
- D. 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.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- F. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
- G. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

### 2.3 AIR TURNING DEVICES

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

### 2.4 DUCT TEST HOLES

- A. Temporary Test Holes: Cut or drill in ducts. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

### 2.5 GRILLES, REGISTERS, AND DIFFUSERS

- A. Manufacturer:
  - 1. Price
  - 2. Eger
  - 3. Titus.
- B. General: Grille, register, and diffuser information mark, model number, type, finish, and accessory items are indicated in schedule. Locations, size, type, cfm, and directions of throw are indicated on floor plans.
- C. Definitions: Terms used for grilles, registers, and diffusers are as follows:
  - 1. Grilles: Same style as registers but without damper.

- 2. Registers: Items labeled as registers are to be provided with opposed blade dampers.
- D. Finish: Furnish grilles, registers and diffusers with factory applied finish. Color to be by Architect.
- E. Refer to Drawings for exact location of ceiling diffusers.

## PART 3 EXECUTION

### 3.1 INSTALLATION OF DUCT SYSTEMS

- A. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- C. Install round longitudinal seam ductwork for supply air applications only. Do not use for return air and exhaust air applications.
- D. Provide openings in ductwork to accommodate thermometers and controllers. Provide pilot tube openings 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 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 terminal units to supply ducts with 5 feet maximum length of flexible duct. Do not use flexible duct to change direction.
- I. Connect diffusers to low pressure ducts with 5 feet maximum length of flexible duct held in place with strap or clamp.
- J. Paint ductwork visible behind air outlets and inlets matte black.
- K. Connect metallic flexible ducts to metal ducts with adhesive plus sheet metal screws.
- L. Connect nonmetallic flexible ducts to metal ducts with adhesive plus drawbands.
- M. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

### 3.2 INSTALLATION - DUCT ACCESSORIES

- A. Install duct accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- B. Provide duct test holes for testing and balancing purposes.
- C. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of diffuser, grille, or register assembly.

### 3.3 FIELD QUALITY CONTROL – DUCT LEAKAGE TEST

- A. Perform leakage tests on the following:
  - 1. Entire supply air duct system upstream of terminal boxes.
  - 2. Supply air ductwork downstream of terminal boxes carrying over 1000 cfm.
- B. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and as required for compliance with test requirements.
- C. Conduct tests, in presence of Construction Manager, at static pressures equal to maximum design pressure of system or section being tested. If pressure classifications are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.
- D. Maximum Allowable Leakage:
  - 1. Round Ducts: Comply with requirements for Leakage Classification 3.
  - 2. Rectangular Ducts in pressure classification less than and equal 2 inch wg both positive and negative pressures: Comply with requirements for Leakage Classification 12.
  - 3. Rectangular Ducts in pressure classification from 2 to 10 inch wg: Comply with requirements for Leakage Classification 6.
- E. Remake leaking joints and retest until leakage is less than maximum allowable.
- F. Leakage Test: Perform tests according to SMACNA's "HVAC Air Duct Leakage Test Manual."

END OF SECTION

## SECTION 15950 - TESTING, ADJUSTING, AND BALANCING

### PART 1 GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Testing, adjustment, and balancing of air systems.
  - 2. Measurement of final operating condition of HVAC systems.

#### 1.2 SUBMITTALS

- A. Division 1: Procedure for submittals.
- B. Submit name of adjusting and balancing agency for approval within 30 days after award of Contract.
- C. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- D. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required.
- E. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect for inclusion in operating and maintenance manuals.
- F. 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.
- G. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
- H. Test Reports: Indicate data on AABC National Standards for Total System Balance forms.

#### 1.3 PROJECT RECORD DOCUMENTS

- A. Record actual locations of balancing valves and rough setting.

#### 1.4 QUALITY ASSURANCE

- A. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance.

## 1.5 QUALIFICATIONS

- A. Perform work under supervision of AABC Certified Test and Balance Engineer.

## 1.6 PRE-BALANCING CONFERENCE

- A. Convene one week prior to commencing work of this section.

## 1.7 SEQUENCING

- A. Sequence work to commence after completion of systems and schedule completion of work before Substantial Completion of Project.

## 1.8 SCHEDULING

- A. Schedule and provide assistance in final adjustment and test of life safety system with Fire Authority.

## PART 2 PRODUCTS

- A. Not used

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
  1. Systems are started and operating in 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. 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.
  10. Air outlets are installed and connected.
  11. Duct system leakage is minimized and tests are completed.
- B. Submit field reports. Report defects and deficiencies noted during performance of services preventing system balance.
- C. 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 Architect/Engineer 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.

### 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.

### 3.5 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. 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.
- F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
- H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance each VAV box of variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- L. 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 building entries.

### 3.6 SCHEDULES

- A. Equipment Requiring Testing, Adjusting, and Balancing:
  - 1. Dedicated Outside Air Units.
  - 2. Air cooled condensing units
  - 3. Air cooled heat pumps
  - 4. Air handling units.
  - 5. Fans.
  - 6. Air inlets and outlets.
- B. 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.

- C. Summary Comments:
  - 1. Design versus final performance.
  - 2. Notable characteristics of system.
  - 3. Description of systems operation sequence.
  - 4. Summary of outdoor and exhaust flows to indicate amount of building pressurization.
  - 5. Nomenclature used throughout report.
  - 6. Test conditions.
  
- D. Instrument List:
  - 1. Instrument.
  - 2. Manufacturer.
  - 3. Model number.
  - 4. Serial number.
  - 5. Range.
  - 6. Calibration date.
  
- E. Electric Motors:
  - 1. Manufacturer.
  - 2. Model/Frame.
  - 3. HP/BHP.
  - 4. Phase, voltage, amperage; nameplate, actual, no load.
  - 5. RPM.
  - 6. Service factor.
  - 7. Starter size, rating, heater elements.
  - 8. Sheave Make/Size/Bore.
  
- F. V-Belt Drive:
  - 1. Identification/location.
  - 2. Required driven RPM.
  - 3. Driven sheave, diameter and RPM.
  - 4. Belt, size and quantity.
  - 5. Motor sheave diameter and RPM.
  - 6. Center to center distance, maximum, minimum, and actual.

- G. Air Cooled Condenser:
  - 1. Identification/number.
  - 2. Location.
  - 3. Manufacturer.
  - 4. Model number.
  - 5. Serial number.
  - 6. Entering DB air temperature, design and actual.
  - 7. Leaving DB air temperature, design and actual.
  - 8. Number of compressors.
  
- H. Cooling Coil Data:
  - 1. Identification/number.
  - 2. Location.
  - 3. Manufacturer.
  - 4. Air flow, design and actual.
  - 5. Entering air DB temperature, design and actual.
  - 6. Entering air WB temperature, design and actual.
  - 7. Leaving air DB temperature, design and actual.
  - 8. Leaving air WB temperature, design and actual.
  - 9. Water flow, design and actual.
  - 10. Water pressure drop, design and actual.
  - 11. Entering water temperature, design and actual.
  - 12. Leaving water temperature, design and actual.
  - 13. Saturated suction temperature, design and actual.
  - 14. Air pressure drop, design and actual.
  
- I. Air Moving Equipment:
  - 1. Location.
  - 2. Manufacturer.
  - 3. Model number.
  - 4. Serial number.
  - 5. Arrangement/Class/Discharge.
  - 6. Air flow, specified and actual.
  - 7. Return air flow, specified and actual.
  - 8. Outside air flow, specified and actual.
  - 9. Total static pressure (total external), specified and actual.
  - 10. Inlet pressure.
  - 11. Discharge pressure.
  - 12. Sheave Make/Size/Bore.
  - 13. Number of Belts/Make/Size.
  - 14. Fan RPM.

- J. Return Air/Outside Air Data:
  - 1. Identification/location.
  - 2. Design air flow.
  - 3. Actual air flow.
  - 4. Design return air flow.
  - 5. Actual return air flow.
  - 6. Design outside air flow.
  - 7. Actual outside air flow.
  - 8. Return air temperature.
  - 9. Outside air temperature.
  - 10. Required mixed air temperature.
  - 11. Actual mixed air temperature.
  - 12. Design outside/return air ratio.
  - 13. Actual outside/return air ratio.
  
- K. Exhaust Fan Data:
  - 1. Location.
  - 2. Manufacturer.
  - 3. Model number.
  - 4. Serial number.
  - 5. Air flow, specified and actual.
  - 6. Total static pressure (total external), specified and actual.
  - 7. Inlet pressure.
  - 8. Discharge pressure.
  - 9. Sheave Make/Size/Bore.
  - 10. Number of Belts/Make/Size.
  - 11. Fan RPM.
  
- L. Duct Traverse:
  - 1. System zone/branch.
  - 2. Duct size.
  - 3. Area.
  - 4. Design velocity.
  - 5. Design air flow.
  - 6. Test velocity.
  - 7. Test air flow.
  - 8. Duct static pressure.
  - 9. Air temperature.
  - 10. Air correction factor.

- M. Duct Leak Test:
1. Description of ductwork under test.
  2. Duct design operating pressure.
  3. Duct design test static pressure.
  4. Duct capacity, air flow.
  5. Maximum allowable leakage duct capacity times leak factor.
  6. Test apparatus:
    - a. Blower.
    - b. Orifice, tube size.
    - c. Orifice size.
    - d. Calibrated.
  7. Test static pressure.
  8. Test orifice differential pressure.
  9. Leakage.
- N. Air Distribution Test Sheet:
1. Air handling unit number.
  2. Room number/location.
  3. Air handling unit type.
  4. Air handling unit size.
  5. Area factor.
  6. Design velocity.
  7. Design air flow.
  8. Test (final) velocity.
  9. Test (final) air flow.
  10. Percent of design air flow.

