



STATE OF MICHIGAN

DEPARTMENT OF MILITARY & VETERANS AFFAIRS
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

MAJ GEN THOMAS G. CUTLER
ADJUTANT GENERAL AND DIRECTOR

April 5, 2010

SUBJECT: Armory Modifications
Augusta, MI

TO PROSPECTIVE BIDDER:

Enclosed are one complete set of bidding documents and two additional copies of the proposal form.

If you desire to bid for this work, please submit your proposal, in duplicate, to the Department of Management and Budget, Office of Design and Construction, Facilities Administration, Second Floor, Stevens T. Mason Building, 530 W. Allegan, P. O. Box 30026, Lansing, Michigan 48909. Your proposal must be received on or before the bid opening date and time stated on the proposal form, when all bids will be publicly opened and read aloud.

Your bid should be returned in the self-addressed envelope which is enclosed for your convenience. Before sealing the envelope, check to be sure that:

1. The Proposal form is signed and the Base Proposal Sum amount filled in.
2. Alternates and unit prices are filled in (if required).
3. Bid security is included (if required).
4. All addendums received are acknowledged.
5. Certificate of Awardability or compliance is enclosed (if required).

On the outside of the envelope, identify:

1. The project by name, index code number and location.
2. The Bidder's name and complete address.

If you wish to revise your bid proposal after it has been mailed to Department of Management and Budget, you may submit your revision by fax to (517) 373-3562, ATTN: Linda Feldpausch. The fax must be on your letterhead, signed by the person who signed the original bid proposal. Do not include the original bid amount. Specify only the amount to either increase or decrease your bid.

Bidding procedures and additional copies of the bidding documents are available upon request by contacting Carrie Morey at (517) 481-7562. General Design questions should be directed to Ben Kopietz (517) 481-7552. All site questions should be directed to Gary Strickland (517) 481-7546.

Sincerely,

Sheila S. Triplett, CW4
Administrative Services/Contracting
Construction & Facilities Management Office

PROPOSAL AND CONTRACT

SUBMIT PROPOSAL TO:

DEPARTMENT OF MANAGEMENT AND BUDGET
 Facilities Administration
 Design and Construction Division
 2nd Floor, Stevens T. Mason Building
 P.O. Box 30026, Lansing, Michigan 48909
 530 W. Allegan, Lansing, Michigan 48933

EXPRESS MAIL TO:

THIS FORM IS REQUIRED FOR SUBMISSION OF A VALID PROPOSAL TO PROVIDE THE SERVICES AS SPECIFIED. AUTHORITY: 1984 PA 431.

INDEX NUMBER 13998	PCA CODE	AGENCY CODE	COMMODITY CODE	AGENCY NUMBER 078	FILE NUMBER 511/10143.AGY

DEPARTMENT/AGENCY Dept. of Military and Veterans Affairs 3423 Martin Luther King Blvd Lansing, MI 48906	PROJECT NAME Augusta Armory – Modifications Augusta, MI
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BID OPENING DATE April 21, 2010 2:00 PM Local Time	FOR EXAMINATION OF PREMISES AND WORKING CONDITIONS CONTACT AT THE SITE: Gary Strickland 517-481-7546
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BIDDERS: SEE INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS.

PROPOSAL: WE PROPOSE TO FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND SERVICES REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE SPECIFICATIONS AND CONDITIONS CONTAINED HEREIN IN CONSIDERATION OF THE SUM(S) STATED BELOW AND AGREE THAT THIS DOCUMENT WILL CONSTITUTE THE CONTRACT IF ACCEPTED BY THE STATE.

FIRM NAME AND COMPLETE ADDRESS	TELEPHONE NUMBER
	FEDERAL I.D. NUMBER (IF NONE, SOCIAL SECURITY NUMBER)*
BIDDER'S SIGNATURE AND TITLE	WITNESS' SIGNATURE
DATE	DATE

ACCEPTANCE: THIS PROPOSAL IS ACCEPTED BY THE STATE OF MICHIGAN

DIRECTOR, DEPARTMENT OF MANAGEMENT AND BUDGET	WITNESS' SIGNATURE
DATE	DATE

*Protected information required for processing payments.

BASE PROPOSAL SUM:.....\$_____

BIO GUARANTEE REQUIRED:

Each proposal submitted for this work must be accompanied by a bid guarantee as specified in INSTRUCTIONS TO BIDDERS. Bidders are also cautioned to familiarize themselves with all of the other conditions of the contract as set forth throughout the GENERAL CONDITIONS preface.

SCOPE OF WORK:

Work under this contract includes Constructing steel stud walls, installing hollow metal doors in hollow metal frames indicated, steel caging, lay-in ceilings, electrical, lighting, data and painting, including all related work, at Augusta Armory, 3100 26th St., Augusta, MI, in accordance with these specifications and the accompanying drawing, Project No. AU100013.

TIME OF COMPLETION:

Upon acceptance by the State of the Proposal and Contract, the above Contractor agrees to complete all Work required by Friday, 25 June 2010. See INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

1. **Preparation of Bid:** Execute bid fully and properly. Submit in duplicate on this form in a sealed envelope to this office.
2. **Signatures:** All bids, notifications, claims, and statements must be signed as follows:
 - a. Corporation: Signature of official shall be accompanied by a certified copy of the resolution of the Board of Directors authorizing the individual signing to bind the corporation.
 - b. Partnerships: Signature of one partner shall be accompanied by a certified copy of the power of attorney authorizing the individual signing to bind all partners. If bid is signed by all partners, no authorization is required.
 - c. Individual: No authorization is needed. Each signature must be witnessed.
3. **BID GUARANTEE** - Each proposal shall be accompanied by certified or cashier's check on an open, solvent bank or a bid bond with an authorized surety company (Surety must be listed on current U.S. Department of Treasury Circular 570) in the amount of 5 percent of the base bid payable to the State of Michigan, as a guarantee of good faith. If the successful bidder fails to furnish satisfactory bonds and insurance within 15 days after notice of award, such guarantee shall be forfeited to the state as liquidated damages. The guarantees of the three lowest bidders will be retained until the bonds and insurance of the contractor has been approved by the state. The guarantees of all others will be returned within ten days after the bid opening.
4. The bidder acknowledges the right of the owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, bidder recognizes the right of the owner to reject a bid;...
 - a. if the bid is in any way incomplete or irregular;
 - b. if the bidder's performance as a contractor was unsatisfactory under a prior contract for the construction, repair, modification or demolition of a facility with the owner, or a contractor in privity of contract with the owner, which was funded, directly or indirectly, by the owner.
 - c. **Equal Employment Opportunity Pre-qualifications:** All bidders submitting bids in excess of \$100,000.00 must be certified by the Department of Civil Rights for compliance with State of Michigan Equal Employment Opportunity requirements **prior to submission of bids**. A copy of the Bidder's valid certificate of compliance or awardability shall be submitted with the proposal. Failure to enclose the certificate with the proposal will not disqualify the bidder providing a valid certificate exists at the time of bid opening and the bidder submits evidence of same within 24 hours of the bid opening.
 - 1) The time required by the Department of Civil Rights to process applications varies as a function of the Departments total work load, which changes from time to time. The bidder is responsible for securing all pertinent information from the Department of Civil Rights. Communications should be directed to:

Michigan Department of Civil Rights, Office of Contractual & Business Services
Cadillac Place Building (Former General Motors Building)
3054 West Grand Blvd., Suite 3-600
Detroit, Michigan 48202
Telephone: (313) 456-3822 or 456-3823
5. It is the intent of the owner to award a contract to the lowest responsible bidder, provided it has been submitted in accordance with the requirements of the bidding documents, and does not exceed the funds available.
6. Individuals needing special services to fully participate in the bidding process due to a physical challenge may contact the building superintendent or the facility manager.
7. **Interpretation of Contract Documents:** If any person contemplating submitting a bid for this project is in doubt as to the true meaning of any part of the drawings, specifications or other contract documents, he/she may

telephone, FAX, and follow-up by written request to DMVA, Design Services Section, for an interpretation not later than nine days prior to the date of bids. The person submitting the request will be responsible for its prompt delivery. An interpretation of the documents will be made by DMVA, Design Services Section, and if an addendum is issued, it will be mailed or delivered to each person who has received a set of drawings and specifications. All addenda issued shall be made a part of the contract requirements. The State will not be responsible for any other explanation or interpretation of the contract documents.

- a. **ENGINEERING:** Bid documents were prepared, and shall be interpreted **ONLY**, by the DEPARTMENT OF MILITARY AND VETERANS AFFAIRS (DMVA), Construction and Facilities Office, Design Services Section, 3423 N. Martin Luther King Blvd, Lansing, Michigan 48906; your Design Services point-of-contact (POC) for inquiries seeking additional information or clarification shall be directed to **Ben Kopietz** to telephone **517 481-7552**.

Any interpretation or clarification, modification to the Bidding Documents (whether by correction, addition, deletion, or other revision) and/or information given will be binding only if given by written Addenda. Interpretations or clarifications, corrections, additions, deletions or other revisions or information given orally or in any other manner are not binding and shall not be relied upon by Bidders. Addenda will be sent by registered mail or private carrier or by FAX to any party who, according to records, has obtained a set of the Bidding Documents and has furnished to DMVA, Design Services Section, an address and FAX number for receiving Addenda. Addenda also may be issued to modify the Bidding Documents as may be considered advisable to the Owner.

8. **Substitution of Materials:** Any bidder wishing to use manufacturers or materials other than those specified shall submit a written request to the director not later than nine days prior to due date for bids. Request shall be accompanied by product data to permit evaluation and comparison with specified products or materials. The person submitting the request will be responsible for its prompt delivery. An examination and evaluation of product data will be made by the state unit and, if found acceptable, an addendum will be issued and mailed or delivered to each person who has received a set of drawings and specifications. All addenda issued shall be made a part of the contract requirements. Contractor will be responsible for any extra work and expense incurred to satisfactorily and completely incorporate each substitute product into the project. Also see GENERAL CONDITIONS, paragraph “**MATERIALS**”.
9. **PRE-AWARD SUBMITTALS:** Prior to award of the contract, the low bidder is required to submit a "single copy flyer" of preliminary technical data on each product listed in Section 01330 SUBMITTAL PROCEDURES. This "flyer" data is for DMVA use to confirm compliance with the contract documents prior to contract award. Contractor will furnish this information to the DEPARTMENT OF MILITARY AND VETERANS AFFAIRS, Construction & Facilities Management Office, 3423 N. Martin Luther King Blvd, Lansing, Michigan 48906, within forty-eight (48) hours after notification of award eligibility by the DMVA. Failure to supply this preliminary data to demonstrate compliance with intent of the contract documents will be considered a material breach and will result in rejection of the bid and award to the next responsible low bidder.
9. **TIME OF COMPLETION:** Work of all trades as specified in the contract documents shall be completed by the end of the working day **Friday, 25th June 2010**, except for minor replacement, correction, or adjustment items which do not interfere with the complete operation and utilization of all parts of the contract work. If, at any time during the life of this contract, the Contractor finds that for reasons beyond his control (except weather) it will be impossible to complete the work on or before the completion date fixed by the contract, a written request for a change to the contract extending the time of completion shall be submitted. Such a request shall set forth in precise detail the reasons believed to justify an extension and shall be in such format as the State may require. When submitting a quotation for a contract change authorization for extra work or change in plans, the Contractor shall include as part of the quotation, a statement requesting any extra time necessary to complete the related work. Lack of such a statement will serve as notification that extra time will not be

required to complete the contract and will waive the right to later claim therefore. No additional compensation shall become due the Contractor solely as a result of factors relating to performing contract work during any extension period granted.

10. **Michigan and Recycled Products:** The Bidder awarded the Contract and all Subcontractors and Suppliers shall use (a) Michigan-made products whenever possible where price, quality and performance are equal to or better than non-Michigan products, and (b) supplies, materials and equipment made from recycled materials if there is a readily identifiable source or market as determined by the Director and the cost does not exceed one hundred ten percent (110%) of supplies, materials or equipment not containing recycled materials (Sections 261 and 261a of the Management and Budget Act, 1984 PA 431, as amended MCL 18.1261 and MCL 18.1261a).
11. **Rejection or Withdrawal:** The state reserves the right to reject any bids and to waive any defects in bids. Bids may not be withdrawn **within 60 days** after opening date without forfeiting bid security.
12. **Contract:** Upon acceptance by the state, this document will constitute the contract and the executed duplicate will be returned to the contractor. The contract shall not be in force until the contractor has complied with all of the requirements of insurance.

GENERAL CONDITIONS

1. **Glossary: (Also see Section REFERENCES)**

"**State**", the State of Michigan in its governmental capacity, including any agency, department, unit or other instrumentality of the State.

"**Director**", the Director of the Department of Management and Budget, State of Michigan.

"**State Unit**", any agency, department, unit or other instrumentality of the State.

"**Contractor**", bidder whose proposal is accepted by the State, is named "the Contractor" in the Agreement with whom the Owner has entered into an Agreement covering the Work to be furnished and performed.

"**Notice of Award**", The written notice recommending the award of the Contract to the Bidder recommended for award and stating that the Owner will sign the Agreement upon compliance by the Bidder recommended for award, within the time specified, with those conditions itemized in the Notice of Award.

"**Contract Documents**", Specifications, Drawing, Pre-Bid Addenda, and Change Orders.

"**Addenda**", Written instruments used by the Owner to incorporate interpretations or clarifications, modifications (corrections, additions, deletions, or other revisions) and other information into Bid Documents.

"**Bulletin**", Written description of a proposed change issued by the Owner requesting a Contractor proposal.

"**Change Authorization**", A written order issued by the Owner, whether or not signed by the Contractor, which directs no-cost changes in the Work warranting neither any adjustment in Contract Price nor any change in Contract Time.

"**Change Order**", A written order signed by the Director, which may or may not be signed by the Contractor, and that amends the Contract Documents to provide for changes in the Work, or changes in Contract Price and/or Contract Time, or both. The term "Contract Change Order" means "Change Order."

"**Hazardous Material**", Asbestos, ACBMs, PCBs, petroleum products, such construction materials as paint thinners, solvents, gasoline, oil, etc., and any other material the manufacture, use, treatment, storage, transportation or disposal of which is regulated by federal, State, or local Laws governing the protection of public health, natural resources, or the environment.

"**Record Documents**" - Drawings, Specifications, Addenda, Change Orders, Change Authorizations, Bulletins, test records, photographs, clarifications and interpretations, and all other documents recording, or annotated to show, all revisions and deviations between the as-built installation and the Contract Documents, approved Submittals and clarifications and interpretations.

"**Resident Inspector**", a State employee, making visits at intervals appropriate to the stage of construction, acting under the direction of the DMVA CFMO, providing on-site inspection of the Work **for compliance with the Contract Documents**.

2. **Unfair Labor Practice:** Public Act No 278 of 1980 prohibits the state from awarding a contract or subcontract to an employer who has been found in contempt of court by a Federal Court of Appeals, on not less than three occasions involving different violations during the preceding seven years, for failure to correct an unfair labor practice as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act 29 U.S.C 158. A

contractor for the state may not, in relation to that contract, subcontract with such an employer.

3. **Safety Regulations:** Contractor shall comply with, and shall require Subcontractors and Suppliers to comply with, all Laws governing the safety and protection of persons or property, included, but not limited to, the Michigan Occupational Safety and Health Act (1974 PA 154, as amended, MCL 408.1001 et seq.) and all rules promulgated under the Act. Contractor shall be responsible for fines and penalties imposed for any related violation(s) of federal and State health and safety requirements. The Contractor's safety representative at the site shall be the project superintendent unless otherwise designated in writing by the Contractor.
 - a. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs. Contractor shall take all necessary precautions for safety of, and shall erect and maintain all necessary safeguards and provide necessary protection to prevent damage, injury or loss to: (a) employees on the Work and other persons who may be affected by the Work, (b) all the Work, materials and equipment to be incorporated into the Work, adjacent to the site, including trees, shrubs, lawns, pavements, roadways, walks, structures, utilities and Underground Utilities not designated for removal, relocation, or replacement.
4. **Taxes:** The contractor shall include and be deemed to have included in the bid and contract price all Michigan sales and use taxes currently imposed by legislative enactment and as administered by the Michigan Department of Treasury's Revenue Division on the bid date.
5. **Nondiscrimination:** For all state contracts for goods or services in amount of \$5,000 or more, or for contracts entered into with parties employing three or more employees; in connection with the performance of work under this contract, the contractor shall comply with all published rules, regulations, directives, and orders of the Michigan Civil Rights Commission directives, and orders of the Michigan Civil Rights Commission relevant to Section 6, 1976 PA 453 as amended, which may be in effect at the time of bidding for any individual state project.
6. **Conflicts and Omissions:** The intent of the contract documents is to provide everything necessary for the proper execution of the work. In case of conflict, the work shall not proceed until a decision has been agreed upon by the parties concerned.
 - a. **The Contractor shall submit in writing a Request For Information (RFI) to the DMVA POCs in these Specifications. Any work this involves shall not be executed until the conflict or omission has been resolved. If the Contractor chooses not to utilize the RFI process and proceeds to complete the Work in question and the Work is not to intent of this Contract, Contractor will be responsible for all labor and materials to provide remedy and compliance.**
 - b. For related information, also see following paragraphs 17 and 18 and Section CONTRACT MODIFICATION PROCEDURES.
7. **Permits, Royalties, Patents, Notices, and Fees:** Contractor shall give all notices and pay all royalties, **building permits**, and fees. He/she shall defend all suits or claims for infringement of any patent rights and shall save the state harmless from loss on account thereof. He/she shall comply with all laws, ordinances, and codes applicable to any portion of the work.
 - a.
 - a. The contractor shall secure from the **Michigan Department of Labor & Economic Growth, BUREAU OF CONSTRUCTION CODES & FIRE SAFETY**, (permits information 517 241-9313) all construction permits necessary for proper execution of the work prior to starting work on the project site. All fees for securing the permits shall be paid by the contractor, including all inspection costs which may be legally assessed by the Bureau of Construction Codes in accordance with authority granted under 1980 PA 371.
 - b. All work shall be executed in accordance with the State Construction Codes except where work is specified or shown to be above such standard. The work shall be executed in conformity with the

- drawings and these specifications.
- c. It is not the responsibility of the contractor to make certain that the contract documents are in accordance with applicable laws, statutes, construction codes and regulations. If the contractor observes that any of the contract documents are at variance in any respect, the contractor shall promptly notify the DMVA, Construction & Facilities Office, in writing, and any necessary changes shall be accomplished by appropriate modification.
 - d. If the Contractor performs any work knowing it is to be contrary to the State Construction Code, the contractor shall assume full responsibility and shall bear all costs attributable thereto.
 - e. Procurement & Validation: Work on the project will not begin until a Construction Permit, a Mechanical and/or Plumbing Permit, and an Electrical Permit have been obtained and a copy of each has been received by the DEPARTMENT OF MILITARY AND VETERANS' AFFAIRS, Construction & Facilities Management Office, Technical Services Section, 3423 N. Martin Luther King Blvd., Lansing, Michigan 48906.
8. **Examination of Premises:** Bidders shall familiarize themselves with local conditions affecting the job. Bidders shall take their own measurements and be responsible for the correctness of their measurements. Bidders shall be held to have made such examinations and no allowances will be made in bidder's behalf by reason of error or omission on bidder's part. If any part of the contract work depends for proper results upon existing work or the work of another contractor, the bidder/contractor shall notify the director, before commencing work, of any defects that will affect the results. Failure to so notify will constitute bidder's/contractor's acceptance of the conditions.
9. **Working Conditions:** All work shall be done in accordance with all regulations governing the state unit wherein the work is to be performed and with minimum possible interference with the proper functioning of the activities of that state unit. Materials, tools, etc. shall be confined so as not to unduly encumber the premises. Each bidder shall be held to have visited the site and checked with the authorities on the working conditions and the methods of carrying out the work and to have included in his/her proposal all costs for meeting such working conditions; including snow removal to access site and means to provide adequate temporary heat, as required.
10. **Materials:** Unless otherwise specified, all materials shall be new and of the best grade of the representative kinds for the purpose. Also see INSTRUCTIONS TO BIDDERS paragraph "SUBSTITUTIONS".
- a. **Non-proprietary Specified Items** - Whenever material, an item of equipment, or a system is described by a performance specification, written as a proprietary product, or uses the name of a manufacturer or vendor, the term "or equal", if not inserted, shall be implied.
 - b. **Specified Item Bidding Requirement** - For items specified by manufacturer and model number, each Bidder shall bid named or specified materials and equipment only, including items added by Addenda. This requirement to not bid "or equals" or substitutes for those Specifications applies even if the Bidding Documents state that an "or equal" or substitute may be furnished or used for any such listed Item. Contract will be awarded on the basis that only named or specified materials and equipment will be used or furnished, except as otherwise provided by Addenda.
 - c. **Freight Carriers:** All freight bills for materials furnished by the contractor are to be paid by the contractor. Where materials are shipped direct to the State Unit by vendors for this contract, consignment must be plainly indicated that such materials are to the contractor. When advisable, shipment can be made to the contractor in care of the facility. Neither the State of Michigan nor the facility will honor any freight bills for any materials under this contract. Unloading and storage of materials shipped to the facility is the responsibility of the contractor. Neither the State of Michigan nor its employees or equipment will be utilized to unload materials.
11. **Employees and Superintendence:** Contractor shall enforce good order among his/her employees and shall not employ on the work any disorderly, intemperate, or unfit person or anyone not skilled in the work assigned to

him/her. Contractor or a competent person having authority to act for him/her shall be at the work at all times. He/She shall have the plans and specifications available on the site at all times.

- a. **Michigan Residency:** Pursuant to 1988 PA 504, 50 percent of the persons working on the project and employed by the prime contractor or subcontractors shall have been residents of the State of Michigan for not less than one year before beginning work.
12. **Other Contracts:** The state may let other contracts in connection with the work and the contractor shall properly connect and coordinate his/her work with the work of such other contractors. The state shall not be liable for any damages or increased costs occasioned by the failure of other contractors to execute their work as may be anticipated by these documents.
13. **Protection:** The contractor shall be responsible for the protection of government property during the period of construction and shall exercise care to prevent damage to structures, utility services, storm and sanitary drainage systems, lawns, trees, plant material, fences, walks, drives, roadways, and other improvements in and adjacent to the area of work under the contract. Provide means to maintain building temperature, as required
14. **Insurance:** No work connected with this contract shall be started until the contractor has submitted original signed certificates of insurance covering general liability and workers' compensation indicating (a) all workers are insured to protect him/her from claims for damages for personal injury or death which may arise from operations under this contract and that (b)he/she is covered by Property Damage Insurance in the amount of \$100,000 and Public Liability Insurance in the amount of \$100,000-\$300,000. All of the above insurance shall be maintained during the life of this contract. Partial payments shall not relieve the contractor from full responsibility for any damage which may result from any cause including fire or other casualty until completion of the contract and final payment. Any casualties shall not relieve the contractor from performing the contract. **The Certificate of Liability Insurance must be from Insurance Companies that have a rating of A- or better as listed by A. M. Best Company. No exceptions to this policy will be made. The State of Michigan must be named as an additional insured.**
15. **Surety Bonds: Contractor** shall furnish in acceptable form, surety bonds in the amount of 100% of the contract sum as security for the faithful **performance bond** of this contract and for the **payment bond** of all persons performing labor and furnishing materials in connection with this contract. The cost of the aforesaid bonds shall be paid by the Contractor. **The surety must be listed on the current U.S. Department of Treasury Circular 570. No exceptions to this policy will be made.**
16. **Michigan Right-to-Know Law:** All contractors must conform to the provisions of the Michigan Right-to-Know Law, 1986 PA 80, which requires employers to...
 - a. develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers and development and availability of Material Safety Data Sheets;
 - b. provide training for employees who work with these chemicals; and
 - c. develop a written hazard communications program.
17. **Changes:** Contractor shall make changes in the contracted work only as ordered in writing by the director. See Section CONTRACT MODIFICATION PROCEDURES.
 - a. **Nonconforming Work**
 1. Nonconforming Work means any work installed by the Contractor not exactly conforming to the Contract Documents.
 2. If the Owner prefers to accept Work which is not in accordance with Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable.
 3. Such adjustment shall be effected whether or not final payment has been made if such nonconforming work is not discovered until after final payment is made.

4. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.
 5. The Contractor shall promptly correct Work rejected by DMVA or failing to conform to the requirements of the Contract Documents, whether discovered before, or after Substantial Completion and whether or not fabricated, installed, or completed. Costs for correcting such rejected Work, including additional testing and inspections and compensation for DMVA services and expenses made necessary thereby, shall be at the Contractor's expense.
 - b. The **INSPECTOR IS NOT AUTHORIZED to revoke, alter, enlarge, or relax any of the provisions of these specifications, nor TO CHANGE THE CONTRACT WORK IN ANY PARTICULAR** except as stipulated by authorized bulletin. **This includes the SHOP DRAWING SUBMITTAL sequence**, which, if altered, will delay contract progress. See Section 01250 CONTRACT MODIFICATION PROCEDURES.
18. **Inspection:** Contractor shall at all times permit and facilitate inspection of the work by the director. The state unit will designate an inspector for this contract. It will be the responsibility of this contractor to notify the inspector of the date operations are to start and to contact the inspector periodically during the course of the work to insure that work is being performed in accordance with the conditions of this contract.
- a. The **INSPECTOR IS NOT AUTHORIZED to revoke, alter, enlarge, or relax any of the provisions of these specifications, nor TO CHANGE THE CONTRACT WORK IN ANY PARTICULAR** except as stipulated by authorized bulletin. **This includes the SHOP DRAWING SUBMITTAL sequence**, which, if altered, will delay contract progress. See Section 01250 CONTRACT MODIFICATION PROCEDURES.
 - b. In no instance shall any action or omission on the part of the inspector relieve the contractor of the responsibility of completing work in accordance with the contract documents. **Correction of unauthorized changes and deviations from contract documents will be made at the Contractor's expense.** See paragraph 17.a.1 thru 5 immediately above.
19. **Termination for Breach:** The state may terminate this contract when violations are not stopped immediately and corrected within a reasonable length of time after notification by the director or when the approved progress schedule is not met because of failure of the contractor to prosecute the work. In the event of such termination, the state may complete the contracted work and the contractor will be liable for any excess cost occasioned the state thereby and in such case the state may take possession of and utilize in completing the work such materials and equipment as may be on the site and necessary.
20. **Clean Up:** Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his/her employees or work and at the completion of the work, he/she shall remove all his/her waste, tools, equipment, staging and surplus materials from the structure and grounds and leave his/her work clean and ready for use.
21. **Guarantee:** Contractor shall furnish the state with a written guarantee to remedy any defects due to faulty materials or labor which appear in the work within one year from the date of final acceptance by the state.
22. **Payment:** Payment for the work will be made in one sum at the completion of the contract except that a single progress payment may be made at any time during the construction period for the value of the work completed, except in no case shall the amount of the payment exceed 50 percent of the value of the contract. If contractor expects to request partial payment, he/she shall submit a schedule of costs and quantities of the various parts of the work aggregating the total contract sum. When applying for payments, the contractor shall submit a statement based upon this schedule, itemized and supported as the director may require. Contract will not be considered complete until the work has been finally accepted by the state unit and the director and the attached

"Guarantee and Statement" (DMB-437) has been completed and signed by the contractor.