END OF SECTION

## SECTION 16010 - GENERAL REQUIREMENTS

### PART 1 GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Refer to Division 0 and Division 1 and all addenda which are a part of this Section, and all subsequent Sections of Division 16.
- B. Refer to Alternate Proposals for possible changes affecting the extent of this Section of Work.
- C. This Contractor is instructed to review all Specifications of all parts of the Work.
- D. The Work required under Division 16 of the Specifications includes all requirements of all Sections of this Division. In general, the Work consists of furnishing and installing the equipment, service and all other materials necessary to provide the complete electrical system and all work in connection with such systems including labor, transportation, etc., complete in every respect as shown on the plans, herein specified, or reasonably implied as ready for use unless it is otherwise specifically noted or otherwise specified.
- E. The Contractor is also referred to Architectural, Structural, Mechanical and other drawings pertaining to the project. The above mentioned Construction Documents, as well as their respective Specifications, are part of the complete Contract Documents.

#### 1.2 DESCRIPTION OF WORK

- A. This work involves the renovation of the existing building, with new or modified electrical services installed, wired and ready for use by the Owner.
- B. Work includes, but is not limited to, the following:
  - 1. Provide the new conduits and boxes for the power and communications systems complete with mounting hardware and conduit arrangements.
  - 2. Provide the complete extension of the existing power distribution system for the renovated area. Provide all feeders, panelboards, junction and pull boxes to complete the renovated area's lighting and power systems as shown, stated, or reasonably implied.
  - 3. Provide branch circuit panelboard and all branch circuit wiring to all equipment furnished in this work or other trades in order to provide for all power supply needed to complete the building's electrical system as shown, stated, or reasonably implied.
  - 4. Provide relocation of existing lighting fixtures.
  - 5. Provide all wiring devices and all power outlets completely wired and mounted as shown, stated, or implied.
  - 6. Provide all communications conduits and outlets for tele/communications and other building communications systems, complete with provisions for installation of wiring and equipment as shown, stated, or implied.

### 1.3 WORK NOT INCLUDED

- A. Do not provide motors, appliances, tables, work benches, or desks.
- B. Do not provide tele/communications wiring or equipment but do provide boxes, covers and conduits with pull-wires to allow for installation of equipment by the Owner.
- C. Do not provide low voltage control wiring, (120 volt and below), for heating, ventilating and air conditioning systems, except as hereinbefore stated.

### 1.4 GENERAL

- A. It is the purpose of the Construction Documents to indicate the approximate locations of all equipment, outlets, etc. The exact location of apparatus and outlets may be given from time to time as the work progresses. This Contractor shall ascertain from the Owner's Representative the exact locations and arrange his work accordingly. The Owner's Representative reserves the right to effect reasonable changes in the location of outlets up to the time of roughing-in without additional cost. Exact raceway routings, required pull-boxes and other details are left to the good judgment of the Contractor to produce the most satisfactory installation at least cost.
- B. This Contractor shall take all field measurements necessary for this work and shall assume responsibility for their accuracy. Do not scale drawings. Any interferences or field problems shall be reported to the Owner's Representative for resolution.
- C. All items of labor, materials, and equipment not specifically described herein or shown on the plans, but incidental to, or required for, the complete installation and proper operation of the work shall be furnished as if called for in detail by the Specifications or Construction Documents.
- D. It is the intent of the Contract Electrical Construction Documents and Specifications to describe as accurately as possible the work required. Should any errors, omissions or interferences with other trades be found, they shall be brought to the attention of the Owner's Representative for resolution. Minor discrepancies and interferences in locations of outlets, conduits, routings, and fixture locations shall be resolved by the Contractor under field conditions and shall not be justification for additional cost. The Contractor is responsible for the coordination required for conduits to be routed in walls, ceilings or floors as they may occur. The intent is for all conduits to be concealed and all devices flush.
- E. The design described herein is intended to comply with applicable codes and standards, and with safeguards in excess of code requirements where necessary. It is the responsibility of the Contractor to maintain these standards for achieving a complete and safe installation and to observe and report to the Owner's Representative any items which in his opinion do not conform to the codes and standards or which would improve the safety and/or serviceability of the installation.

- F. Where any conflict between Construction Documents and Specifications exists, the Specifications shall take precedence.
- G. Wherever in these Documents the word "provide" is used, it shall be interpreted to mean "furnished and installed" by the Contractor.
- H. Wherever in these Documents the word "Contractor" or "Subcontractor" is used, it shall be understood to mean the Contractor bidding the work described herein.

#### 1.5 EQUIPMENT MANUFACTURER'S DIRECTIONS, DIAGRAMS, AND MANUALS

- A. Except where specifically permitted otherwise, all materials, equipment, and devices furnished by the Contractor shall be new and shall conform to NECA, NEMA, IEEE, ANSI, and Underwriter's Laboratories Standards where applicable and shall bear the CSA and/or UL listing or label mark.
- B. All manufactured articles and all other materials and equipment furnished by the Contractor shall be applied, connected, erected, used, cleaned, and conditioned as directed in the Manufacturer's latest printed instructions.
- C. The Contractor shall compile and deliver to the Owner before request for final payment all installation drawings, wiring diagrams, operating and maintenance manuals, etc. pertaining to all equipment furnished and installed by him.
- D. It shall be the Contractor's responsibility to consult the manufacturer's drawings, installation manuals and instructions for all equipment. All equipment shall be installed in strict accordance with these manuals and instructions.
- E. The Contractor shall arrange for complete testing of all new electrical equipment before energizing. Tests shall be performed by persons competent in test procedures and knowledgeable in their performance.
- F. Tests shall be performed in strict accordance with the manufacturer's written specifications and instructions. Any equipment which fails to pass proper testing procedures shall be repaired or replaced by the Contractor as the Owner selects. The cost of any and all repairs or replacements made necessary by faulty equipment supplied or installed by the Contractor shall be at the Contractor's expense and shall not be cause for extra compensation by the Owner.

#### 1.6 INSPECTION

- A. The Owner and his authorized representatives shall have access to and the privilege of inspecting all work and materials as the work progresses. These representatives will have authority to approve or reject any work or materials with the Construction Documents, Specifications, Codes and good engineering practice as a basis for any action taken.
- B. Any work found not in compliance with the Construction Documents, Specifications or applicable standards as listed herein shall be repaired or replaced by the Contractor, as deemed necessary by the Owner or his representatives. Any such additional work by the Contractor as considered

necessary by the Owner for the Contractor's work to comply with the Contract Documents as described herein shall not be justification for additional compensation by the Contractor.

#### 1.7 COORDINATION OF WORK

- A. This Contractor is responsible to meet all completion dates set by the Owner, and shall be able to furnish all labor of various classes required to meet schedules and completion dates. This Contractor shall familiarize himself with the various manufacturers on delivery and arrange for delivery of equipment and materials so as not to hinder or delay any completion dates for electrical work or other trades which are affected by the electrical work.

#### 1.8 SAFETY AND CLEANING UP

- A. It shall be the Contractor's responsibility to maintain a clean, safe work place while performing his work and upon leaving the site. Live electrical parts of fixtures, devices and equipment shall be completely protected to prevent accidental injury to others in the building. All stairways, halls and exits shall be left with free access. Tools, toolboxes, ladders, materials, etc., shall be kept in a confined area away from normally occupied areas when not in use.
- B. This Contractor shall use all possible care to avoid soiling the floors and walls. No cutting, threading or bending of conduit will be permitted in finished areas of the building. Oily waste, rags and other flammable materials must be removed from the building immediately after use. Accumulations of rubbish or stored materials of any kind will not be permitted in any public or finished area.
- C. The Contractor must include in his contract price the costs of barricades, signs, fall protection apparatus, fences and other safety devices which will be necessary to safeguard the workplace and excavations.
- D. This Contractor will be held responsible for damage to other work caused by his work or through the negligence of his workmen. All patching or repairing of damaged work shall be done by persons or Contractors normally experienced in the work to be performed; such Contractors or Subcontractors shall be subject to prior approval of the Owner's Representative. The cost of such work shall be paid by the Contractor.

#### 1.9 INTERFERENCES, CUTTING, AND PATCHING

- A. The Contractor shall predetermine the location, size, etc., of all chases and openings necessary in new construction for the installation of his work and shall be responsible to provide all such openings. He shall set all sleeves, inserts and hangers and be responsible for their proper location.
- B. All outlets, switches, and receptacles shall be centered with regard to paneling, trim, equipment, etc., and shall line with either bottom or top of masonry courses.
- C. Should any structural difficulties prevent the installation of outlets, setting of cabinets, running of conduits, or other electrical construction at points shown on

the Construction Documents, the minor deviations required for a satisfactory installation, as determined by the Owner's Representative, shall be performed at no additional cost.

- D. Do not provide general painting of interior raceways or boxes. However, all enclosures and equipment shall be left in like-new condition, and any finished painted surfaces shall be restored to original quality as furnished by its manufacturer.

#### 1.10 RECEIPT OF PORTABLE OR DETACHABLE PARTS

- A. The Contractor shall retain in his possession and shall be responsible for all portable or detachable portions of the installation such as fuses, keys, locks, etc., until the completion of the work, and shall turn them over to the Owner and obtain itemized receipt. This receipt, together with a certificate of approval, shall be attached to the Contractor's request for final payment.

### PART 2 PRODUCTS

#### 2.1 SHOP DRAWINGS

- A. The Contractor shall submit electronic copies of Manufacturer's certified drawings to the Owner's Representative for approval before purchasing the equipment. Contractor shall refer to General Conditions for exact submittal requirements. Failure to gain prior approval by the Owner's Representative shall not relieve the Contractor for supplying the equipment as specified herein. Shop Drawings are required on the following items:
  - 1. Branch circuit panelboard
- B. The Contractor shall review each set of Shop Drawings before submission to the Owner's Representative. The Contractor shall verify the Shop Drawings accurately and correctly identify the equipment as specified and sufficient information is included for the complete evaluation by the Owner's Representative.
- C. All Shop Drawings shall be stamped by the Contractor indicating the date and status of his review. No Shop Drawing shall be submitted to the Owner's Representative unless it has been reviewed and approved by the Contractor.
- D. The Contractor shall submit Shop Drawings of all equipment as stated even if no deviation of the specification is made and such equipment is exactly as specified herein.
- E. Specific submittal requirements and content may be listed in other sections. In general, provide submittals only as listed in these specifications, and only for pertinent equipment components; not general, unedited "marketing" type material.