- a. **Master Vendor/Payee File** - In order to receive payments you must have completed a Taxpayer Identification Number and Certification Form W-9 and be listed in the State's master vendor/payee file. This number is required before any payments can be processed. You can verify your number or be put into the system by contacting the following:

Department of Treasury
Registration Division
Treasury Building
Lansing, Michigan 48922
Telephone (517) 373-6380

OR

Department of Military & Veterans Affairs
Construction & Facilities Management Office
3423 N. Martin Luther King Blvd.
Lansing, Michigan 48906
Telephone (517) 481-7558

GENERAL REQUIREMENTS

1. Coordination & Salvage:
 - a. **Salvage – None.**
 - b. **The state unit will provide the following work - Moving Furnishings and Equipment:** The contractor shall give timely notice to state unit of all furnishings and movable equipment that will interfere with project work or which the contractor cannot protect with coverings of paper, plastic, drop cloths or clean tarpaulin. The contractor shall furnish, install, maintain and remove all coverings used to protect furnishings and movable equipment.
2. **Utilities Interruption:** Any building utility service interruptions or outages, including heat, required by the contractor in performing the work shall be prearranged with the staff of the state unit and shall occur only during those scheduled times.
3. **Cutting and Patching:** See Specification Section CUTTING AND PATCHING.
4. **Mechanical Alterations**
 - a. All work which will necessitate shutting down of existing plumbing systems shall be made at such time, or in such a way, as will not interfere with the normal use of the existing building. Coordination will be made with the Facility Manager.
 - b. Where project requires replacement of heating equipment, provisions will be made by the contractor to maintain building temperature, as required.
 - c. Any cutting of floors, walls, roofs, or ceilings required to run new work or remove existing work, shall be performed by the contractor requiring same and all patching or repairs shall be done by the contractor responsible to the full satisfaction of the Owner and project documents.
5. **Project Meetings:**
 - a. **Preconstruction Conference:** The DMVA, Construction and Facilities Management Office, Technical Services Section will schedule a preconstruction conference to be attended by the facility's point-of-contact (POC) and the contractor to discuss the work schedule, contract documents, and payments. Once the project has been started, the contractor shall carry it to completion without delay.
 - b. **Meetings:** The state unit may schedule meetings to be held on the job site whenever needed to supply information necessary to prevent job interruptions, to observe the work or to inspect completed work. The contractor shall be represented at each meeting by persons with full authority to act for the contractor in regard to all portions of the work.
6. **Shop Drawings and Project Data:** See Specification Section SUBMITTALS.
7. **Temporary Utilities/Services:**
 - a. The contractor shall furnish and install all temporary facilities and controls required by the work, shall remove them from state property upon completion of the work, and the grounds and existing facilities shall be restored to their original condition.
 - b. Water and electricity will be available in the area where work will be performed. The contractor will not be charged for reasonable use of these services for construction operation. The contractor shall pay costs for installation and removal of any temporary connections including necessary safety devices and controls. Use of services shall not disrupt or interfere with operations of the state unit.
 - c. **Temporary Sanitary Facilities:** The state unit will designate a permanent toilet facility on the premises for use by personnel employed in the work. The contractor shall repair any damage to the toilet facility caused by his/her employees.
8. **Construction Aids:**

- a. The contractor shall furnish, install, and maintain as long as necessary and remove when no longer required, safe and adequate scaffolding, ladders, staging, platforms, chutes, railings, hoisting equipment, etc., as required for proper execution of the work. All construction aids shall conform to federal, state, and local codes or laws for protection of workers and the public.
9. **Barriers and Enclosures:** The contractor shall furnish, install and maintain as long as necessary and remove when no longer required adequate barriers, warning signs or lights at all dangerous points throughout the work for protection of property, workers, and the public. The contractor shall hold the State of Michigan harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the work under the contract.
10. **Contract Close Out:**
 - a. **Substantial Completion:** The contractor shall notify the state unit when the work will be substantially complete and ready for inspection and preparation of a list of minor replacement, correction and adjustment items. The contractor shall be represented on the job site at the time this inspection is made and thereafter shall complete all work by the date set for final acceptance by the owner.
 - b. **Cleaning:**
 - 1) **Regular Cleaning:** All scrap or removed material, debris or rubbish shall be regularly removed from the project at the end of each working day. No discarded material shall be deposited on the grounds of the state unit without the express permission of the physical plant engineer or administrative officer. No salvage or surplus material may be sold on the premises of the state unit.
 - 2) **Final Cleaning:** Just prior to final acceptance by the state unit, the contractor shall clean all of the work and existing surfaces, building elements and contents that were soiled by project operations and make repairs for any damage or blemish that was caused as a result of project operations.
11. **Record Documents:** The contractor shall furnish “Final Record” or “As-Built”, documents to DMVA, Design Section, **with, or prior to, the request for final payment.** Contractor shall maintain a mark-up set of project drawings and specifications; include any deviations between the “as-built” installation and the Contract Documents. **Failure or delay in submitting Project Record Documents WILL STOP and cause delay in final payment disbursement.**
12. **Warranties:** The contractor shall forward to the state unit Form DMB-437 covering statements concerning guarantee and indebtedness, and any other special warranties or requirements of the contract documents.

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DIVISION 1 – GENERAL REQUIREMENTS

01100 SUMMARY OF WORK

1.0 DESCRIPTION

- A. This Section supplements each section of this specification to provide complete work as indicated, or required, to obtain the end product.

1.1 WORK SEQUENCE

- A. Work shall be phased to not interrupt the owner's operations.
- B. Utility connections – No utility services shall be interrupted to make connections, to relocate, or for any purpose without approval of the **Facility Manager**.

1.2 CONTRACTOR USE OF PREMISES

- A. Contractor's use of the premises is limited only by the Owner's right to occupy and continue routine work operations at the site.
1. Confine operations at site to areas permitted or directed by DMVA.
 2. Do not unreasonably encumber site with materials or equipment.
 3. Move stored products which interfere with owner's operations.
 4. Assume responsibility for protection of materials/products stored on premises.

1.3 CONTRACTOR'S DUTIES

- A. Provide and pay for labor, materials, tools, required construction equipment and machinery, and other facilities and services necessary, for proper execution and completion of work.
1. Pay sales, consumer and use taxes.
 2. Comply with codes, regulations, orders and other legal requirements.
 3. Give notices to inspecting and facility personnel.
 4. Secure and pay for licenses, fees and permits. Contractor shall apply for and receive all required permits for the project **PRIOR TO COMMENCING WORK** of any kind. Permits must be posted per requirements stated on each permit and a copy of each permit **MUST BE FORWARDED TO DMVA** in Lansing.

1.4 CONTRACTOR RESPONSIBILITIES

- A. Contractor is responsible for visiting the site and reviewing the complete set of bid documents to determine procedures, space requirements, required materials, installation sequences, etc. and shall coordinate his efforts with all others throughout the project.
- B. Contractor will not be allowed extra compensation for any existing conditions which Contractor, as a bidder, could have reasonably informed himself prior to bidding.
- A. **Protect existing utilities** from damage, to include preventive measures such as hand digging, supporting, etc., and obtaining MISS DIG, or similar, locating and marking services.
1. Utilities shown on the drawings are as recorded on and interpreted from "As-Built", record drawings in DMVA files, or from site surveys.
underground utilities, Contractor shall ascertain exact locations of utilities. **Damage to known, indicated utilities shall be satisfactorily repaired at the Contractor's expense.**

1.5 PROGRESS SCHEDULE AND PRE-AWARD SUBMITTALS

- A. Contractor shall review all contract requirements, code requirements, permit procurement requirements, and paragraphs 1.1 thru 1.4 immediately above.

- B. Contractor shall ascertain labor, product procurement and installation, project inspections and corrections, and any other conditions which may affect the duration of this project.
- C. **Contractor shall submit, per Section SUBMITTAL PROCEDURES and prior to commencing any work, a “PROJECT PROGRESS SCHEDULE” which clearly indicates when work will commence, when each phase will start and be completed, and when all work will be complete and Contractor shall submit pre-award submittals per INSTRUCTIONS TO BIDDERS paragraph “PRE-AWARD SUBMITTALS”.**

1.6 UTILITY USE

- A. The State will make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies; including reasonable temporary construction heat where equipment exists. Where no equipment exists, the Contractor, at his expense and in a workmanlike manner satisfactory to the State, shall install and maintain heating equipment, all necessary temporary connections and distribution lines, and any meters required to measure amount of each utility. Before final acceptance of the Work by the State, the Contractor shall remove all temporary equipment, connections, distribution lines, meters, and associated paraphernalia.
- B. Electric Power for Small Tools not exceeding 20 amperes and 115 volts will be furnished from existing outlets at no cost to the Contractor, subject to proper use, and that total estimated consumption will not exceed 1,000 kilowatts per month.
- C. Potable Water is available at no cost to the Contractor, subject to site conditions and proper use.

1.7 PROTECTION

- A. Contractor will be responsible for protection of Government property during project duration and exercise care to prevent damage thereto. Damage to property resulting from contractor’s operations shall be repaired or replaced by the contractor at his expense.
- B. Protect installed, and existing adjacent, work until accepted.
- A. Protect and secure building openings, work in progress, and installed work against unauthorized entry or traffic throughout duration of project to preclude injury or damage.

END OF SECTION 01100

DIVISION 1 – GENERAL REQUIREMENTS

01250 CONTRACT MODIFICATION PROCEDURES

1.0 DESCRIPTION

A. This Section supplements each section of this specification to provide administrative and procedural requirements for handling and processing Contract modifications (Bulletins).

1.1 MINOR CHANGES IN THE WORK

A. DMVA will issue through Construction Manager/Inspector supplemental instructions authorizing Minor Changes in Work, not involving adjustment to the Contract Sum or the Contract Time, on DMVA's Supplemental Instructions form.

1.2 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests – DMVA's Construction Manager/Inspector will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by DMVA Construction Manager/Inspector are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within 14 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's Schedule indicating effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting Completion Date extension.

B. Contractor-Initiated Proposals – If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Construction Manager/Inspector.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements of Instructions to Bidders paragraph 8 "Substitution of Materials" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form – For Change Order proposals, use forms provided by DMVA. Sample copies

will be provided at the Preconstruction Meeting and are available from DMVA.

- 1.3 CHANGE ORDER PROCEDURES – On DMVA’s approval of a Proposal Request, the Construction Manager/Inspector will issue a Change Order for Signatures of DMVA and Contractor on form provided by DMVA.
- 1.4 CONSTRUCTION/WORK CHANGE DIRECTIVE
 - A. Construction/Work Change Directive – DMVA’s Construction Manager/Inspector may issue a Construction Change Directive request in writing. A Change Directive request instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Bulletin.
 1. Construction/Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
 - B. Documentation – Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract, or state NONE, if none.

END OF SECTION 01250

DIVISION 1 – GENERAL REQUIREMENTS

01330 SUBMITTAL PROCEDURES

1.0 DESCRIPTION

- A. This Section provides administrative and procedural requirements for submitting Shop Drawings, Product Data, and miscellaneous submittals indicated.
1. Pre-Award Submittals
 2. Shop Drawings, Product Data, and Samples.
 3. Contractor’s Construction Schedule.
 4. Submittals Schedule.
 5. Subcontractors and Vendors list.
 6. Schedule of Values.
 7. Certificates of tests, inspections, and approvals.
 8. List of items to be completed or corrected (Punch List)

1.1 MAILING ADDRESS

- A. Submit to
- DEPARTMENT OF MILITARY AND VETERANS AFFAIRS**
Construction & Facilities Management Office
3423 N. Martin Luther King Blvd.
Lansing, Michigan 48906.

POC FOR DESIGN INQUIRIES IS

BEN KOPIETZ 517 481-7552

1.2 DMVA APPROVAL

- A. Approval of submittals is for general compliance with project documents and shall not be construed as relieving the Contractor of his responsibilities under this contract; further, approval is for conformance to the design concept of the Project. **The Contractor is fully responsible for reviewing the shop drawings, calculating quantities, taking dimensions, and satisfactorily incorporating each item or product into the Project to provide indicated results.**

1.3 COORDINATION

- A. Contractor is responsible to perform activities in regard to submittals with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors/subcontractors. **Contractor/subcontractors are not allowed to perform work requiring product submittals until the submittals have been Submitted and Approved.**
- B. Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. DMVA reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

2.0 PRODUCTS

- A. No work requiring submission of a Shop Drawing, Product Data, or Sample listed below shall be commenced, or product installed, until the submittal has been approved by the DMVA.

- B. All work shall be in accordance with the approved submittals.
- C. Submittal requirements for items listed below are described in each respective specification Section.
- A. Required submittals include, but may not be limited to, the following:

Section	Item
At Preconstruction Meeting	Schedule of Values
At Preconstruction Meeting	List of Subcontractors and Vendors
Instructions to Bidders para 9	Pre-award Submittals
General Requirements para 10	Record Documents
Instructions to Bidders	
General Conditions	
General Requirements	
Index to Specifications	

See SUBMITTALS under each Section for requirements of each Section.

DIVISION 7 – THERMAL & MOISTURE PROTECTION

- 07210 Building Insulation
- 07841 Through-Penetration Firestop Systems
- 07920 Joint Sealants

DIVISION 8 – DOORS AND WINDOWS

- 08110 Steel Doors and Frames
- 08710 Finish Hardware

DIVISION 9 - FINISHES

- 09111 Non-Load-Bearing Steel Framing
- 09260 Gypsum Board
- 09511 Acoustical Panel Ceilings, Metal Grid
- 09653 Resilient Wall Base and Accessories
- 09900 Painting

DIVISION 10 – SPECIALTIES

- 10431 Signs
- 10605 Wire Mesh Partitions

DIVISION 15 – MECHANICAL

- 15010 General Mechanical Requirements
- 15081 Duct Insulation

DIVISION 16 – ELECTRICAL

- 16010 General Electrical Requirements
- 16051 Common Work Results for Electrical
- 16060 Grounding and Bonding
- 16120 Conductors and Cables
- 16130 Raceways and Boxes
- 16140 Wiring Devices

16145 Lighting Control Devices
16750 Voice & Data Cabling

3.0 EXECUTION

3.1 SUBMITTALS

- A. Quantity – **DMVA will retain three copies of each submittal**, submit not less than five copies of submittals, **checked and approved by the contractor**.
- B. Contractor shall check, mark, and approve each copy to show applicable product selection and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information.
 - 1. **Submittals not checked and marked approved by the General Contractor to indicate his review will be returned NOT APPROVED, for resubmittal.**
- C. If stock shop drawings and/or data are submitted, modify to show coordination with surrounding materials and work by others which will affect work covered by shop drawings. Where specifications require manufacturer’s printed instructions, they shall accompany each copy of submittals.
- D. Submittals will be accepted only **from the General Contractor**. Submittals from subcontractors or suppliers sent directly to DMVA will be returned to the Contractor for review, approval, marking.
- E. Quality control submittals, including design data, certifications, manufacturer’s instructions, manufacturer’s field reports, and other quality-control information shall be submitted as required under each respective Section of the Specification.
- F. Changing Suppliers will render previously approved submittals NULL & VOID and will require submittal of NEW paperwork to reflect the new supplier’s products.

3.2 RESUBMITTAL REQUIREMENTS

- A. Shop drawings
 - 1. Revise initial submittals and resubmit.
 - 2. Indicate on submittals any changes which have been made.

END OF SECTION 01330

DIVISION 1 – GENERAL REQUIREMENTS

01420 REFERENCES

1.0 DESCRIPTION

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

1.1 SPECIFICATION CONTENT EXPLANATION

- A. These Specifications use certain conventions for language style and intended meaning of certain terms, words, and phrases. These conventions are as follows:
 - 1. Abbreviated Language is used in Specifications and other Contract Documents. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as context of Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in imperative mood are to be performed by Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled.

1.2 DEFINITIONS – Basic Contract definitions are included in AIA Document A201 as a reference.

- A. “Approved” – When used to convey DMVA’s action on Contractor’s submittals, applications, and requests, “approved” is limited to the DMVA’s duties and responsibilities as stated in the Conditions of the Contract and Specification Section SUBMITTALS.
- B. “Contract Documents” – Drawing(s) and Specifications with any Addenda or Bulletins issued.
- C. “Directed” – A command or instruction by DMVA. Other terms including “requested,” “authorized,” “selected,” “approved,” “required,” and “permitted” have the same meaning as “directed.”
- D. “Furnish” – Supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- E. “Indicated” – Requirements expressed by graphic representations or in written form on Drawings; in Specifications, and in other Contract Documents. Other terms including “shown,” “noted,” “scheduled,” and “specified” have the same meaning as “indicated.”
- F. “Install” – Operations at the Project site including the unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. “Installer” – Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, or similar operations
 - 1. Assigning Specialists – Certain Sections of the Specifications require specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - 2. “Experienced,” – When used with an entity, “experienced” means having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being

familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

3. Trades – Using terms such as “carpentry” does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter.” It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.

- H. Project Inspector – A State employee, acting on behalf of the DMVA, providing on-site inspection of the Work **for compliance with** the Contract Documents.
- I. “Project Site” – Space available for performing construction activities. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- J. “Provide,” furnish and install, complete and ready for the intended use.
- K. “Regulations” – Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements in construction industry that control performance of Work.
- L. “Testing Agencies” – Independent entities engaged to perform specific inspections or tests, at Project site, or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards – Unless Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent of reference. Such standards are made a part of Contract Documents by reference.
- B. Publication Dates – Comply with the standards in effect as of the date of the Contract Documents, unless otherwise indicated.
- C. Conflicting Requirements – If compliance with 2 or more standards is specified and the standards establishing different or conflicting requirements for minimum quality levels, comply with most stringent requirement.
 1. Minimum Quality Levels shown or specified shall be the minimum provided or performed. Actual installation may comply exactly with minimum quality specified, or it may exceed minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to DMVA for a decision before proceeding.
- D. Copies of Standards – Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - A. Abbreviations and Acronyms for Standards and Regulations – Where abbreviations and acronyms are used in the Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research ‘s “Encyclopedia of Associations” or in Columbia Books “National Trade & Professional Associations of the U.S.”

END OF SECTION 01420

DIVISION 01 – GENERAL REQUIREMENTS**01700 EXECUTION REQUIREMENTS****1.0 DESCRIPTION**

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
1. Construction layout.
 2. General installation of products.
 3. Progress cleaning.
 4. Starting and adjusting.
 5. Protection of installed construction.
 6. Correction of the Work.

2.0 PRODUCTS – Not applicable.**3.0 EXECUTION****3.1 EXAMINATION**

- A. Existing Conditions – The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify existing conditions and location of mechanical and electrical systems and other construction affecting the Work.
- B. Existing Utilities – The existence and location of utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of utilities and other construction affecting the Work.
- C. Acceptance of Conditions – Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information – Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements – Take field measurements as required fitting the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements – Verify space requirements and dimensions of items shown diagrammatically

on Drawings.

- D. Review of Contract Documents and Field Conditions – Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Information (RFI) to DMVA Designer or Construction Manager. Include a detailed description of problem encountered, together with recommendations for changing the contract documents.

3.3 CONSTRUCTION LAYOUT

- A. General – Locate the Work and components of the Work accurately, in correct alignment, as indicated.
 - 1. Make vertical work plumb and horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 8’ in spaces without a suspended ceiling.
- B. Comply with manufacturer’s written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment – Do not use tools or equipment that produces harmful noise levels.
- F. Templates – Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners – Provide anchors and fasteners as required anchoring each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights – Where mounting heights are not indicated, mount components at heights directed by DMVA Designer or Construction Manager.
 - 2. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.

3.4 PROGRESS CLEANING

- A. General – Clean Project work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
- B. Work Areas – Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 - C. Installed Work – Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - D. Concealed Spaces – Remove debris from concealed spaces before enclosing the space.
 - E. Exposed Surfaces – Clean exposed surfaces and protect as necessary to ensure freedom from damage or deterioration at time of Substantial Completion.
 - F. Waste Disposal – Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted. **Using the Facility’s Dumpster will not be permitted.**
 - G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - I. Limiting Exposures – Supervise construction operations to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- 3.5 STARTING AND ADJUSTING
- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
 - B. Adjust operating components for proper operation without binding. Replace damaged and malfunctioning controls and equipment.
 - C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - D. Manufacturer’s Field Service – If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in each Specification Section.
- 3.6 PROTECTION OF INSTALLED CONSTRUCTION
- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
 - B. Comply with manufacturer’s written instructions for temperature and relative humidity.
- 3.7 CORRECTION OF THE WORK
- A. Repair or remove and replace defective construction. Remove damaged substrates and finishes.

Comply with Requirements in Section CUTTING AND PATCHING.

- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- A. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

END OF SECTION 01700

DIVISION 01 – GENERAL REQUIREMENTS**01731 CUTTING AND PATCHING****1.0 DESCRIPTION**

- A. Provide cutting and patching indicated or required.
 - 1. Remove existing work indicated for “Demolition” or “Removal”.
 - 2. Uncover or remove work to provide for installation of products.
 - 3. Install specified work in existing construction.
 - 4. Make several parts fit together properly.
 - 5. Uncover work to provide for inspector observation of covered work.
 - 6. Remove and replace work not conforming to contract requirements.
 - 7. Remove and replace defective products or workmanship.

1.1 DEFINITIONS

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

1.2 PAYMENT FOR COSTS

- A. Costs resulting from defective work and products, incorporation of Contractor selected substitute or alternate products, ill-timed work, or work not conforming to contract documents, payment shall be by the Contractor.
- B. Work done by Change Order instructions of DMB, payment shall be by DMVA.

1.3 QUALITY ASSURANCE

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

2.0 PRODUCTS

- A. General – Comply with requirements specified in other Sections.
- B. In-Place Materials – Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will

match the visual and functional performance of in-place materials.

- C. Comply with original “construction documents”, and subsequent alterations/maintenance project documents, for installed materials and methods.
- D. To aide in selection of Cutting & Patching repair products, DMVA files include original project “construction documents” for most facilities and archive documents for all maintenance projects.
 - 1. To receive assistance for document access “for `in-office` viewing purposes only”, contact DMVA Design Services Representative indicated in INSTRUCTIONS TO BIDDERS paragraph “**Interpretation of Contract Documents**”, or contact your DMVA Inspecting Representative for scheduling a review date/time.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility – Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.
- B. Examine existing conditions to determine extent of cutting and patching required to incorporate new work into existing.
- C. Examine for existing elements subject to damage during cutting and patching.
- D. Examine for and correct detrimental conditions affecting installation of new products.
- E. Correction of visible detrimental conditions affecting proper installation of products shall be accomplished by the Contractor as a part of this Contract at no additional cost.

3.2 PREPARATION PRIOR TO CUTTING

- A. Provide support and bracing required to maintain structural integrity.
- B. Provide protection against damage and loss of any portion of project.
- C. Provide protection from the elements.
- D. Existing Utility Services and Mechanical/Electrical Systems – Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
 - 1. Prior to cutting and patching operations, notify using personnel to enable shutting down operations to avoid loss of work in progress.
- E. Provide for barricading work areas, and finished work to protect against unauthorized entry and possible resultant injury or damage while executing cutting and patching operations.

3.3 PERFORMANCE

- A. General – Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting – Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly, to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces – Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry – Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Mechanical and Electrical Services – Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 5. Proceed with patching after construction operations requiring cutting and patching are complete.
- C. Patching – Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection – Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes – Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls – Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new matching materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings – Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure – Patch components in a manner that restores enclosure to a weathertight condition and to match adjacent construction components.
- A. Cleaning – Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, dirt and dust, and similar materials.

END OF SECTION 01731

DIVISION 7 – THERMAL AND MOISTURE PROTECTION**07210 BUILDING INSULATION****1.0 DESCRIPTION**

- A. Provide building insulation indicated.
 - 1. Sound attenuation blanket insulation; see Section GYPSUM BOARD para 2.6.C.

1.1 SUBMITTALS

- A. Product Data – For each type of product indicated.
- B. Manufacturer’s Installation Instructions to include special environmental conditions required for installation, and installation techniques.

1.2 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics – Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface Burning Characteristics – ASTM E84.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage from deterioration by moisture, soiling, and other sources. Store inside and in a dry location Comply with manufacturer’s written instructions for handling, storing, and protecting during installation.

2.0 PRODUCTS**2.1 AVAILABLE MANUFACTURERS – Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.**

- A. Glass Fiber Insulation
 - 1. CertainTeed Corp.
 - 2. Johns Manville Corporation.
 - 3. Knauf Fiber Glass.
 - 4. Owens/Corning.

- B. Unfaced Glass-Fiber Blanket Insulation - ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

3.0 EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations, including removing projections capable of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry.
- C. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation.
- D. Water-Piping Coordination – If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.4 INSTALLATION, GENERAL BUILDING INSULATION

- A. Apply insulation units to substrate by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Install mineral-fiber in cavities formed by framing members according to the following:
 - 1. Use Insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3” clearance of insulation around recessed lighting fixtures.
 - 4. For metal-framed wall cavities where cavity heights exceed 96”, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
- C. Stuff glass fiber loose fill insulation into miscellaneous voids and cavity spaces to provide continuous insulation throughout. Compact to approximately 40 percent of normal maximum volume to a density of approximately 2.5#/cf.

3.6 PROTECTION

- A. Protect installed insulation physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.7 INSULATION SCHEDULE

- A. See Drawings for types, thickness, and location of each insulation type.

END OF SECTION 07210

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07841 THROUGH-PENETRATION FIRESTOP SYSTEMS

1.0 DESCRIPTION

- A. Provide through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.1 SUBMITTALS

- A. Product data for each type of product specified.
- B. Product test reports from, and based on tests performed by, a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products.

1.2 PERFORMANCE REQUIREMENTS

- A. General – For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
 - 1. Fire-resistance-rated walls including fire partitions, fire barriers and smoke barriers.
 - 2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies.
- B. F-Rated Through-Penetration Firestop Systems - Provide through-penetration firestop systems with F ratings determined per ASTM E 814, not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
- C. T-Rated Through-Penetration Firestop Systems - Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where the following conditions exist:
 - 1. Where firestop systems protect penetrations located outside of wall cavities.
 - 2. Where firestop systems protect penetrations located outside fire-resistive shaft enclosures.
 - 3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
 - 4. Where firestop systems protect penetrating items larger than a 4" diameter nominal pipe or 16 sq. in. overall cross-sectional area.
- D. Fire-Resistive Joint Sealants - Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
- E. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
 - 2. For floor penetrations with annular spaces exceeding 4" or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not

requiring removal of insulation.

1.3 QUALITY ASSURANCE

- A. Information on drawings referring to specific design designations of through-penetration firestop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation. Any changes in conditions and designated systems require the Department of Military Affairs' prior approval. Submit documentation showing the performance of proposed substitutions equals or exceeds that of the systems they would replace and are acceptable to authorities having jurisdiction.
- B. Installer Qualifications - Engage an experienced Installer who has completed firestopping similar in material, design, and extent to that indicated for Project that has been accepted by authorities having jurisdiction, and has performed successfully.
- C. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."
- D. Coordinating Work - Coordinate construction of openings and penetrating items to ensure designated through-penetration firestop systems are installed per specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi-component materials.
- B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

2.0 PRODUCTS

2.1 FIRESTOPPING, GENERAL

- A. Compatibility - Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Accessories - Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include, but are not limited to, the following:
 - 1. Permanent forming/damming/backing materials including the following:
 - a. Semirefractory fiber (mineral wool) insulation.
 - b. Ceramic fiber.
 - c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
 - d. Fire-rated formboard.
 - e. Joint fillers for joint sealants.
 - 2. Temporary forming materials.