## 2.2 STANDARDS AND SUBSTITUTIONS

- A. It is the intent of these Specifications to describe and require materials and equipment of a particular quality and standard. Wherever in these Documents a manufactured specific item is designated, the Contractor's proposal shall be based on furnishing the specific item as specified.
- B. Failure by the Contractor to gain acceptance of any or all such substitutions by the Owner's Representative shall in no manner be justification for additional cost or relieve the Contractor from providing the specified items herein described.
- C. The Owner's Representative reserves the right to accept or reject proposed substitutions and to limit or extend the time period allowed for their submittal.
- D. Wherever in these Specifications more than one manufacturer is listed for a specific item of equipment, the Contractor's proposal shall be based on furnishing equipment manufactured by one of those listed.
- E. Should the Contractor elect or choose other than the first item as specified, he shall be responsible to provide complete and proper fit, installation, operation, and adjustment for the equipment he intends to use. In addition, the Contractor shall provide any and all adjustments of other related or connected equipment which may be affected by the choice of the associated equipment.

## PART 3 EXECUTION

### 3.1 CODES, PERMITS, AND INSPECTIONS

- A. All work shall be executed in accordance with the latest National Electrical Code and the Ohio Building Code, and any Local, City, or County Codes in effect at the time of construction.
- B. At all times during which the Contractor or any Subcontractor are engaged in work covered by these Documents, all requirements of the Occupational Safety and Health Act shall be observed.
- C. The Contractor shall secure and pay for all permits from all agencies and obtain all inspections required for the completion of the electrical work. All permits and certificates of inspection and approval signed by the controlling building department shall be furnished in duplicate to the Owner's Representative and shall become the property of the Owner.

### 3.2 WORKMANSHIP

- A. All electrical work shall be installed under the direct supervision of a skilled journeyman electrical foreman. All work shall be tested, inspected, and certified approved as to materials and workmanship by proper authority prior to acceptance.

- B. The installation shall be installed and arranged so that its component parts will function as a workable system complete with all accessories necessary for its operation and shall be left with all equipment properly adjusted and in working order. The work shall be so executed in conformity with the best accepted standard practice so as to contribute to efficiency of operation and maintenance, maximum accessibility, and appearance and minimum cost in construction of future alterations and additions. It shall also be executed that the installation will conform with and adjust itself to the building structure its equipment and its usage.
- C. Electrical work shall be installed by journeyman electricians under the direct supervision of a competent foreman at all times. At no time shall electrical work be installed by apprentice electricians without the immediate on-the-job supervision of a journeyman electrician.
- D. The workmanship of all installed electrical equipment shall be subject to final approval of the Owner's Representative. Any work which does not meet recognized standards of proper installation shall be repaired or replaced by the Contractor at the Owner's Representative discretion. The cost of any repairs and/or replacements necessary due to faulty workmanship shall not be justification for additional compensation by the Contractor.

### 3.3 VISITING THE SITE

- A. The Contractor shall visit the site before submitting his proposal, compare the Construction Documents with the existing work and inform himself of all pertinent local conditions including location accessibility and general character of the site, the character and extent of existing work within or adjacent to the site, and any other work being performed thereon at the time of the submission of his bid. Failure to visit the site will in no way relieve the Contractor from the necessity of furnishing any materials or performing any work that may be required to complete the work in accordance with these Documents. Lack of knowledge will not be acceptable as a valid excuse for granting any extra compensation or for failure or neglect to perform any or all work in this Contract.

### 3.4 GUARANTEE OF CONTRACT WORK

- A. The Contractor shall guarantee the materials used in the installation herein specified are the best of their respective kinds and that they shall be put together in a thorough and workmanlike manner under the immediate supervision of the Contractor. He shall guarantee that he will correct any defects in workmanship, materials, or effectiveness of any portion of the apparatus within one (1) year after completion and acceptance of the installation. This is to be done without cost to the Owner, provided that such defects are due to faulty material and/or workmanship which were provided by the Contractor.
- B. Certain items of equipment may carry a requirement for longer guarantee periods, as specified elsewhere in the Contract Documents.

### 3.5 INTERFERENCES

- A. The work covered by this Specification consists of providing all labor, equipment, supplies, materials, permits and services required for the complete installation of the electrical work, ready for use. All items of labor, materials, and equipment not specifically described herein or shown on the plans, but incidental to, or required for, the complete installation and proper operation of the work shall be furnished as if called for in detail by the Specifications or Construction Documents.
- B. It is the intent of the Electrical Construction Documents and Specifications to describe as accurately as possible the work required. Should any inconsistencies, or interferences with other trades be found, they shall be brought to the attention of the Owner's Representative for resolution. Minor discrepancies and interferences in locations of outlets, conduit routing and fixture locations, shall be resolved by the Contractor under field conditions and shall not be justification for additional cost.

### 3.6 CHANGES IN WORK

- A. The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the work, with the contract "Lump Sum Price" being adjusted accordingly.

### 3.7 STORAGE OF MATERIALS

- A. Materials furnished and delivered by this Contractor for the work may be placed or stored on the property of the Owner only in a location as will be designated by the Owner or his representative. However, the Contractor shall assume full responsibility for all materials so stored.

### 3.8 PAINTING

- A. The Contractor shall provide painting of boxes, hangers, and supports used in all outdoor installations with rust inhibiting paints unless galvanized. In addition, all manufacturers' enclosures and equipment shall be left in like-new condition, and any furnished surfaces shall be restored to original quality.
- B. In general, exposed boxes, conduit and fittings in indoor locations will not require painting but shall have all surfaces as furnished by the manufacturer left in clean, like-new condition.
- C. All equipment, boxes, etc., installed outdoors exposed to weather shall be corrosion resistant with a protection of galvanizing or not less than two (2) coats of rust inhibiting paints.

### 3.9 RECORD DRAWINGS

- A. Whenever field changes, modifications or revisions to the Contract Construction Documents are permitted or required, it shall be the Contractor's responsibility to record such changes on a set of the contract construction prints. These prints

shall not be utilized for any other purpose. Field changes shall be recorded to indicate as neatly and accurately as possible all changes in locations, routing and other incidental information as necessary to convey to the Owner the exact as-installed status of the electrical system.

- B. The Contractor shall record final locations of all underground lines within or outside the building by depth from finished floor or grade and by offset measurement from building components or surface improvements such as building columns, building walls, curbs, edges of walks, etc.

### 3.10 SMOKE AND FIRE BARRIERS

- A. The Contractor shall be responsible to locate and provide all openings in floors, ceilings and walls to allow for his conduit penetrations. All conduit penetrations shall be sleeved using steel casings embedded in concrete floors or by core drilling. The Contractor shall submit to the Owner's Representative all locations and sizes of openings which must be provided for this work before drilling or setting any sleeves. Final locations and sizes of all openings shall be subject to the Owner's Representative final approval.
- B. The Contractor shall provide all fire stops and smoke and fire barriers around all conduit penetrations provided under this work. All fire barriers shall be UL listed and recognized suitable by factory mutual and NFPA. Fire barriers shall restore all surfaces to be at least one hour, or the minimum fire rating of the floor, wall or ceiling penetrated. Barriers shall completely fill the openings and shall be securely anchored to prevent accidental removal. All smoke and fire barriers shall be made using only recognized materials and will be acceptable subject to the Owner's Representative final approval. Smoke and fire barriers may be Fire Seal, STI, DuPont or U.S. Gypsum.
- C. Firestopping materials shall conform to Flame (F) and Temperature (T) ratings required by local building code and as tested by nationally accepted test agencies per ASTM E-184 or UL 1479 fire tests in a configuration that is representative of field conditions.
- D. Manufacturer's engineering judgments shall be accepted for non-standard applications or where no tested system exists. Drawings for engineering judgments must indicate the UL tested system or systems upon which the judgment is based, in order to evaluate the engineering judgment against a known performance.
- E. Firestopping material shall be non-halogenated, lead and asbestos free and shall not incorporate nor require the use of hazardous solvents.
- F. Firestop products which dissolve in water after curing are not acceptable.
- G. Firestopping materials shall not shrink upon drying as evidenced by cracking or pulling back from contact surfaces.
- H. All firestopping materials for the electrical work shall be manufactured by one manufacturer (to the maximum extent possible).

- I. Firestopping shall be performed by a Contractor trained and approved by the Firestop Manufacturer.

### 3.11 FUTURE ADDITIONS

- A. Note that certain provisions have been made in this installation to allow for the installation of future equipment and extension of wiring. The Contractor shall arrange his work under this contract to allow for installation of the future work. In no way shall any work performed under this contract interfere with or prevent installation of such future additions when and if required.

### 3.12 IDENTIFICATION

- B. The Contractor shall provide fully engraved micarta nameplates to match existing equipment nameplates for panelboards. Each plate shall identify the equipment, voltage class, phase, ampere rating and purpose of the specific circuit or equipment involved. Nameplates shall be fixed to equipment enclosures with rivet pins or epoxy adhesive.