3. Substrate primers.
4. Collars.
5. Steel sleeves.

C. Applications - Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.2 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

- A. Ceramic-Fiber and Mastic Coating - Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating.
- B. Ceramic-Fiber Sealant - Sing-e-component formulation of ceramic fibers and inorganic binders.
- C. Endothermic, Latex Compound Sealant - Sing-e-component, endothermic, latex formulation.
- D. Intumescent, Latex Sealant - Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.
- E. Job-Mixed Vinyl Compound - Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
- F. Mortar - Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.
- G. Pillows/Bags - Re-u-able, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
- H. Silicone Foam - Two--component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, nonshrinking foam.
- I. Silicone Sealant - Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicted below:
 1. Grade for Horizontal Surfaces - Pourable (self-leveling) grade for openings in floors and other horizontal surfaces.
 2. Grade for Vertical Surfaces - Nonsag grade for openings in vertical and other surfaces.
- J. Solvent-Release-Curing Intumescent Sealant - Solvent-release-curing, single-component, synthetic-polymer-based sealant of grade indicated below:
 1. Grade for Horizontal Surfaces - Pourable (self-leveling) grade for openings in floors and other horizontal surfaces.
 2. Grade for Vertical Surfaces - Nonsag grade for openings in vertical and other surfaces.
- K. Available Products - Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 1. Ceramic-Fiber and Mastic Coating
 - a. Fire Master Bulk and Fire Master Mastic, Thermal Ceramics.
 2. Ceramic-Fiber Sealant
 - a. Metacaulk 525, The RectorSeal Corporation.

3. Endothermic, Latex Sealant
 - a. Fyre-Shield, Tremco Inc.
 6. Endothermic, Latex Compounds
 7. Flame-Safe FS500/600 Series, International Protective Coatings Corp.
 8. Flame-Safe FS900/FST900 Series, International Protective Coatings Corp
 9. Intumescent Latex Sealant
 - Metacaulk 950, The RectorSeal Corporation.
 - Fire Barrier CP 25WB Caulk, 3M Fire Protection Products.
 10. Intumescent Putty
 - a. Pensil 500 Intumescent Putty, General Electric Co.
 - b. Flame-Safe FSP1000 Putty, International Protective Coatings Corp
 - c. Fire Barrier Moldable Putty, 3M Fire Protection Products.
 11. Intumescent Wrap Strips
 - a. Dow Corning Fire Stop Intumescent Wrap Strip 2002, Dow Corning Corp
 - b. CS2420 Intumescent Wrap, Hilti Construction Chemicals, Inc.
 - c. Fire Barrier FS-195 Wrap/Strip, 3M Fire Protection Products.
 Job-Mixed Vinyl Compound
 USG Firecode Compound, United States Gypsum Co.
 12. Mortar
 - a. K-2 Firestop Mortar, Bio Fireshield, Inc.
 - b. Novasit K-10 Firestop Mortar, Bio Fireshield, Inc.
 - c. KBX-Mortar Seal, International Protective Coatings Corp.
 13. Pillows/Bags
 - a. Firestop Pillows, Bio Fireshield, Inc.
 - b. KBS Sealbags, International Protective Coatings, Corp.
 14. Silicone Foams
 - a. Dow Corning Fire Stop Foam 2001, Dow Corning Corp.
 - b. Pensil 200 Foam, General Electric Co.
 15. Silicone Sealants
 - a. Dow Corning Firestop Sealant 2000, Dow Corning Corp.
 - b. Dow Corning Firestop Sealant SL 2003, Dow Corning Corp.
 - c. Pensil 100 Firestop Sealant, General Electric Co.
 - d. CS240 Firestop Sealant, Hilti Construction Chemicals, Inc.
 - e. Metacaulk 835, The RectorSeal Corporation.
 - f. Metacaulk 880, The RectorSeal Corporation.
 - g. Fyre-Sil, Tremco Inc.
 - h. Fyre-Sil S/L, Tremco Inc.
 16. Solvent-Release-Curing Intumescent Sealants
 - a. Biostop 500 Intumescent Firestop Caulk, Bio Fireshield, Inc.
 - b. Fire Barrier CP 25N/S Caulk, 3M Fire Protection Products.
 - c. Fire Barrier CP 25S/L Caulk, 3M Fire Protection Products.
- 2.3 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS
- A. Elastomeric Sealant Standard - Provide manufacturer's standard chemically curing elastomeric sealants of base polymer indicated that complies with ASTM C 920 requirements, including those reference for Type, Grade, Class, and Uses, and requirements specified in this Section applicable to fire-resistive joint sealants.
 - B. Sealant Colors - Provide color of exposed joint sealants to complement room color.
 - C. Single-Component, Neutral-Curing Silicone Sealant – Type S; Grade NS; Class 25; exposure-related

Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.

1. Additional Movement Capability - Provide sealant with the capability to withstand the following percentage changes in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated.
 - a. 40% movement in both extension and 25% compression for a total of 65% movement.

D. Multicomponent, Nonsag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.

1. Additional Movement Capability - Provide sealant with the capability to withstand the following percentage change in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, and remain in compliance with other requirements of ASTM C 920 for uses indicated.
 - a. 40% movement in extension and 25% in compression for a total of 65% movement.

E. Single-component, Nonsag, Urethane Sealant – Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.

F. Available Products - Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

1. Single-Component, Neutral-Curing, Silicone Sealant
 - a. Dow Corning 790, Dow Corning Corp.
 - b. Dow Corning 795, Dow Corning Corp.
 - c. Silpruf, General Electric Co.
 - d. Ultraglaze, General Electric Co.
 - e. 864, Pecora Corp.
2. Multicomponent, Nonsag, Urethane Sealant
 - a. Vulkem 922, Mameco International Inc.
 - b. Dynflex, Pecora Corp.
 - c. Dynatred, Pecora Corp.
 - d. Dynatrol II, Pecora Corp.
 - e. Sikaflex 2cn NS, Sika Corp.
 - f. Sonolastic NP 2, Sonneborn Building Products Div., ChemRex, Inc.
 - g. Dymeric, Tremco, Inc.
3. Single-Component, Nonsag, Urethane Sealant
 - a. Isoflex 880 GB, Harry S. Peterson Co., Inc.
 - b. Isoflex 881, Harry S. Peterson Co., Inc.
 - c. Vulkem 921, Mameco International Inc.
 - d. Sikaflex--15LM–Sika Corp.

2.4 MIXING - For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

3.0 EXECUTION

- 3.1 EXAMINATION - Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
- A. Surface Cleaning - Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:
1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
 2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
 3. Remove laitance and form release agents from concrete.
- B. Priming - Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape - Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.
- 3.3 INSTALLING THROUGH-PENETRATION FIRESTOPS
- A. General - Comply with the "System“ Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through-penetration firestop systems proven techniques to produce the following results:
1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- 3.4 INSTALLING FIRE-RESISTIVE JOINT SEALANTS
- A. General - Comply with the "System Performance Requirements" article in Part 1, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install joint fillers to provide support of sealants during application and at position required to

produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

- C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement capability. Install sealants at the same time joint fillers are installed.
- D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.5 CLEANING

- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.
- B. Protect firestopping during and after curing period and contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Acceptance. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

END OF SECTION 07841

DIVISION 7 - THERMAL AND MOISTURE PROTECTION**07920 JOINT SEALANTS****1.0 DESCRIPTION** - Provide joint sealants indicated.

- A. Interior joints
 - 1. Perimeter joints of exterior openings or penetrations.
 - 2. Perimeter joints between wall surfaces and frames of doors.
 - 3. Other joints indicated to be caulked or sealed.

1.1 SUBMITTALS

- A. Product data for each joint sealant product indicated.
- B. Sealant Manufacturer's Recommendations for primers and substrate preparation needed to obtain adhesion.

1.2 SYSTEM PERFORMANCE

- A. Exterior joint sealants shall establish and maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Interior joint sealants shall establish and maintain airtight and water-resistant continuous seals that cause no staining or deterioration of joint substrates.

2.0 PRODUCTS**2.1 MATERIALS**

- A. Interior Sealant, acrylic meeting ASTM C 90; Pecora 60+Unicyrylic; Protective Treatments, Inc., PTI 730 or 767; Tremco Mono.

2.2 JOINT SEALANT BACKING

- A. Sealant Backer Rod shall be expanded polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, nonabsorptive material as recommended by sealant manufacturer(s), round or semi-round in section, containing no oils, solvents, or other materials which will cause staining. Products shall equal Ethafoam by Dow Chemical Co., or Minicel Backer Rod by Hercules Chemical Co.
- B. Bond Breaker Tape - polyethylene or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.3 MISCELLANEOUS MATERIALS

- A. Primer - Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces - Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in

any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.

- C. Masking Tape - Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

3.0 EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints - Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's recommendations and the following:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include concrete and masonry.
- B. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other as indicated.
- C. Prime Joint substrates where recommended by sealant manufacturer. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- D. Use masking tape to prevent sealant contact with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION OF JOINT SEALANTS

- A. Comply with sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard - Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to provide support of sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent joint backings that have become wet prior to sealant application and replace with dry material.
- D. Install bond breaker tape between sealants where sealant backings are not used between sealants and

joint fillers or back of joints.

- E. Install sealants by proven techniques to comply with the following and at the same time backings are installed.
 - 1. Place sealants to they directly contact and fully wet joint substrates.
 - 2. Complete fill recesses provided for each joint configuration, without voids.
 - 3. Provide uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

 - F. Tooling of nonsag sealants - Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- 3.3 CLEAN off excess sealants or sealant smears adjacent to joints as work progress by methods and with cleaning materials approved by manufacturer of joint sealants and of products in which joints occur.

END OF SECTION 07920

DIVISION 8 - DOOR- AND WINDOWS**08110 STEEL DOORS AND FRAMES****1.0 DESCRIPTION**

- A. Provide doors and frames indicated.
 - 1. Steel doors.
 - 2. Steel door frames.

1.1 SUBMITTALS

- A. Product Data for each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction detail, label compliance, sound and fire-resistance ratings, and finishes.
- B. Shop Drawings, show the following:
 - 1. Elevations of each door design.
 - 2. Details of doors including core material, vertical and horizontal edge details.
 - 3. Frame details for each frame type including dimensioned profiles.
 - 4. Details and locations of reinforcement and preparation for hardware.
 - 5. Details of each different wall opening condition.
 - 6. Details of anchorages, accessories, joints, and connections.
- C. Door Schedule - See Drawing sheet 5 of 5 and Section FINISH HARDWARE

1.2 QUALITY ASSURANCE

- A. Steel Door and Frame Standard - Complying with ANSI A-250.8, unless more stringent requirements are indicated.
- B. Fire-Rated Door Assemblies - Assemblies complying with NFPA that are identical listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver Doors and Frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to DMVA Inspector. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid nonvented plastic or canvas shelters which could create humidity chamber. If cardboard wrappers on doors becomes wet, remove cartons immediately. Provide 1/4" space between stacked doors to promote air circulation.

2.0 PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Subject to requirements, products which may be incorporated in the work include, but are not

limited to, the following:

1. Amweld Building Products, Inc.
2. Ceco Door Products
3. Steelcraft

2.2 MATERIALS

- A. Hot-Rolled Steel Sheets - ASTM–A 569, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled
- B. Cold-Rolled Steel Sheets - ASTM–A 366, Commercial Steel (CS), or ASTM A 620, drawing steel (DS), Type B; stretcher-leveled standard of flatness.

2.3 DOORS

- A. Steel Doors - Provide doors of sizes, thicknesses, finishes, as indicated.
- B. Interior Doors – Reference Door Schedule on Drawings and provide doors complying with requirements indicated below by referencing ANSI 250.8 for level and model and ANSI 250.4 for physical-endurance level:
 1. Level 2 and Physical Performance Level B, Heavy Duty, 0.042" thick faces (18 gauge), Model 1, Full Flush.
 2. See DOOR SCHEDULE on Drawings for rated openings.

2.4 FRAMES

- A. Reference Door Schedule on Drawings and provide steel frames for door openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.
- B. Door Silencers - Drill stops and install 3 silencers on strike jambs of single-door frames.
- C. Supports and Anchors - Fabricated from not less than 0.042" thick, electrolytic zinc-coated or metallic-coated steel sheet.
 1. Wall Anchors in Masonry Construction - 0.17-" diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.
- D. Inserts, Bolts, and Fasteners - Manufacturer's standard units.

2.5 FABRICATION, GENERAL

- A. Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project Site.
- B. Interior Door Faces - Fabricate exposed faces of doors and panels from the following material:
 1. Cold-rolled steel sheet.
 2. Metallic-coated steel sheet where indicated.
- C. Core Construction, As Indicated - One of the following manufacturer's standard core materials that produce a door complying with SDI standards:
 1. Resin-impregnated kraft/paper honeycomb.
 2. Vertical steel stiffeners.
 3. Rigid mineral fiber board.

- D. Clearances for Non-Fire-Rated Doors - Not more than 1/8" at jambs and heads, except not more than 1/4" between pairs of doors. Not more than 3/4" at bottom.
 - E. Single-Acting, Door-Edge Profile - Bevel edge, unless square edge is indicated.
 - F. Tolerances - Comply with SDI 117, "Manufacturing tolerances Standard Steel Doors and Frames.
 - G. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold-rolled or hot-rolled steel sheet.
 - H. Exposed Fasteners - Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
 - I. Hardware Preparation - Prep-re doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.
 - 1. Reinforce doors and frames at all locations to receive indicated hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
 - 2. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
 - J. Frame Construction - Construct frames to standard double rabbeted shapes.
 - 1. Fabricate frames with mitered or coped corners, continuously welded construction for exterior applications and knocked-down for field assembly at interior applications.
 - 2. Fabricate knock-down, drywall slip-on frames for in-place gypsum, board partitions.
 - 3. Fabricate welded frames with temporary spreader bars.
 - 4. Provide terminated stops, unless otherwise indicated.
 - K. Grout full frames set in either concrete or masonry construction.
 - L. Special Features
 - 1. Provide adjustable corrugated tee anchors where frames are to be set in masonry walls. Frames up to 7'4" high shall have three anchors per jamb.
 - 2. Frames set into existing openings shall be provided with jamb anchors consisting of spacers and countersunk thru-bolts installed in factory-countersunk holes. A minimum of six jamb anchors and two base anchors shall be supplied and installed with each frame.
 - a. Frames set into existing masonry or concrete openings shall be factory drilled and fitted with plugs for grouting after setting into position.
 - 3. Jamb legs shall extend only to finish floor line and have 14 gauge anchor clips.
- 2.6 FINISHES, GENERAL
- A. Prime Finish Doors and Frames
 - 1. Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.
 - 2. Frames to be set into masonry or concrete shall be given a factory applied coat of heavy asphalt paint to interior surfaces.

3.0 EXECUTION

- 3.1 INSTALLATION - Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data', and as specified.
- A. Placing Frames - Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.
 - B. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove braces and spreaders leaving surfaces undamaged.
 - 1. Except for frames located at in-place concrete or masonry and at drywall installations, place frames prior to construction at enclosing walls and ceilings.
 - 2. Install at least 3 wall anchors per jamb adjacent to hinge locations on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with anchorage devices.
 - 3. At existing construction openings, install at least 3 completed opening anchors per jamb adjacent to hinge locations on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 - a. Countersunk bolt heads shall be filled with auto body filler (i.e., Bondo), sanded smooth and flush with frame to become inconspicuous when primed and painted.
 - 4. In stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In stud partitions, attach wall anchors to studs with screws.
 - 5. At in-place gypsum board partitions, install knock-down, drywall frames.
 - 6. Masonry Walls – Coordinate installation of frames to allow for solidly filling space3 between frames and masonry with grout.
 - 7. Install fire-rated frames according to NFPA 80.
 - C. Door Installation -Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.
- 3.2 ADJUSTING AND CLEANING
- A. Prime Coat Touchup - Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
 - B. Final Adjustments: Check and adjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
 - C. Protection Removal - Immediately before final inspection, remove protective wrappings from doors ,frames, and hardware.

END OF SECTION 08110

DIVISION 8 - DOORS- AND WINDOWS

SECTION 08710: FINISH HARDWARE

1.0 GENERAL

1.1 SUMMARY

A. Work included:

1. Furnish hardware required to complete the work as shown on the drawings and as specified herein;
2. Furnish trim attachments and fastenings, specified or otherwise required, for proper and complete installation.
3. Deliver to the job site those items of finish hardware scheduled to be installed at the job site; and delivered to other points of installation those items of finish hardware scheduled to be factory installed, including:
 - a. Butt Hinges
 - b. Lock cylinders and keys
 - c. Lock and latch sets
 - d. Exit devices
 - e. Electric Strikes & Power Supplies
 - f. Closers
 - g. Miscellaneous door control devices
 - h. Protection plates
 - i. Security products
 - j. Wall or floor stops
4. **See Sheet 2 of 3 for Hardware Sets required.**

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 08100: Metal doors and frames
3. Division 16: Electrical

1.2 REFERENCES

- A. Michigan Building Code – 2006 Edition
- C. American National Standards Institute (ANSI):
 1. ANSI A 156 Standards series.
- D. National Electric Code – 2006 Edition

1.3 DEFINITIONS

- A. "Finish Hardware": Items required for swinging, doors, except special types of unique and non-matching hardware specified under door and frame Sections of these Specifications.

1.4 SYSTEM DESCRIPTION

A. Design requirements:

1. Review of hardware requirements:
 - a. Thoroughly review finish hardware schedule, comparing it with the floor plan, door

- schedule, and door details to verify hardware requirements, quantities, door swings, finishes, and sizes.
- b. If an inconsistency or error in the proposed construction documents is suspected, the hardware supplier is to bring it immediately to the attention of the DMVA Designer. If the quantity of items is questioned, for bidding purposes, assume the higher quantity is required and price accordingly.
 - c. DMVA Designer’s review of Submittals is for design concept only, and does not relieve the Contractor of the responsibility to furnish sufficient material and functions required for a complete, and code-worthy installation. Determination of all quantities is the responsibility of the Contractor.
- B. Performance requirements:
1. Furnish finish hardware complying with the requirements of laws, codes, ordinances and guidelines of governmental authorities having jurisdiction:
 - a. NFPA 101, “Life Safety Code”, 2000 edition
 - b. Michigan Building Code - 2006 Edition
- 1.2 SUBMITTALS
- A. Comply with pertinent provisions of Section 01330 SUBMITTALS.
- B. Product data:
1. Initial submittal of the proposed "Finish Hardware Schedule" in the following format:
 - a. Vertically-typed, double-spaced;
 - b. Organized into "hardware sets", indicating complete designations of every item required for each door or opening. Include the following information for each item of finish hardware:
 - (1) Manufacturer
 - (2) Type
 - (3) Style
 - (4) Function
 - (5) Size
 - (6) Degree and direction of opening swing (“hand”)
 - (7) Finish
 - (8) Fasteners
 - (9) Location of hardware set cross-referenced to indications on floor plans, door, schedule, and frame schedule and hardware schedule
 - (10) Explanation of all abbreviations, symbols, codes, etc. contained in schedule.
 - (11) Mounting heights and locations for hardware.
 - (12) Door and frame sizes and materials.
 - (13) Keying information.
 2. Final Finish Hardware Schedule immediately following receipt of the DMVA Designer’s approval of the initial submittal.
- C. Templates: Furnish hardware templates with final submittal of Finish Hardware Schedule.
- D. Contract closeout submittals:
1. Operation and maintenance data: Comply with pertinent provisions of Section 01730.
 2. Provide two complete sets of finish hardware schedules, and two complete copies of manufacturer's catalog cuts and maintenance instructions for each item furnished under the Work of this Section.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the requirements and the methods needed for proper performance of the work of this Section.
- B. Supplier qualifications:
 - 1. Continuously in business of finish hardware supply for not less than 5 years.
- C. Certified RPI service contract.
 - 1. Hardware supplier shall provide a RPI Service contract, contract to include:
 - a. Inspection of installation of all finish hardware items.
 - b. Final Closer Adjustment.
 - c. One year inspection.
- D. Installer qualifications: Employ a competent hardware installer with at least five (5) years experience installing commercial grade hardware.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01620.
- B. Product identification:
 - 1. Tag and mark each item separately in manufacturers unopened package, identifying it by product number and DMVA Designer architectural opening number, as listed in the approved Finish Hardware Schedule.
 - 2. Include instructions, templates, and fasteners needed for installation.
- C. Deliver individually packaged hardware items on a vehicle operated by a direct employee of the Hardware Supplier. Contractor shall immediately, and in the presence of the Hardware Supplier, inventory the contents of the delivery.
- D. Hardware supplier: Furnish finish hardware items directly to the factory or mill for factory-installation, where required.

1.5 PROJECT CONDITIONS

- A. Provide a secure, dry storage area for the sole purpose of storing finish hardware. Prohibit access to all jobsite personnel, except those employed by the installing contractor.

1.6 WARRANTY

- A. Manufacturer's warranty:
 - 1. Warrant all finish hardware items against defects in materials and workmanship for one year.
 - 2. Extended warranty: Extend the above warranty on certain items of finish hardware as follows:
 - a. Door closers: To ten years
 - b. Exit devices: To five years
 - c. Locks and latch sets: To five years
 - 3. Manufacturer agrees to promptly replace (including installation by a factory representative) defective products at no additional cost to the Owner, for the duration of the warranty period.

4. The terms of such warranties extend from the Date of Substantial Completion as that date is defined by the General Conditions.
- B. Failures due to defective materials or workmanship is deemed to include, but not to be limited to:
1. Failures in operation of any operating component;
 2. Defects which contribute to unsightly appearance, potential safety hazard, or potential untimely failure of the products furnished under this Section.

2.0 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each finish hardware item is indicated in the Finish Hardware Schedule on Sheet 1 of 5.
- B. Product designations:
1. Manufacturers are listed for each hardware type required. These products are to be supplied as specified.
- C. ANSI/BHMA designations:
1. Used to describe hardware items, or to define quality or function. Provide products complying with these standards in addition to additional requirements of this Section.
- D. Hand of door: Drawings show swing (“hand”) of door leaves.
- E. Hardware: Use hardware manufactured to conform to published templates and, generally, prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

2.2 MATERIALS

- A. Base metals:
1. Manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially-recognized) quality than that specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated.
 2. Do not furnish "optional" materials for those indicated, except as otherwise specified.
- B. Fasteners:
1. Furnish Phillips flat-head screws with each hardware item, unless otherwise indicated.
 2. Exposed screws: Match finish of hardware (even where noted to be "prepared for paint").
 3. Use concealed fasteners for hardware units which are exposed when door is closed, except where no standard units of type specified are available with concealed fasteners.
 4. Do not use thru-bolts where bolt head or nut on opposite face would be exposed.
 5. Where adequate reinforcement is not feasible, thru-bolting would only be acceptable if through sleeves, or if sex-screw fasteners are used.
- C. Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.3 MANUFACTURED UNITS, GENERAL

A. Reference standards:

<u>Item:</u>	<u>Comply with:</u>
1. Butts and hinges:	ANSI A156.1-1988 (BHMA 101)
2. Locks and lock trim:	ANSI A156.2-1987 (BHMA 601)
3. Exit devices:	ANSI A156.3-1989, Grade 1 BHMA 701)
4. Door controls-closers:	ANSI A156.4-1986, Grade 1 BHMA 301)
5. Architectural door trim:	ANSI A156.6 (BHMA 1001)
6. Temple hinge dimensions:	ANSI A156.7
7. Door controls-overhead holders:	ANSI A156.8 (BHMA 311)
8. Mortise locks and latches:	ANSI A156.13-1987, Grade 1
9. Auxiliary hardware:	ANSI A156.16-1989(BHMA 1201)

B. Hardware finishes:

1. Materials and Finishes Standard: Comply with ANSI A156.18 (BHMA 1301). Finish designations used in schedules are listed, therein.
2. Provide US32D or US26D at all finish hardware exposed to view.
3. Provide matching finishes for hardware units at each door, unless otherwise indicated.
4. Match the color and texture of hardware items to manufacturer's standard finish for the latchset, lockset .
5. Provide quality of finish, including thickness of plating or coating, composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than that specified or described by referenced standards **and to match similar existing hardware at Project site.**

2.4 PRODUCTS

A. Hinges, butts and pivots:

1. General:
 - a. ANSI A156.1 - 1988 for commercial quality.
 - b. Provide only template-produced units.
 - c. All hinges to be concealed bearing-type.
 - d. Hinges at exterior doors shall be of non-ferrous material.
2. Screws:
 - a. At metal doors and frames: Machine screws.
 - b. At wood doors and frames: Phillips flat-head wood screws.
 - c. Finish screw heads to match surface of hinges or pivots.
3. Pins:
 - a. Steel hinges: Steel
 - b. Non-ferrous hinges: Stainless Steel
 - c. Hinges at out-swing corridor doors: Non-removable (NRP)
 - e. Hinges at interior doors: Non-rising
4. Tips:
 - a. Flat button with matching plug
 - b. Finish to match leaves, except where hospital tip (HT) indicated.
5. Number of hinges: Provide number of hinges indicated but not less than 3 hinges.
6. Hinge sizing:
 - a. According to hinge manufacturer's recommendation for door size and weight, unless otherwise specified.
 - b. Hinges for door widths 3 feet, or less: Standard-weight (.134)
 - c. Hinges for door widths over 3 feet: Heavy-weight (.180) hinges
7. Acceptable products:

- a. For interior/exterior standard weight hinges:
 - (1) Stanley CB179/CB191
 - (2) Hager AB700/AB800

- B. Lock Cores and Keying:
 - 1. Cores and keys to be furnished by owner.