END OF SECTION

## SECTION 16020 - ELECTRICAL DEMOLITION

### PART 1 GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. Contractor shall visit and examine the site prior to bidding to ascertain the existing conditions and limits of demolition and construction. Adjoining areas shall be maintained in operation.
- B. Remove all items of existing construction not to remain as a part of the final project. Unless otherwise noted:
  - 1. Remove all existing electrical equipment, wiring, and conduit in the areas to be renovated, in this project.
  - 2. Existing equipment serving other areas, but interfering with the construction, shall be relocated as necessary.
  - 3. Certain items of electrical equipment are noted to be relocated and reinstalled as part of this project.
- C. Any demolition indicated on the Construction Documents is shown in general to indicate the extent of demolition and is not to be considered as a record drawing of existing conditions. Accordingly, the Contractor shall be responsible for complete demolition of the electrical work indicated including any buried items or any existing items not shown on the Construction Documents. Before demolition and before submission of proposed methods and operations, the Contractor shall be responsible to obtain, for reference, any existing record Construction Documents and to conduct any appropriate field testing to determine the nature of the existing electrical work to be demolished.
- D. Protect existing work remaining in place, and protect the public.
- E. Repair and restore to original sound condition all items or portions of electrical work which are not noted to be demolished, but are damaged by work under this contract.
- F. It shall be the Contractor's responsibility to protect and retain power to all existing active equipment which shall remain.
- G. Contractor shall reconnect any equipment being disturbed by this renovation yet required for continued service to same or nearest available panel.
- H. Where work by the General Contractor (wall removal, new or relocated wall opening, etc.), results in the removal, relocation, or refeeding of electrical devices or lighting fixtures, the Contractor shall disconnect or reconnect as required all active devices remaining on that circuit or system.
- I. Contractor shall "ring out" all circuits in existing panel affected by this alteration. Where additional circuits are needed, reuse circuits available for reuse, or provide new circuits. Tag all unused circuits as spare, replace all inoperative or defective circuit breakers. Tighten all connections.

## PART 2 PRODUCTS AND PROCEDURES

### 2.1 COORDINATION

- A. Coordinate and sequence demolition so as not to cause shut-down of operation of surrounding areas.
- B. Do not proceed with demolition without written authority to proceed.
- C. Proceed with demolition in a systematic manner and coordinate all trades involved.
- D. Carefully remove equipment, materials, or fixtures which are to be reused.
- E. Disconnect or shut off service to areas where electrical work is to be removed. Remove all electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not a part of the final project in all areas where work of this contract is to be performed.
- F. Refer to the mechanical Construction Documents for mechanical equipment which must be disconnected by this Contractor for removal or abandonment by the Mechanical Contractor.
- G. Remove all conduit wire, boxes, and fastening devices, as required to avoid any interference with new installation. Abandoned underground conduit to be capped at both ends.

### 2.2 SHUT-DOWN PERIODS

- A. Arrange timing of shut-down periods of all in-service panels with Owner or his representative. Do not shut down any utility without prior written approval.

## PART 3 EXECUTION

### 3.1 EXISTING PANELBOARDS

- A. Where existing circuits are indicated to be reused, Contractor to use sensing measuring devices to verify that circuits feed project area or are not in use.
- B. Remove existing conduit and/or wiring no longer in use from panel back to equipment.
- C. Provide new typewritten updated directories where existing circuits have been modified or re-assigned.

### 3.2 SALVAGEABLE ITEMS

- A. Items of salvageable value to the Owner shall be removed and protected by the Contractor and turned over to the Owner as directed.

- B. All removed equipment shall be disposed of by this Contractor unless directed to do otherwise by the Owner's Representative. Disposal responsibilities include:
  - 1. Mercury Abatement
    - a. Remove and recycle mercury containing fluorescent and HID lamps as universal waste, in accordance with the EPA universal waste rule.
    - b. All Mercury-related operations shall be performed in accordance with the EPA universal waste rule. Regulation 40 CFR Parts 260, 261, 264, 265, 268, 270 and 273 for mercury containing fluorescent and HID lamps.
  - 2. PCB Abatement
    - a. Remove and incinerate ballasts which contain polychlorinated biphenyl (PCB), in accordance with current environmental regulations.
    - b. All PCB-related operations shall be performed in accordance with EPA Regulation 40 CFR 761, Polychlorinated Biphenyls, Manufacturing, Process, Distribution in Commercial Use Prohibition.
  
- C. Items of salvageable value to the Contractor may be removed as the work progresses. Salvaged items must be transported from the site as they are removed. Storage or sale of removed items on the site will not be permitted.

### 3.3 REUSABLE ELECTRICAL EQUIPMENT

- A. Disconnect, remove, or relocate all existing electrical material and equipment that interferes with new installation. This includes, but is not limited to; panels, lighting fixtures, wiring devices, etc.
  
- B. Relocate existing lighting fixtures as indicated on plans. Fixtures shall be cleaned and re-lamped, also tested to confirm if fixture is in good working condition before installation at new location.

END OF SECTION

## SECTION 16416 - PANELBOARDS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

#### 1.2 SUBMITTALS

- A. Product Data: For each type of panelboard, overcurrent 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. UL listing for series rating of installed devices.
    - e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  - 2. Wiring Diagrams: Power, signal, and control wiring.
  - 3. Field quality-control test reports.
  - 4. Operation and maintenance data.

#### 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 NEMA PB 1.
- C. Comply with NFPA 70.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Product: Square D; Schneider Electric. Subject to compliance with requirements, provide the specified product or a comparable product manufactured by one of the following:
  - 1. Panelboards, Overcurrent Protective Devices, Contactors, and Accessories:
    - a. Eaton Corporation; Cutler-Hammer Products.
    - b. General Electric Co.; Electrical Distribution & Protection Div.
    - c. Siemens Energy & Automation, Inc.

### 2.2 MANUFACTURED UNITS

- A. Enclosures: Surface-mounted cabinets. NEMA PB 1, Type 1.
  - 1. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  - 2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Note: "Door-in-Door" front covers are also acceptable.
- B. Phase and Ground Buses: Hard-drawn copper, 98 percent conductivity.
- C. Conductor Connectors: Suitable for use with conductor material.
  - 1. Ground Lugs and Bus Configured Terminators: Compression type.
- 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.
- F. Panelboard Short-Circuit Rating:
  - 1. UL label indicating series-connected rating with integral or remote upstream overcurrent protective devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.
  - 2. Fully rated to interrupt symmetrical short-circuit current available at terminals.

### 2.3 DISTRIBUTION PANELBOARDS

- A. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- B. Main Overcurrent Protective Devices: Circuit breaker.
- C. Branch Overcurrent Protective Devices:

1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in circuit breakers.

## 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; 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.
  1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits.
  2. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
    - a. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    - b. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

## 2.6 ACCESSORY COMPONENTS AND FEATURES

- A. Furnish accessory set including tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.
- B. Furnish portable test set to test functions of solid-state trip devices without removal from panelboard.
- C. Fungus Proofing: Permanent fungicidal treatment for panelboard interior, including overcurrent protective devices and other components.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Comply with mounting and anchoring requirements published by the manufacturer.
- C. Mount top of trim 72 inches above finished floor, unless otherwise indicated.

- D. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- E. Install filler plates in unused spaces.
- F. Stub three 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub three 1-inch empty conduits into raised floor space or below slab not on grade.
- G. Panelboard Nameplates and Circuit Identification: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws. Provide a typewritten panel circuit directory to identify the load on each active circuit.
- H. Ground equipment according to Division 16 Section "Grounding".
- I. Connect wiring according to Division 16 Section "Conductors".

### 3.2 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.

END OF SECTION

## SECTION 16519 - CONDUCTORS

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Provide all labor, material, equipment, tools, and services necessary for, and incidental to, the proper installation of the complete electrical wire and cable systems herein specified, and as shown on the Construction Documents.

#### 1.2 QUALITY ASSURANCE

- A. All conductors shall be copper and shall conform to the requirements of the National Electrical Code (NEC), IACS, ASTM, and IPCEA, and shall be Underwriters Laboratories Listed.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from damage prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible and free from damage or deteriorating elements.
- B. In general, do not deliver items of electrical equipment to the project substantially before the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installations within three (3) weeks of receipt.
- C. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage and handling.

### PART 2 PRODUCTS

#### 2.1 FABRICATION AND MANUFACTURE

- A. All feeder, branch circuit and control conductors shall be 600 volt, 90 degree centigrade, single conductor copper cables, Type 'THWN', 'THHN' or XHHW.
- B. Wiring in fluorescent fixture channels shall be Type 'THHN' insulation rated at 90 degrees centigrade.
- C. All other special power cable and signal wires shall be as noted on Construction Documents and/or hereinafter specified.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. For extension of existing distribution systems, match the color-coding used in the existing systems, as required by the National Electric Code.
- B. All rough-in work in the building shall be completed before wires are installed into conduits. The conduits shall be cleaned out by pulling a swab through the tubing with a fish tape, and wires shall be pulled through conduit in such a manner as to avoid kinking or injuring the insulation. Thermoplastic wire shall not be pulled where ambient temperatures are lower than 15 degrees F.
- C. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage and handling.
- D. All joints and splices in wire #10 AWG and smaller shall be twisted and made mechanically strong with electrical spring pressure type connectors similar to "Scotch-lok" of proper size, rated 600 Volts and shall be wrapped with half lapped layers of plastic tape.
- E. Solderless type connectors of approved and accepted types shall be used on splices and taps in wires #8 AWG and larger. All splices shall be insulated with a minimum of two (2) half-lapped layers of "Scotch" #88 and #22 plastic tape. All connectors having irregular surfaces shall be properly padded with "Scotch-fill" to eliminate sharp corners and voids before applying plastic tape.
- F. Branch circuit wires in panels shall be neatly arranged with all surplus wire cut off and all wires tied with nonmetallic ties. Metallic ties will not be permitted. Only one conductor shall be attached to a terminal screw or lug unless terminal is UL Listed for more than one (1) terminal.
- G. All mechanical wire and cable termination shall be torque tightened with torque wrench or torque screwdriver to manufacturers recommended torque values.

END OF SECTION

## SECTION 16520 - METAL CLAD CABLE

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Provide all labor, material, equipment, tools, and services necessary for, and incidental to, the proper installation of a type MC cable branch circuit system.