- ^D. Locksets:
 - 1. Cylindrical Locks
 - a. Comply with ANSI A156.2 –Series 4000, Grade 1 criteria for cylindrical locks
 - b. Function: Indicated in the hardware sets.
 - c. Provide appropriate fasteners for lock and strike.
 - d. Trim: 15D lever-type equal to Best Lock
 - e. Acceptable products: BEST 9K series
 - f. Electrified locks to be furnished as 24VDC Fail secure with RQE

- E. Exit devices:
 - 1. General:
 - a. Comply with ANSI A156.3, Grade 1, Types 1, 4, and 28 criteria for products supplied.
 - Type: Flat, stainless steel push-bar, rail and covers with cylinder-dogging and dead-locking latch bolts.
 - 2. Provide rubber (non oil-filled) noise dampeners for push-pad noise dampening.
 - 3. Function:
 - a. Indicated in the hardware sets.
 - b. Provide all cylinder functions at electrically-operated exit devices, including cylinder dogging.
 - c. Provide latch and push-pad status switches as specified.
 - 4. Trim: Extra-heavy-duty, vandal-resistant, compression clutch lever matching the lockset. Break-away trim is not acceptable.
 - 5. Acceptable products:
 - a. Precision Apex 2000 series x V4900 series

- H. Kick plates, mop plates and armor plates:
 - 1. General: ANSI A156.16 - 1989 criteria.
 - 2. Description:
 - a. Minimum .050" thick.
 - b. Dimensions:
 - (1) Width: 1-1/2" less than door width to which they are to be applied.
 - (2) Kick plate height: 10"
 - (3) Armor plates: 48" for non-labeled doors, unless scheduled otherwise.
 - 3. Mounting:
 - a. **Install kick plates and armor plates flush to bottom edge of door.**
 - b. Notch armor plates for lock or exit device trim or active case.
 - c. When armor plate is used on doors with touch bar type exit devices, determine height of plate by measuring from bottom of door to 1" below bottom of touch bar, and notch for active case.
 - 4. Acceptable manufacturers:
 - a. Rockwood
 - b. Baldwin

- I. Stops:
 - 1. General:
 - a. ANSI A156.16 - 1989 Grade 1 criteria.
 - b. Provide stops where scheduled, wall or floor, as opening conditions dictate, utilizing wall stops wherever possible.
 - 2. Description:
 - a. Wall stops: Wrought brass, bronze or stainless steel
 - 3. Acceptable products:
 - a. Rockwood 409/442/ 487

2.5 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the DMVA Designer.

2.6 HARDWARE FINISHES

- A. General:
 - 1. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible and except as otherwise indicated.
 - 2. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening.
 - 3. In general, match items to the manufacturer's standard finish for the latch and lock set (or push/pull units if no latch/lock sets) for color and texture.
 - 4. Provide finishes matching those established by BHMA or, if none established, match the DMVA Designer's sample.
 - 5. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than that specified for the applicable units of hardware by referenced standards.
 - 6. Finish designations used in schedules and elsewhere listed in ANSI A156.18 "Materials and Finishes Standard", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products.

- B. Provide the following hardware finishes, unless otherwise scheduled:

- | | |
|-------------------------|--|
| 1. Hinge | US26D - Satin Chrome or
US32D - Satin Stainless Steel |
| 2. Exit device | US32D - Satin Stainless Steel |
| 3. Lock | US26D - Satin Chrome |
| 4. Cylinder | To match surrounding hardware |
| 5. Closer | AL - Sprayed Aluminum |
| 6. Push/pull bar | US32D - Satin Stainless Steel |
| 7. Kick/mop/armor plate | US32D - Satin Stainless Steel |
| 8. Wall stops | US32D - Satin Stainless Steel |
| 9. Floor stops | US26D - Satin Chrome |

- C. Base material: Manufacturer’s standard high-carbon steel, brass, or bronze.

- D. Hardware Set No.1 – Office

Hinges	3 ea. TA2714 4 ½ x 4 ½ NRP	26D
Lockset	1 ea. Match existing Russwin Corbin lever	26D
Kick Plate	1 ea. 12” x 1 ½” LDW x .050	32D

Stop

1 ea. Wall 409

32D

3.0 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION

A. General:

1. Install each item in its proper location firmly anchored into position, level and plumb, and in accordance with the manufacturer's recommendations.
2. Handing, hardware heights, locations, and degree of opening swing are indicated in the Drawings and Finish Hardware Schedule.
3. Mount finish hardware units:
 - a. At recommended heights and locations as shown in approved finish hardware schedule, complying with requirements of the A.D.A., and pertinent provisions of the Building Code.
 - b. To function at proper degree of opening of doors as indicated on approved finish hardware schedule.
 - c. By manufacturer's template.
 - d. Prior to final finishing of the door. Remove hardware to allow finishing of door, and permanently reinstall hardware upon completion of finishing operation.
3. Reinforce, where necessary, the substrate to assure proper attachment.
4. Drill and countersink units which are not factory-prepared for anchorage fasteners.
5. Space fasteners and anchors in accordance with industry standards.

B. Installing closers:

1. Mount closers per manufacturer's template, and secure the DMVA Designer's approval of the closer installation.
2. The Contractor will be required to **REPLACE** doors onto which closers are improperly mounted at no additional cost to the Owner. Repair or patching of such doors will not be acceptable.

- C. Installing thresholds at exterior doors: Set in full bed of butyl-rubber, or polyisobutylene mastic sealant.

3.4 FIELD QUALITY CONTROL

- A. Inspection of final hardware installation: The Contractor, hardware suppliers, and DMVA Designer Architectural Hardware Consultant (AHC) shall thoroughly check the quality of the installation and the functionality of each unit of finish hardware at all openings in the Work. The Hardware Supplier shall forward a detailed written report of all operational or installation deficiencies to the DMVA Designer and Contractor.

3.5 CLEANING AND ADJUSTING

- A. Check and adjust each item of hardware and each door upon completion of final installation. Verify proper function, and replace units which cannot be made to operate freely and smoothly, as intended for the application.
- B. Clean adjacent surfaces soiled by hardware installation.

END OF SECTION 08710

DIVISION 09 - FINISHES**09111 NON-LOAD-BEARING STEEL FRAMING****1.0 DESCRIPTION**

- A. Provide non-load-bearing steel framing members for the following applications:
 - 1. Modifying existing Interior framing systems (e.g., supports for partition walls).
 - 2. Cutting and framing new openings in existing interior framing with or without finish surfaces, and repairing existing finish surfaces.

1.1 SUBMITTALS

- A. Product Data - For each type of product indicated.

1.2 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics - For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies - For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.0 PRODUCTS**2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL**

- A. Framing Members, General - Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components - Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 2. Protective Coating - ASTM A 653/A 653M, Coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40, hot-dip galvanized, unless otherwise indicated.

2.2 STEEL FRAMING FOR FRAMED ASSEMBLIES

- A. Steel Studs and Runners - ASTM C 645.
 - 1. Minimum Base-Metal Thickness - 0.0312 inch.
 - 2. Depth: 3-5/8 inches ST20 with runners top and bottom..
- B. Slip-Type Head Joints - Where indicated, provide one of the following:
 - 1. Single Long-Leg Runner System - ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 - 2. Double-Runner System - ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
 - 3. Deflection Track - Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

2.3 AUXILIARY MATERIALS

- A. General - Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing - Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, and structural framing, for compliance with requirements and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Installation Standard - ASTM C 754, except comply with framing sizes and spacing indicated.
 1. Gypsum Board Assemblies - Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- B. Install studs so flanges within framing system point in same direction.
 1. Space studs as follows:
 - a. Single-Layer and Multilayer Application: 16 inches o.c., unless otherwise indicated.
- C. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.
 1. Slip-Type Head Joints - Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings - Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings - Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Sound-Rated Partitions - Install framing to comply with sound-rated assembly indicated.

END OF SECTION 09111

DIVISION 9 - FINISHES**09250 GYPSUM BOARD****1.0 DESCRIPTION**

- A. Provide gypsum board assemblies indicated.
 - 1. Interior gypsum board.
 - 2. Backing Panels

1.1 SUBMITTALS

- A. Product Data - For each type product indicated.

1.2 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies- For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing.

1.3 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations – Comply with ASTM C 840 requirements or gypsum board manufacturer’s written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

2.0 PRODUCTS**2.1 PANELS, GENERAL**

- A. Size – Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. General – complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
 - 1. Available Manufacturers - Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - a. American Gypsum Co.
 - b. BPB America Inc.
 - c. G-P Gypsum
 - d. Lafarge North America Inc.

- e. National Gypsum Company
- f. PABCO Gypsum
- g. Temple
- e. USG Corporation

B. Type X:

- a. Thickness - 5/8 inch.
- b. Long Edges – Tapered.

C. Abuse-Resistant Type – Manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular, and Type X gypsum board.

- 1. Core – (As indicated All single-layer applications 5/8” Type X.
- 2. Long Edges - (Tapered).

D. Sound Deadening Type

- 1. Core – **5/8 assembly consisting of a layer of viscoelastic damping polymer sandwiched between two pieces of enhanced high density mold resistant gypsum board providing constrained layer damping, Gold Bond brand “SoundBreak”by National Gypsum**

2.3 TRIM ACCESSORIES

A. Interior Trim – ASTM C 1047.

- 1. Material – Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
- 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead – J-shaped; exposed long flange receives joint compound.
 - d. L-Bead – L-shaped; exposed long flange receives joint compound.
 - e. U-Bead – J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.
 - g. Curved-Edge Cornerbead – With notched or flexible flanges.

2.4 JOINT TREATMENT MATERIALS

A. General – Comply with ASTM C 475/C 475M.

B. Joint Tape:

- 1. Interior Gypsum Wallboard – Paper.

C. Joint Compound for Interior Gypsum Wallboard – For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

- 1. Prefilling - At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
- 2. Embedding and First Coat - For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
- 3. Fill Coat - For second coat, use drying-type, all-purpose compound.
- 4. Finish Coat - For third coat, use drying-type, all-purpose compound.
- 5. Skim Coat - For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General - Provide auxiliary materials that comply with referenced installation standards and

manufacturer's written recommendations.

B. Steel Drill Screws – ASTM C 1002.

1. On metal framing, fasten board and channels using flat-head screws, shouldered, specially designed for use with power-driven tools, not less than 1" long, with self-tapping threads and self-drilling points.
 - a. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033" to 0.112" thick.

C. Sound Attenuation Blankets – ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool; **install in all partitions.**

1. Fire-Resistance Rated Assemblies – comply with mineral-fiber requirements of assembly.

D. Acoustical Sealants

1. Exposed and Concealed Joints – Nonsag, paintable, nonstaining latex sealant complying, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK acoustical sealant.
2. Concealed Joints – Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.
 - a. Ohio Sealants, Inc.; Pro-Series SC-170 rubber Base Sound Sealant.
 - b. Pecora Corp.; BA-98.
 - c. Tremco, Inc.; Tremco Acoustical Sealant.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16" of open space between panels. Do not force into place.
- C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than

control joints at corners of framed openings.

- D. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect open structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow ¼” to 3/8” wide joints to install fire and/or acoustical sealants.
- E. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide ¼” to ½” wide spaces at these locations, and trim edges with edge trim where edges of gypsum panels are exposed. Seal joints between edges and butting structural surfaces with either acoustical or fire-resistant sealant, as required by assembly rating.
- F. Attachment to Steel Framing – Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X – Corridor fire partition three-layer application.
 - 3. Type C – or Type X for all single-layer applications.
 - 4. High-Impact Type – All single-layer applications.
- B. Single-Layer Application with sound attenuation insulation to all partitions except hallway fire partition.
 - 1. Fastening Methods – Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application on Entry/Hallway fire-rated partition meeting UL U465 construction and STC 57 rating with SoundBreak inner layer; see Drawing details.

3.4 INSTALLING TRIM ACCESSORIES

- A. General – For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer’s written instructions.
 - 1. Drawings do not purport to show all metal trim required; verify precise locations and types of trim to be used.
- B. Interior Trim - Install in the following locations:
 - 1. Cornerbead - Use at outside corners, unless otherwise indicated.
 - 2. Bullnose Bead - Use at outside corners.
 - 3. LC-Bead - Use at exposed panel edges.
 - 4. L-Bead - Use [where indicated]
 - 5. U-Bead - Use at exposed panel edges where indicated.

3.5 FINISHING GYPSUM BOARD

- A. General - Apply joint treatment at gypsum board joints; flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to obtain indicated finish. Promptly remove residual joint compound from adjacent surfaces.
- B. Embedding & First Coat - Ready-mix drying-type all-purpose or taping compound.

1. Spread compound evenly over joints, using tools designed for purpose.
2. Fill joint recesses and metal trim.
3. Center tape on joint and press into fresh compound, wiping down with sufficient pressure to remove excess compound but leaving sufficient compound under tape for proper bond.
4. Feather edges and leave surface free from blisters and tape wrinkles.
5. Apply compound to fastener recesses, leaving flush with adjacent surfaces.
6. Fold reinforcing tape along its centerline and apply to interior angles following same procedure as for joints.

C. Second Coat - Ready-mix drying-type all-purpose or topping compound.

1. Lightly sand dry compound with fine sandpaper to remove irregularities.
2. Apply a second coat of compound to joints, feathering three inches beyond edges of tape.
3. Apply second coat to fastener recesses; allow to dry.

D. Third Coat - Ready-mix drying-type all-purpose or topping compound.

1. Lightly sand dry compound with fine sandpaper to remove irregularities.
2. Apply final skim coat, feathering out two inches beyond second coat.
3. Third coat fasteners, metal trim, and interior angles; allow to dry.

E. Partial Finishing - Omit third coat and sanding on concealed drywall construction which requires finishing to achieve fire-resistance rating, sound rating, or to act as air or smoke barrier.

F. Gypsum Finish Levels – Finish panels to levels indicated, to ASTM C 840, for locations indicated:

1. Level 1 – Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies.
2. Level 4 – Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.

3.6 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09250

DIVISION 9 - FINISHES

09511 ACOUSTICAL PANEL CEILINGS, METAL GRID

1.0 DESCRIPTION

- A. Provide acoustical panels and exposed metal grid suspension system ceiling(s) indicated.