#### 1.2 QUALITY ASSURANCE

- A. All cable and fittings shall conform to the requirements of the National Electrical Code (NEC), NEMA, JIC, ANSI, and shall be labeled with the Underwriter's Laboratories Seal of Inspection.
- B. Metal Clad Cable shall be constructed in strict accordance with Underwriter's Laboratories, Inc., standard for Metal Clad Cables, UL 1569. The cable shall bear the UL label and the manufacturer's 'E' number. In addition, Metal Clad Cable must meet the requirements of the latest edition of the NEC, NFPA 70, Article 330, Metal Clad Cable.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from damage prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible, and free from damage or deteriorating elements.
- B. In general, do not deliver items of electrical equipment to the project substantially before the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installation within three (3) weeks of receipt.
- C. Deliver products to project properly identified with names, types, grades, compliance labels, and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage, and handling.

#### 1.4 PERMITTED USE

- A. Type MC cable may only be used in lieu of conduit and wire for 20 ampere or 30 ampere branch circuits installed within stud walls, furred walls, above accessible ceilings or concealed in casework.
- B. Do not use type MC cable for branch circuit homeruns to panels, or any exposed locations.

#### 1.5 SUBMITTALS

- A. Shop Drawings, if listed in Section 16010 shall be submitted for all equipment provided under this Section.

1. Product Data: Provide literature for the MC cable and connectors, including construction details and UL 'E' number.
2. Test Reports: If requested, provide UL test report for MC cable.
3. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use, if any.

## PART 2 PRODUCTS

### 2.1 QUALIFICATIONS

- A. Manufacturer: Southwire, "MCAP", type MC all purpose cable, or equivalent.

### 2.2 METAL CLAD CABLE

- A. Description: Metal Clad Cable.
- B. Conductor: Copper, Solid, or Stranded.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation Temperature Rating: 90 degrees C.
- E. Insulation Material: Thermoplastic (THHN), or equivalent.
- F. Armor Material: Aluminum, of the Class A Type.
- G. Armor Design: Interlocked type.
- H. Grounding: Outside Armor - For non-essential branch circuits in health care facilities, and when GFCI circuits are specified, a redundant and isolated grounding path is required.
- I. Use only UL "MC" connectors listed for the purpose.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install MC cable in accordance with manufacturers instructions and strict accordance with Article 300 and Article 330, NFPA 70. Follow manufacturer's explicit instructions when connecting the cable to fittings and boxes.
- B. Installation shall be neat and workmanlike, supported and routed with, or at right angles to the building or wall structure.
- C. Verify continuity of each branch circuit conductor.

END OF SECTION

## SECTION 16526 - GROUNDING

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Provide all labor, material, equipment, tools, and services necessary for, and incidental to, the proper installation of the complete electrical grounding systems herein specified, and as shown on the Construction Documents.

#### 1.2 QUALITY ASSURANCE

- A. All grounding materials and equipment shall be copper and/or copper clad and shall conform to the requirements of the National Electrical Code (NEC), IEEE, NEMA, JIC, ANSI, and shall be labeled with the Underwriters' Laboratories Seal of Inspection.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from damage prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible and free from damage or deteriorating elements.
- B. In general, do not deliver items of electrical equipment to the project substantially before the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installations within three (3) weeks of receipt.
- C. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage and handling.

#### 1.4 PERFORMANCE, SEQUENCING, AND SCHEDULING

- A. The Contractor is responsible to test the entire grounding system, including all conductors and connections before the power distribution system is energized. Improper grounding conditions shall be corrected before occupancy of the building.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Provide a copper equipment grounding busbar in all branch circuit panelboards and distribution panels.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. The entire light and power system shall be permanently and effectively grounded in accordance with the latest issue of the National Electrical Code, including service equipment, panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of the electrical equipment.
- B. All cord connected appliance frames shall be grounded to the conduit system through a grounding conductor in the cord. Flexible connections to motors shall be jumped with a braid equipment grounding conductor.
- C. Flexible metallic conduit equipment connections utilized in conjunction with single phase branch circuits shall be provided with suitable green insulated grounding conductors connected to approved grounding terminals at each end of the flexible conduit.
- D. Neutral conductors shall be grounded at the source, but they shall not be used for equipment grounding.
- E. Identify equipment grounding conductors by a green color code, and neutral conductors with a white color code.
- F. Grounding of the electrical system shall be by means of insulated grounding conductor installed with all feeders and branch circuit conductors in all conduits. Grounding conductors shall be sized in accordance with NEC 250 and shall run from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground all conduits by means of grounding bushings on terminations at panelboards with an installed #12 conductor to grounding bus.
- G. Grounding conductors shall be stranded.

END OF SECTION

## SECTION 16530 - WIRING DEVICES

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Provide all labor, materials, equipment, tools, and services necessary for, and incidental to, the proper installation of all wiring devices, such as switches, receptacles, plates, etc., herein specified, and as shown on the Construction Documents.

#### 1.2 QUALITY ASSURANCE

- A. All wiring devices shall conform to the requirements of the National Electrical Code (NEC), NEMA, ANSI, and shall be labeled with the Underwriters Laboratories Seal of Inspection.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from damage prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible, and free from damage or deteriorating elements.
- B. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage, and handling.

#### 1.4 SUBMITTALS

- A. Shop Drawings, if listed in 16010, shall be submitted for all equipment under this Section.

### PART 2 PRODUCTS

#### 2.1 FABRICATION AND MANUFACTURE

- A. Hubbell devices shall be used as a standard of bidding. Equivalent "specification grade" devices as manufactured by Pass & Seymour or Leviton are acceptable. All receptacle and snap switch type devices shall be of one manufacturer.
- B. All receptacles shall be in complete compliance with the latest published NEMA configurations for the intended applications, even though not specifically indicated on the Construction Documents.
- C. Light switches: 120/277 volt, quiet type, Hubbell #1221 (single pole), #1223 (three-way) and #1224 (four-way).
- D. General Purpose Receptacles: 125 volt, 20 ampere, 2-pole, 3-wire, duplex type, NEMA 5-20R, Hubbell #5362.

- E. GFCI Receptacles: 125 volt, 20 ampere, 2-pole, 3-wire duplex type, NEMA 5-20R, with self-test feature - Hubbell #GFR-5362, feed-thru type capable of protecting downstream circuit devices.
- F. Other special purpose devices may be specified on the plans.
- G. Ivory has been selected as the standard for bidding; however, colors shall be as selected by Owner's Representative from the Manufacturer's specification grade standards for both wiring devices and cover plates.
- H. All switch and convenience outlet plates shall be high impact smooth thermoplastic (Noryl or equal) to suit the various outlets or switches installed in finished areas or for flush mounted devices. Color to match device. In unfinished areas, utilize cadmium plate round corner steel covers, with cadmium plated screws.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. The approximate locations of devices are given on the Construction Documents. The exact location shall be determined at the building as the work progresses. Coordinate with architectural features; also remain clear of all mechanical equipment.
- B. Unless otherwise indicated or otherwise decided at the site, outlet boxes in walls shall be located with center line at elevation above the finished floor as indicated in the symbol legend on the drawings. Also review the architectural elevations and outlet location plans; if dimensions are given, outlets shall be provided with box supports and bracing to allow the installation to the dimensioned locations.
- C. The Owner's Representative shall reserve the right to reasonably change the location of any outlet before it has been installed, without additional charge.
- D. Install light switches on latch side of door, within 6" horizontally of frame edge; confirm latch side of all doors with the General Trades contractor before rough-in.
- E. Where receptacles and/or switches are shown within 12" proximity of each other, they shall be installed in multi-gang outlets with suitable multi-gang device plates.
- F. Provide green grounding conductor from each receptacle grounding contact bonded to the outlet box with an approved grounding clip or ground screw connection.
- G. All plates shall suit the device installed. Sectional plates will not be permitted. All flush outlets shall be fitted with device plates that completely conceal the openings.
- H. Install receptacles and switches only in electrical boxes which are clean and free from excess building materials, debris, etc.

- I. At time of substantial completion, replace those wall plates and receptacles which have been damaged during construction.
- J. Wiring devices covered in this section shall be provided with a grounded wire connected to the device and/or the associated outlet box. Test wiring devices to ensure electrical continuity of grounding connections after energizing circuitry to demonstrate compliance with all grounding requirements.
- K. All receptacles shall be installed with the grounding pin opening in the "up" position. All single pole light switches shall be installed with the "OFF" position down.
- L. On the inside cover of each receptacle cover plate provide a permanent label to indicate the panel and circuit number that feeds the receptacle.
- M. All GFCI receptacles shall be installed in a readily accessible location, visible for testing and inspection.

END OF SECTION

## SECTION 16533 - RACEWAYS

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Provide all labor, material, equipment, tools, and services necessary for, and incidental to, the proper installation of a complete electrical raceway system herein specified, and as shown on the Construction Documents.

#### 1.2 QUALITY ASSURANCE

- A. All raceways and fittings shall conform to the requirements of the National Electrical Code (NEC), NEMA, JIC, ANSI, and shall be labeled with the Underwriters Laboratories Seal of Inspection.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from damage prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible and free from damage or deteriorating elements.
- B. In general, do not deliver items of electrical equipment to the project substantially before the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installation within 3-weeks of receipt.
- C. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage and handling.

### PART 2 PRODUCTS

#### 2.1 CONDUITS AND FITTINGS

- A. Electric Metallic Tubing (EMT) shall be zinc coated steel electrical metallic tubing.
- B. Flexible Metal Conduit shall be manufactured of heavily zinc coated sheet metal strips interlocked to form a flexible, smooth wiring channel.
- C. Conduit fittings for exposed work shall be corrosion-resistant. Fittings shall provide ample wiring space and shall have smooth round edges and full-threaded hubs.
- D. EMT fittings, connectors and couplings shall be threadless gland setscrew tightened type with insulated throat.

## 2.2 BOXES

- A. Unless otherwise noted, all concealed outlets shall be galvanized or sheradized pressed steel outlet boxes to accommodate device indicated by symbol, considering also code requirements, number and size of conductors and splices, and consistent with type of construction.
- B. All junction, pull and outlet boxes shall be UL listed and suitable for the installation. In general, outlet boxes for wall receptacles, wall switches and communications outlets shall be single gang 2-1/8" deep minimum.
- C. Outlet boxes installed at lighting fixtures shall be 4" octagon, 2-1/8" deep minimum.
- D. The Construction Documents may indicate junction box location and sizes for selected equipment. Additional locations and quantities of boxes is left to the judgment of the Contractor to produce the most satisfactory installation at least cost.
- E. Pull boxes and junction boxes for lighting, power, and control systems larger than 6" x 6" x 4" shall be constructed of galvanized hot-rolled sheet steel. Sizes of the boxes shall be as noted or determined by the Contractor in the field, based on a minimum full circle loop bends of conductors as recommended by the wire manufacturer, plus the convenience of making clean wire splices and connections.
- F. All pull boxes and junction boxes shall be accessible and shall be fitted with a full side and/or bottom removable cover plate, securely and tightly held in place with machine screws in properly drilled and tapped holes and shall be equipped with dust-tight gaskets.
- G. Conduit supports for horizontal or vertical single conduit runs shall be hot dipped galvanized heavy duty steel straps, mineralac clamps or channel system with appropriate components. Spring type pressure clamps may be used with conduits through 3/4".

## 2.3 THROUGH-FLOOR FITTINGS

- A. Where through-floor fittings are shown for power and/or communications outlets, the Contractor shall provide devices as listed or scheduled on the drawings, and include all hardware and accessories for a complete installation.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. All conduit shall be concealed in walls, floors and ceilings in areas of "finished" construction. Exposed conduit in finished areas will not be permitted. Exposed conduit will be permitted in mechanical equipment areas, in exposed structure

areas for motor feeders and equipment, but not in other areas without the specific approval of the Owner's Representative.

- B. Exposed conduits, where permitted, shall be run at right angles and parallel to the building structural members and shall avoid proximity of hot water pipes. Conduits shall be run as high as possible, "tight" to building structural members so as to permit installation of other utilities and systems. Conduits in floor slabs containing heat piping shall be avoided where possible, and where required, shall be separated as far as possible to limit the heat transmission. All vertical runs shall be plumb.
- C. Conduit installation in exterior walls shall be kept at a minimum and shall be so placed only where absolutely necessary. Horizontal conduit runs in masonry walls are not acceptable. Under no conditions shall conduit be installed exposed on top of floors.
- D. Thin wall conduit (EMT) shall not be used where conduits are laid in concrete slabs, in exterior masonry walls, in damp locations, outside the building, underground, exposed, or in hazardous areas. EMT conduit is approved for installation in other applications as outlined in the National Electrical Code.
- E. All conduit shall be of the proper standard electrical trade size in accordance with the National Electrical Code and shall be so installed that the required number of conductors may be pulled in without exceeding the manufacturer's recommended pulling tensions. Conduits shall be not less than 3/4" electrical trade size for any purpose whatsoever, nor less than size as specified or noted on the Construction Documents.
- F. Conduits installed in floor slabs shall have minimum 1-1/2" concrete cover. Branch circuit conduits installed in or under concrete slab may be schedule 40 PVC with ground wire.
- G. Coupling and threaded hubs for rigid steel conduit shall have no less than five threads of conduit engaged and shall be screwed tight, fully engaged. Long threads known as "running threads" shall not be used, and only manufactured close or short nipples will be permitted.
- H. A properly sized bender shall be used for conduit bends. Conduits larger than 1" shall have bends made with a power bender. Conduit runs between outlets shall not contain more than the equivalent of four 90-degree bends. If more than four 90-degree bends are required on any conduit run, a pullbox, junction box or conduit fitting shall be installed.
- I. All conduit ends shall be reamed after cutting is made and all conduits shall have two (2) locknuts, and bushing at outlet boxes, cabinets, junction boxes, etc., except those terminating at threaded hubs. All bushings larger than one inch shall be insulated bushings, shallow type.
- J. All conduits terminating in junction boxes, outlets, or equipment, and all conduit stubs shall be fitted with threaded blanked bushings, to prevent the entry of

foreign materials, rain, or excessive moisture during the building rough-in prior to installation of wiring. Paper, rags, or corks shall not be used for plugs.

- K. Conduit runs in general shall be supported on trapeze hangers and for horizontal runs shall be supported with 1-hole malleable clamps and screws for conduits fastened below horizontal supporting steel, or fastened on vertical supporting steel. Bailing wire or perforated strap material shall not be used for supporting or securing conduits. Do not attach work to metal roof decks or Tectum ceiling, if any occur in the building construction. Supports must be able to carry at least twice the actual load. Joint use of hangers with heating and plumbing lines will not be permitted and conduit shall be installed above piping wherever possible.
- L. Suspended ceiling systems, including the associated support wires, shall not be used for conduit support. Conduits shall not interfere with ceiling tile installation or removal and shall not rest on or be attached to the T-bars of the system.
- M. The Contractor shall provide all pipe hangers, brackets, straps, clamps and supports required to adequately support conduits. Exposed conduits 1-1/2" and under shall be supported on five-foot centers or less. Suitable metal spacers shall be provided to maintain a minimum of 1/2" clearance from walls and ceilings for all conduits run exposed. The spacers and all other supporting hardware shall be cadmium plated clamps, bracket bolts or lead expansive screws anchors, or other similarly approved method. Wood plugs will not be permitted.
- N. Contractor shall furnish and install all pull boxes, junction boxes, splice boxes and fittings wherever necessary or shown on Construction Documents. All boxes shall be made of code gauge steel with screw covers. All straight conduit runs shall not exceed 100 feet without pull box or 'C' fitting, nor over 75 feet for run with one right angle bend, and not over 50 feet for run with two right angle bends. The location of all pull boxes will be subject to the approval of the Owner's Representative.
- O. If PVC conduit is used below the ground floor slab, exposed conduits rising from floor to surface panels and/or boxes shall be rigid steel or IMC to the equipment or box enclosure.
- P. Conduit sleeves are to be completely packed with appropriate fire proofing material and concrete, and all firewalls penetrated by conduit shall maintain the Fire Rating of the penetrated areas. Provide conduit insulating bushings with ground lugs on all conduits terminating in or under distribution panels, unit substations, etc., and ground to the components system ground. Insulating bushings shall be provided at all other locations as required by the National Electrical Code.
- Q. Conduits or other raceway systems that penetrate through fire rated walls, ceilings, decks, smoke partitions, etc., shall be installed so as to maintain the integrity of the fire or smoke rated area.
- R. Flexible metal conduits may be used within a ceiling space from junction boxes to recessed fixtures. Wherever flexible metal conduits are permitted, an equipment grounding wire shall be installed to maintain continuity through the flexible portion

of the conduit to each termination point. Flexible conduits installed in the ceiling space shall not exceed 6-feet in length.

- S. Conductors installed in vertical raceways shall be adequately supported with approved conductor supports at the intervals stipulated by the National Electrical Code. Conductors shall be supported at points of termination independent of panel lugs.

END OF SECTION

## SECTION 16534 – PATHWAYS FOR COMMUNICATIONS SYSTEMS

### PART 1 GENERAL

#### 1.1 DESCRIPTION

- A. Section 16010, General Requirements, apply to this section.
- B. Provide all labor, material, equipment, tools, and services necessary for, and incidental to, the proper installation of the raceway and outlet box system herein specified, and as shown on the Construction Documents.
- C. All communication system wiring and electronic communications equipment will be provided by the Owner's Vendor. Raceway and outlet boxes are required for the following communications systems:
  - 1. Voice / Data Communications

#### 1.2 QUALITY ASSURANCE

- A. All raceways, installations and fittings shall conform to the requirements of the National Electrical Code (NEC), NEMA, JIC, ANSI, and shall be labeled with the Underwriters Laboratories Seal of Inspection.

#### 1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Materials shall be stored to protect them from injury prior to installation. Material should not be stored directly on the ground or floor and shall be kept as clean and dry as possible and free from damage or deteriorating elements.
- B. In general, do not deliver items of electrical equipment to the project substantially before the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installation within three weeks of receipt.
- C. Deliver products to project properly identified with names, types, grades, compliance labels and similar information needed for distinct identification. Materials must be adequately packaged or protected to prevent deterioration during shipment, storage and handling.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. The raceway systems shall be as hereinbefore specified under Section 16533.
- B. Unless otherwise shown on the Drawings, the minimum conduit is 3/4" trade size for voice / data communication. A one gang or two gang outlet box shall be installed for every communications device indicated on the Construction Documents.

- C. The required conduit and box sizes are indicated on the Construction Documents, along with mounting heights, through-wall sleeves and other raceways. However the Owner or Owner's vendor shall determine the exact conduit and box system requirements; this Contractor is required to coordinate with and obtain approval from the Owner's representative before rough-in of any conduit or outlet box.
- D. In general, all raceways for the telephone, communications and computer systems shall be concealed in walls floors or ceiling spaces. Exposed work will be permitted only where specifically directed by the Owner and as shown on the Construction Documents.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Provide conduit complete with #12 pullwire from each outlet stubbed-up into nearest accessible ceiling space.
- B. Provide plastic bushings on conduits stubbed above ceiling.
- C. All work shall be as directed by, under the supervision of, and in strict compliance with the requirements of the Owner's system vendor.

END OF SECTION

VIII

**NON-COLLUSION AFFIDAVIT**

STATE OF OHIO,

COUNTY OF LAKE, SS:

\_\_\_\_\_ being first duly  
SWORN, deposes and says that he is the \_\_\_\_\_ or  
authorized representative of \_\_\_\_\_ or is  
the party submitting this bid: that such bid is genuine and not collusive  
or sham; that said bidder has not colluded, conspired, connived, or  
agreed, directly or indirectly, with any other bidder or person, to submit  
a sham bid, or refrain from bidding; has not in any manner, directly or  
indirectly sought by agreement or collusion, or communication or  
conference, with any person, to fix the bid price, or of that of any other  
bidder; to secure any advantage against the County of Lake or any  
person or persons interested in the proposed contract; that all  
statements contained in said proposal of bid are true, and that, such  
bidder has not, directly or indirectly submitted this bid, or the contents  
thereof, or divulged information or data relative thereto to any other  
potential bidder. Further, Affiant affirms that no county employee has  
any financial interest in this company or the bid being submitted.

\_\_\_\_\_  
Affiant & Title

SWORN to before me and subscribed in my presence this \_\_\_\_ day of  
\_\_\_\_\_, 20\_\_\_\_.

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

(seal)

My commission expires

\_\_\_\_\_, 20\_\_\_\_

**IX**

**NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY  
AFFIDAVIT**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_SS

\_\_\_\_\_ being first duly sworn, deposes  
and says that he is \_\_\_\_\_ of

\_\_\_\_\_ the party who made the foregoing proposal; that such party as bidder does not and shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. If awarded the bid and contract under this proposal, said party shall take affirmative action to insure that applicants, without regard to their race, religion, color, sex or national origin. If successful as the lowest and best bidder under the foregoing proposal, this party shall post nondiscrimination notices in conspicuous places available to employees and applicants for employment setting forth the provisions of this affidavit.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Affiant

\_\_\_\_\_  
Company/Corporation

\_\_\_\_\_  
Address

\_\_\_\_\_  
City/State/Zip Code

Sworn to and subscribed before me this \_\_\_\_ day of \_\_\_\_\_,  
20\_\_.

(seal)

\_\_\_\_\_  
Notary



## Prevailing Wage Determination Cover Letter

**County:**

**Determination Date:** 07/08/2015

**Expiration Date:** 10/08/2015

THE FOLLOWING PAGES ARE PREVAILING RATES OF WAGES ON PUBLIC IMPROVEMENTS FAIRLY ESTIMATED TO BE MORE THAN THE AMOUNT IN O.R.C. SEC. 4115.03 (b) (1) or (2), AS APPLICABLE.

Section 4115.05 provides, in part: "Where contracts are not awarded or construction undertaken within ninety days from the date of the establishment of the prevailing wages, there shall be a redetermination of the prevailing rate of wages before the contract is awarded." The expiration date of this wage schedule is listed above for your convenience only. This wage determination is not intended as a blanket determination to be used for all projects during this period without prior approval of this Department.

Section 4115.04, Ohio Revised Code provides, in part: "Such schedule of wages shall be attached to and made a part of the specifications for the work, and shall be printed on the bidding blanks where the work is done by contract..."

The contract between the letting authority and the successful bidder shall contain a statement requiring that mechanics and laborers be paid a prevailing rate of wage as required in Section 4115.06, Ohio Revised Code.

The contractor or subcontractor is required to file with the contracting public authority upon completion of the project and prior to final payment therefore an affidavit stating that he has fully complied with Chapter 4115 of the Ohio Revised Code.

The wage rates contained in this schedule are the "Prevailing Wages" as defined by Section 4115.03, Ohio Revised Code (the basic hourly rates plus certain fringe benefits). These rates and fringes shall be a minimum to be paid under a contract regulated by Chapter 4115 of the Ohio Revised Code by contractors and subcontractors. The prevailing wage rates contained in this schedule include the effective dates and wage rates currently on file. In cases where future effective dates are not included in this schedule, modifications to the wage schedule will be furnished to the Prevailing Wage Coordinator appointed by the public authority as soon as prevailing wage rates increases are received by this office.

"There shall be posted in a prominent and accessible place on the site of work a legible statement of the Schedule of Wage Rates specified in the contract to the various classifications of laborers, workmen, and mechanics employed, said statement to remain posted during the life of such contract." Section 4115.07, Ohio Revised Code.

Apprentices will be permitted to work only under a bona fide apprenticeship program if such program exists and if such program is registered with the Ohio Apprenticeship Council.

Section 4115.071 provides that no later than ten days before the first payment of wages is due to any employee of any contractor or subcontractor working on a contract regulated by Chapter 4115, Ohio Revised Code, the contracting public authority shall appoint one of his own employees to act as the prevailing wage coordinator for said contract. The duties of the prevailing wage coordinator are outlined in Section 4115.071 of the Ohio Revised Code.

Section 4115.05 provides for an escalator in the prevailing wage rate. Each time a new rate is established, that rate is required to be paid on all ongoing public improvement projects.

A further requirement of Section 4115.05 of the Ohio Revised Code is: "On the occasion of the first pay date under a contract, the contractor shall furnish each employee not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of Labor with individual written notification of the job classification to which the employee is assigned, the prevailing wage determined to be applicable to that classification, separated into the hourly rate of pay and the fringe payments, and the identity of the prevailing wage Coordinator appointed by the public authority. The contractor or subcontractor shall furnish the same notification to each affected employee every time the job classification of the employee is changed."

Work performed in connection with the installation of modular furniture may be subject to prevailing wage.

**THIS PACKET IS NOT TO BE SEPARATED BUT IS TO REMAIN COMPLETE AS IT IS SUBMITTED TO YOU.  
(Reference guidelines and forms are included in this packet to be helpful in the compliance of the Prevailing Wage law.)**

wh1500



3 Journeymen to 1 Apprentice

ASHLAND, ASHTABULA, CUYAHOGA,  
ERIE, GEAUGA, HURON, LAKE, LORAIN,  
MEDINA, PORTAGE, RICHLAND, SUMMIT

### **Special Jurisdictional Note :**

#### **Details :**

If certain projects warrant a larger percentage of apprentices, it will be agreed to increase the ratio of apprentices to journeymen, but Not to exceed (1) Apprentice to (4) Journeymen.

The term "Millwright and Machine Erectors" jurisdiction shall mean the unloading, hoisting, rigging, skidding, moving, dismantling, aligning, erecting, assembling, repairing, maintenance and adjusting of all structures, processing areas either under cover, under ground or elsewhere, required to process material, handle, manufacture or service, be it powered or receiving power manually, by steam, gas, electricity, gasoline, diesel, nuclear, solar, water, air or chemically, and in industries such as and including, which are identified for the purpose of description, but not limited to, the following: woodworking plants; canning industries; steel mills; coffee roasting plants; paper and pulp; cellophane; stone crushing; gravel and sand washing and handling; refineries; grain storage and handling; asphalt plants; sewage disposal; water plants; laundries; bakeries; mixing plants; can, bottle and bag packing plants; textile mills; paint mills; breweries; milk processing plants; power plants; aluminum processing or manufacturing plants; and amusement and entertainment fields. The installation of mechanical equipment in atomic energy plants; installation of reactors in power plants; installation of control rods and equipment in reactors; and installation of mechanical equipment in rocket missile bases, launchers, launching gantry, floating bases, hydraulic escape doors and any and all component parts thereto, either assembled, semi-assembled or disassembled. The installation of, but not limited to, the following: setting-up of all engines, motors, generators, air compressors, fans, pumps, scales, hoppers, conveyors of all types, sizes and their supports; escalators; man lifts; moving sidewalks; hoists; dumb waiters; all types of feeding machinery; amusement devices; mechanical pin setters and spotters in bowling alleys; refrigeration equipment; and the installation of all types of equipment necessary and required to process material either in the manufacturing or servicing. The handling and installation of pulleys, gears, sheaves, fly wheels, air and vacuum drives, worm drives and gear drives directly or indirectly coupled to motors, belts, chains, screws, legs, boots, guards, booth tanks, all bin valves, turn heads and indicators, shafting, bearings, cable sprockets, cutting all key seats in new and old work, troughs, chippers, filters, calendars, rolls, winders, rewinders, slitters, cutters, wrapping machines, blowers, forging machines, rams, hydraulic or otherwise, planing, extruder, ball, dust collectors, equipment in meat packing plants, splicing of ropes and cables. The laying-out, fabrication and installation of protection equipment including machinery guards, making and setting of templates for machinery, fabrication of bolts, nuts, pans, drilling of holes for any equipment which the Millwrights install regardless of materials; all welding and burning regardless of type, fabrication of all lines, hose or tubing used in lubricating machinery installed by Millwrights; grinding, cleaning, servicing and any machine work necessary for any part of any equipment installed by the Millwrights; and the break-in and trial run of any equipment or machinery installed by the Millwrights. It is agreed the Millwrights shall use the layout tools and optic equipment necessary to perform their work.





**Jurisdiction ( \* denotes special jurisdictional note ) :**

4 Journeymen to 1 Apprentice on Structural Work	ASHTABULA, CUYAHOGA, ERIE, GEAUGA,
3 Journeymen to 1 Apprentice on Rod Work	HURON, LAKE, LORAIN, MEDINA,
2 Journeymen to 1 Apprentice on ALL Finishing, Steel Sash, Stairway and Ornamental Work	PORTAGE, SUMMIT

**Special Jurisdictional Note :** West Boundary Line :Sandusky, Ohio: Boundary lines between Local 17 & Local 55 are as follows: Columbus Ave north to Sandusky Bay (and/or Lake Erie): Columbus Ave South to present Route 4: Route 4 South to present Route 99: from Route 99 south to old Route 224-all territory to the west of the boundary line to be the jurisdiction of Local 55.All territory to the East of the boundary line to be the jurisdiction of Local 17.Kelly's Island to be within jurisdiction of Local 17.All bridges,tunnels,viaducts,etc, relative to these boundary lines shall be the jurisdiction of Local 17

South Boundary Line:Canton, Ohio: Boundary lines between Local 17 & Local 550 are as follows: All territory north of old Route 224 line to be the jurisdiction of Local 17. All bridges,tunnels,viaducts,signs,etc, relative to old Route 224 line to be within the jurisdiction of Local 17. All territory south of old Route 224 line is to be within the jurisdiction of Local 550, except for everything within the city limits of Barberton which shall be the jurisdiction of Local 17.

Reading from West to East: Route old 224 line: Greenwich Ave-Wooster Road or East Ave. Route old 224 line: New 224 line including Cloverleaf: East Waterloo Road: New 224 line-Attwood Road-Old 224. This will be considered to be the old Route 224 line,except for the city limits of Barberton, Ohio which shall be the jurisdiction of Local 17

Southeast Boundary : Between local 17 and Local 207 are as follows: West of a line from Middlefield to Shalersville to Deerfield, shall be under the jurisdiction of local 17. East of a line from Middlefield, to Shalersville to Deerfield, shall be under the jurisdiction of Local 207. Local 17 & Local 207 have agreed that the Ohio County of Ashtabula shall be as follows: Everything North of Route 6, starting at the Geauga County line, proceeding east to State Route 45, shall be under the jurisdiction of Local 17. Everything South, starting at the Geauga County line shall be under local 207.

North Boundary: The East boundary line and the West boundary line continuing North halfway across Lake Erie.

**Details :**



**Details :**

## Group 1

Laborer (Construction); Plant Laborer or Yardman, Right-of-way Laborer, Landscape Laborer, Highway Lighting Worker, Signalization Worker, (Swimming) Pool Construction Laborer, Utility Man, Bridge Man, Handyman, Joint Setter, Flagperson, Carpenter Helper, Waterproofing Laborer, Slurry Seal, Seal Coating, Surface Treatment or Road Mix Laborer, Riprap Laborer & Grouter, Asphalt Laborer, Dump Man (batch trucks), Guardrail & Fence Installer, Mesh Handler & Placer, Concrete Curing Applicator, Scaffold Erector, Sign Installer, Hazardous Waste (level D), Diver Helper, Zone Person and Traffic Control.

## Group 2

Asphalt Raker, Screwman or Paver, Concrete Puddler, Kettle Man (pipeline), All Machine-Driven Tools (Gas, Electric, Air), Mason Tender, Brick Paver, Mortar Mixer, Skid Steer, Sheeting & Shoring Person, Surface Grinder Person, Screedperson, Water Blast, Hand Held Wand, Power Buggy or Power Wheelbarrow, Paint Striper, Plastic fusing Machine Operator, Rodding Machine Operator, Pug Mill Operator, Operator of All Vacuum Devices Wet or Dry, Handling of all Pumps 4 inches and under (gas, air or electric), Bottom Person, Welder Helper (pipeline), Concrete Saw Person, Cutting with Burning Torch, Pipe Layer, Hand Spiker (railroad), Underground Person (working in sewer and waterline, cleaning, repairing and reconditioning). Tunnel Laborer (without air), Caisson, Cofferdam (below 25 feet deep), Air Track and Wagon Drill, Sandblaster Nozzle Person, Hazardous Waste (level B), Lead Abatement, Hazardous Waste (level C)

## Group 3

Blast and Powder Person, Muckers (with miners), Wrencher (mechanical joints & utility pipeline), Yarner, Top Lander, Hazardous Waste (level A), Concrete Specialist, Curb Setter and Cutter, Concrete Crew in Tunnels. Utility pipeline Tappers, Waterline, Caulker, Signal Person, Grade Checker

## Group 4

Miner, Welder, Guniting Nozzle Person

# Prevailing Wage Rate Skilled Crafts

Name of Union: Labor Local 310

Change # : LCN01-2014fbLabor310

Craft : Laborer Effective Date : 08/14/2014 Last Posted : 08/14/2014

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate	
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)			MISC (*)
Classification												
Laborer Group 1	\$24.69		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$41.81	\$54.16
Group 2	\$25.17		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$42.29	\$54.88
Group 3	\$24.94		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$42.06	\$54.53
Group 4	\$21.59		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$38.71	\$49.51
Group 5	\$19.09		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$36.21	\$45.76
Group 6	\$21.24		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$38.36	\$48.98
Group 7	\$25.19		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$42.31	\$54.91
Group 8	\$25.34		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$42.46	\$55.13
Group 9	\$19.54		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$36.66	\$46.43
Group 10	\$15.54		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$32.66	\$40.43
Group 11	\$24.84		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$41.96	\$54.38
Group 12	\$25.08		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$42.20	\$54.74
Group 13	\$26.19		\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$43.31	\$56.41
<hr/>												
Apprentice	Percent											
1-1000 hours	60.00	\$14.81	\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$31.93	\$39.34
1001-2000 hours	70.00	\$17.28	\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$34.40	\$43.04
2001-3000 hours	80.00	\$19.75	\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$36.87	\$46.75
3001-4000 hours	90.00	\$22.22	\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$39.34	\$50.45
4001 plus	100.00	\$24.69	\$4.77	\$9.20	\$0.10	\$0.00	\$2.60	\$0.45	\$0.00	\$0.00	\$41.81	\$54.16

Special Calculation Note : Other is a Supplemental Unemployment Benefit (SUB).

Ratio : Jurisdiction ( \* denotes special jurisdictional note ) :  
CUYAHOGA, GEAUGA, LAKE

1 Journeymen to 1 Apprentice  
4 Journeymen to 1 Apprentice

**Special Jurisdictional Note :**

**Details :**

Group 1 - Building and construction Laborers and Tenders; Asbestos Removal - hazardous materials; unloading of furniture and fixtures.

Group 2 - Gunite Operating (Machines of all type).

Group 3 - Laborers on swinging scaffolds; air track and wagon drill.

Group 4 - Drywall stocking and handling.

Group 5 - General Landscaping.

Group 6 - Final Clean-up (must perform clean-up duties for entire work shift, and excludes demolition work).

Group 7 - Blasters, Shooters, Caissons, Well Cylinder, Cofferdams, Mine Workers without air, acid brick tenders.

Group 8 - Top man on free standing radial stack; bellman and bottom man in blast furnace and stove.

Group 9 - Sewer jet.

Group 10 - Heat tender.

Group 11 - Firebrick.

Group 12 - Mason tender handling carbon block and bottom block for blast furnace stoves, stacks etc.

Group 13 - Lansing Burners.

# Prevailing Wage Rate Skilled Crafts

Name of Union: Plumber Local 55

Change # : LCN0-2015fbLoc55Plum

Craft : Plumber Effective Date : 06/03/2015 Last Posted : 06/03/2015

	BHR		Fringe Benefit Payments					Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)		
Classification											
Plumber	\$34.90	\$9.50	\$10.05	\$1.18	\$0.00	\$0.50	\$0.55	\$0.00	\$0.00	\$56.68	\$74.13
Yard Piping	\$23.41	\$6.88	\$1.95	\$0.64	\$0.00	\$0.50	\$0.55	\$0.00	\$0.00	\$33.93	\$45.64
Shopman	\$19.24	\$7.30	\$5.63	\$0.10	\$0.00	\$0.50	\$0.00	\$0.00	\$0.00	\$32.77	\$42.39
Apprentice Initiated BEFORE 5/1/10											
4th year	\$25.18	\$6.50	\$2.86	\$1.05	\$0.00	\$0.50	\$0.55	\$0.00	\$0.00	\$36.64	\$49.23
5th year	\$27.67	\$6.83	\$2.86	\$1.10	\$0.00	\$0.50	\$0.55	\$0.00	\$0.00	\$39.51	\$53.35
Apprentice Initiated AFTER 5/1/10	Percent										
1-6 Months	37.05	\$12.93	\$5.71	\$0.00	\$0.90	\$0.00	\$0.00	\$0.00	\$0.00	\$19.54	\$26.01
7-12 Months	42.98	\$15.00	\$5.76	\$0.16	\$0.95	\$0.00	\$0.00	\$0.55	\$0.00	\$22.42	\$29.92
2nd year	44.33	\$15.47	\$6.36	\$1.91	\$1.00	\$0.00	\$0.00	\$0.55	\$0.00	\$25.29	\$33.03
3rd year	49.75	\$17.36	\$6.36	\$2.76	\$1.00	\$0.00	\$0.00	\$0.55	\$0.00	\$28.03	\$36.71
4th year	56.36	\$19.67	\$6.41	\$2.76	\$1.00	\$0.00	\$0.50	\$0.55	\$0.00	\$30.89	\$40.72
5th year	63.46	\$22.15	\$6.78	\$2.76	\$1.00	\$0.00	\$0.50	\$0.55	\$0.00	\$33.74	\$44.81
Shopman After 5/1/10	34.75	\$12.13	\$6.17	\$1.80	\$0.10	\$0.00	\$0.50	\$0.00	\$0.00	\$20.70	\$26.76

**Special Calculation Note : OTHER IS: SUPPLEMENTAL UNEMPLOYMENT**

Ratio :

Jurisdiction ( \* denotes special jurisdictional note ) :

1 Apprentice for the first steadily employed ASHTABULA, CUYAHOGA, GEAUGA, LAKE,  
journeyman, and thereafter 1 Apprentice for every MEDINA\*, SUMMIT\*  
2 steadily employed journeymen

**Special Jurisdictional Note :** Summit County - North of State Route 303 including work within the corporate limits of the City of Hudson, that portion of Medina County North of Route 18 and Smith Road and the corporate limits of the City of Medina.

**Details :**

The Plumber Shopman will have charge of the Employer's shop and warehouse containing plumbing and heating supplies and equipment, and perform such duties as are customarily required by a Plumber or a Plumber's Shopman, including casual delivery of tools and equipment necessary for installation of Plumbing and Heating facilities.