1.1 SUBMITTALS

- A. Product Data - For each type of product indicated.
- B. Coordination Drawings - Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items; Show the following:
 - 1. Ceiling suspension system members.
 - 2. Method of attaching hangers to building structure.
 - 3. Ceiling-mounted items including light fixtures; air outlets and inlets, speakers, sprinklers; and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
 - 4. Minimum Drawing Scale - 1/8" = 1'-0"
- C. Product Test Reports - Indicate compliance of acoustical panel ceilings and components with requirements based on comprehensive testing of current products.
- D. Research/Evaluation Reports - Evidence of acoustical panel ceiling components' comply with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.2 QUALITY ASSURANCE

- A. Installer Qualifications
 - 1. Engage an experienced Installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fire-Test-Response Characteristics - Provide acoustical panel ceilings that comply with the following:
 - 1. Fire-Resistance Characteristics – Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-Resistance Ratings – Indicated by design designations from UL’s “Fire Resistance Directory” or from the listings of another testing and inspecting agency.
 - b. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 2. Surface-Burning Characteristics - Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
 - a. Flame-Spread Index – 25 or less.
 - b. Smoke Developed Index – 450 or less.
- C. REFERENCES
 - 1. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 2. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

3. ASTM E1264 - Classification of Acoustical Ceiling Products.
4. UL - Fire Resistance Directory and Building Material Directory.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.4 PROJECT CONDITIONS

- A. Environmental limitations - Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is completed and dry, work above ceilings is complete, and ambient temperature and humidity conditions are being maintained at the levels indicated for Project when occupied for its intended use.

1.5 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components, and partition assemblies.

1.6 EXTRA MATERIALS - Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1. Acoustical Ceiling Panels - Furnish quantity of full-size units equal to 2% of amount installed.
2. Suspension System Components - Furnish quantity of each exposed component equal to 2% of amount installed.

2.0 PRODUCTS

2.1 METAL SUSPENSION SYSTEM(S) - Provide manufacturer's standard direct-hung metal suspension system(s) of type(s), structural classifications(s), and finish(es) indicated that comply with applicable ASTM C 635 requirements.

- A. Finishes and Colors - Comply with NAAMM's "Metal Finishes Manual for DMVA Designerural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- B. Attachment Devices - Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung. Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with a capability to sustain, without failure, loading equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
- C. Wire Hangers, Braces, and Ties - Provide wires complying with following:
 1. Zinc-Coated Carbon-Steel Wire - ASTM A 641, Class 1 zinc coating, soft temper.
 2. Size - Select wire diameter so it's stress at 3 times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106" diameter.

- D. Sheet-Metal Edge Moldings and Trim - Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.
 - 1. Circular Penetrations - Provide edge molding fabricated to diameter required to fit penetration exactly.
- E. System shall be complete with supporting members, anchors, wall cornices, and adapters for light fixtures, plus incidental accessories required for a complete installation.

2.2 LAY-IN PANELS

- A. Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances.
- B. Panels shall be an approved equal to one of the following:
 - 1. U.S. Gypsum - "Acoustone F"
 - 2. Conweb - "Natural Fissured"
 - 3. Armstrong - "Travertone Fissured"
 - 4. Gold Bond - "Solitude Fissured"
 - 5. Existing Ceilings with missing panels – Replace with matching panels.
- C. Lay-in panels shall be the product of one manufacturer, nominally sized 24" by 48" by 5/8" or 3/4" but properly dimensioned to fit the grid pattern shown on the drawing, shall have a minimum Noise Reduction Coefficient (NRC) of .60, and a flame spread index of 0-25 in accordance with Class I requirements of Federal Specification SS-S-118a.

2.3 ACOUSTICAL SEALANT

- A. Available Products – Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK acoustical sealant.
 - 2. Acoustical Sealant for Concealed Joints:
 - a. Ohio Sealants, Inc.; Pro-Series SC-170 rubber Base Sound Sealant.
 - b. Pecora Corp.; BA-98.
 - c. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints – Nonsag, paintable, nonstaining latex sealant complying, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

- 2.4 OTHER MATERIALS not specifically described but required for a complete and proper installation of the suspended acoustical ceiling, shall be as selected by the Contractor subject to the approval of the DMVA.

3.0 EXECUTION

3.1 EXAMINATION

- A. Carefully inspect installed work of other trades and verify such work is complete to the point where this installation may properly commence.
- B. Verify suspended acoustical ceiling may be installed in accordance with the original design and the approved shop drawings.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Measure each ceiling area and establish layout of acoustical panel to balance border widths at opposite edges of each ceiling. Avoid using less than half width panels at borders, and comply with layout shown on reflected ceiling plans.

3.2 INSTALLATION

- A. Install ceiling(s) per manufacturer's written instructions, CISCA's "Ceiling Systems Handbook," and standard for ceiling suspension system installation complying with ASTM C 636.
- B. Erect metal "T" members in pattern shown on drawings, spacing members symmetrically about centerline of areas in both directions.
- C. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperature.
 - 5. Do not attach hangers to steel deck tabs or to steel roof deck. Attach hangers to structural members.
 - 6. Space hangers not more than 48" o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8" from ends of each member.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Screw attach moldings to substrate at intervals not more than 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to a tolerance of 1/8" in 12'. Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- F. Space cross "T" members as shown on the drawings and secure to main runners and wall angles in accordance with approved shop drawings.

- G. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans or, if not indicated with pattern running in one direction parallel to long axis of space.
 - 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
 - 3. Paint cut panel edges remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 - 4. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions.

- 3.3 CLEAN exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspensions system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09511

DIVISION 9 - FINISHES

09653 - RESILIENT WALL BASE AND ACCESSORIES

1.0 DESCRIPTION

- A. Provide resilient wall base and accessories indicated.
 - 1. Resilient Wall base.

1.1 SUBMITTALS

- A. Product data for each product indicated.

1.2 PROJECT CONDITIONS

- A. Maintain temperature within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient wall base and accessories.
- B. After installation, maintain temperature with range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

1.3 SEQUENCING AND SCHEDULING - Sequence installing products specified in this section with other construction to minimize possibility of damage and soiling during remainder of construction period.

2.0 PRODUCTS

2.1 RESILIENT WALL BASE

- A. Vinyl Wall Base - Products complying with FS SS-W-40A, Type II; Class 1, style A & B; minimum thickness 1/8", height of 4", premolded for formed on job exterior corners, premolded or formed on job interior corners, smooth surface, color and pattern as selected by DMVA.
 - 1. Manufacturers:
 - a. Mercer.
 - b. Roppe.

2.2 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer - Nonstaining type as recommended by flooring manufacturer.
- B. Trowelable Underlayments and Patching Compounds - Latex-modified, Portland-cement-based formulation provided or approved by tile manufacturer for applications indicated.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Cove Base Adhesives: Not more than 50 g/L.

- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - 4. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 **CLEANING AND PROTECTION**

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END

OF

SECTION

09653

DIVISION 9 - FINISHES

09900 PAINTING

1.0 DESCRIPTION

- A. Provide surface preparation and field- or shop-painting indicated.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
 - 2. Paint exposed surfaces, except where it is indicated that a surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically indicated to be excluded from painting, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, DMVA will select from standard colors and finishes available.
 - 3. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

- B. Do not paint finish painted items, finished metal surfaces, concealed structural surfaces, operating parts, and labels.
 - 1. Prefinished items include the following factory-finished components:
 - a. Finished mechanical and electrical equipment.
 - b. Light fixtures.
 - 2. Finished metal surfaces include the following
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plates.
 - d. Copper and copper alloys.
 - e. Bronze and brass.
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
 - e. Finish hardware.
 - 3. Labels – Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature.

1.1 SUBMITTALS

- A. Product data for each paint system specified.

- B. Material List - Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classifications.

- C. Manufacturer's Information - Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

- D. Material Safety Data Sheets (MSDS's) - Submit one copy for each paint type. MSDS's do not constitute and are in addition to above paragraphs "A", "B", or "C" shop drawing submittals. **MSDS's must be on site during paint application.**

1.2 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project Site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.3 PROJECT CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F and 90 deg F.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

1.4 EXTRA STOCK

- A. Upon completion of work, delivery to Owner an extra stock of paint equaling 5%, but not less than one gallon, of each color used in each coating material used, with such extra stock tightly sealed in clearly labeled containers.

2.0 PRODUCTS

2.1 PAINT MATERIALS

- A. Material Compatibility – Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based testing and field experience.
- B. Material Quality – Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names – Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the

exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Manufacturer - Equivalent products of major paint manufacturers may be used subject to review and approval.

1. When submitting equivalent products by other manufacturers, Contractor retains responsibility for compatibility and the quality, durability, and integrity of the end product of applied products.

2.2 SCHEDULE OF PAINTING AND FINISHING - Except as specifically noted, Sherwin-Williams was selected as **Basis-of-Design**

A. Interior Painting

Finish 1

First Coat

Second Coat

Third Coat

New Gypsum Board (Walls)

Prep Rite 200 Latex Primer

Pro-Mar 200 Latex Egg shell

Pro-Mar 200 Latex Egg Shell

Finish 2

First Coat

Second Coat

Third Coat

Interior Hollow Metal Doors & Frames, shop primed steel, i.e., structural framing, lintels, structural steel.

Acrylic Prime/Finish Touch-Up

Pro-Mar 200 Latex Gloss Enamel

Pro-Mar 200 Latex Gloss Enamel

3.0 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work – Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify DMVA about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General – Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning – Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process

will not fall on wet, newly painted surfaces.

- C. Surface Preparation – Clean and prepare surfaces to be painted according to manufacturer’s written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
 2. Cementitious Materials – Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panels surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Clean concrete floors to be painted with a 5% solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 3. Ferrous Metals – Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC’s recommendations.
 - a. Clean steel surfaces as recommended by paint system manufacturer and, depending on surface conditions, according to a combination of **SSPC-SP No. 2** Thorough Hand Tool Cleaning, **SSPC-SP No. 3** Thorough Power Tool Cleaning, or **SSPC-SP No. 7** Brush Off Blast Cleaning.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
 4. Galvanized Surfaces – Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Paint Material Preparation – Mix and prepare paint materials according to manufacturer’s written instructions.
1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- E. Tinting – Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.
- F. Masonry Surface Repairs to include large cracks, holes, and voids shall be filled with a cement mix patching compound. Open joints shall be pointed full and tooled to match adjacent existing joints. Cracks between 1/16" and 1/8" shall be veed prior to filling. Cracks over 1/8" shall be filled and struck off flush with surface. Also see Section MASONRY RESTORATION.
- G. Deglossing of surface glaze remaining on existing coatings shall be removed either by lightly sandpapering the surface or through the use of a chemical deglosser.
- H. Smoothing

1. Unless specifically noted to be left rough, smooth finished wood surfaces exposed to view, using proper sandpaper.
2. Where required, use varying sizes of sandpaper grit to produce uniformly smooth and unmarred wood surfaces.

3.3 APPLICATION

- A. General – Apply paint according to manufacturer’s written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paints, surface treatments, and finishes are indicated in the SCHEDULE OF PAINTING AND FINISHING in this Section and in the ROOM FINISH SCHEDULE on the Drawing Sheet A-9.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, grilles, convectors covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 8. Finish doors on tops, bottoms, and side edges the same as both exterior faces.
 9. Finish interior of wall and similar field-finished casework to match exterior.
 10. Sand lightly between each succeeding enamel coat.
- B. Scheduling Painting – Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer’s written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures – Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer’s written instructions.
1. Brushes – Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item, being painted.
 2. Rollers – Use rollers of carpet, velvet-back, or high-pile sheep’s wool as recommended by manufacturer for material and texture required.

3. Spray Equipment – Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
 - D. Minimum Coating Thickness – Apply paint materials no thinner than manufacturer’s recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
 - E. Mechanical and Electrical Work – Painting of mechanical and electrical work is limited to items exposed in occupied spaces.
 - F. Block Fillers – Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
 - G. Prime Coats – Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
 - H. Pigmented (Opaque) Finishes – Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
 - I. Completed Work – Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.
- 3.4 INSTALLATION OF REMOVED ITEMS - Following final painting and proper drying of each space or surface area, promptly install items removed for painting. Items lost shall be replaced at Contractor's expense.
- 3.5 CLEANING
- A. Trash Removal.
 1. Debris, rubble, and trash, including such material as broken glass, empty paint containers, cartons, and dirty rags or waste shall be removed from the contract areas each work day.
 2. Accumulations will not be permitted.
 - B. Cleanup.
 1. Upon completion of the work, staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner.
 2. Paint spots, oil, or stains on adjacent surfaces, including glass, shall be removed whether they resulted from work performed under this contract or had previously existed.
 3. All refuse shall be swept from floors and decks with the entire job left clean and habitable.
- 3.6 PROTECTION
- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by DMVA.
 - B. Provide “Wet Paint” signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09900

DIVISION 10 - SPECIALTIES**10431 SIGNS****1.0 DESCRIPTION**

- A. Provide signs indicated.
 - 1. Engraved room signs.

1.1 SUBMITTALS

- A. Product Data – For each type product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include manufacturer’s written instructions for maintaining and cleaning sign surfaces.

2.0 PRODUCTS**2.1 IDENTIFYING DEVICES**

- A. Room Identifying Signs
 - 1. Engraved, unframed, signs of acrylic or ABS plastic with edges mechanically and smoothly finished as either beveled or bull nose. Edge color for plastic laminate may be either same as copy or same as background. Corners shall be square. Engrave through the exposed face ply of the plastic laminate sheet to expose the contrasting core ply. Face ply shall be wood grain, core ply shall be white.
 - 2. Minimum single-line sign size shall be 2" high x 12" wide with text centered for names; for numbers, 2" x 6" with number centered; for double-lines 3-1/2" high x 12" wide with text and numbers centered. No abbreviations will be allowed.
 - 3. Rooms shall be identified by Room Name and Room Number, with 1" letters for each room:
 - a. Each interior hinged door shall be labeled.

3.0 EXECUTION**3.1 INSTALLATION**

- A. Install signs level, plumb, and at height indicated, with surfaces free from distortion or other defects in appearance.

3.2 ROOM IDENTIFYING SIGNS

- A. Locate Sign Units centered in each door at a height of 5'8" above finish floor (AFF), using mounting method of type described and in compliance with the manufacturer's instructions.
- B. Install signs level and plumb, with sign surfaces free from distortion or other defects in appearance.
- C. Install signs to doors using liquid silicone adhesive recommended. Use double-sided vinyl tape to hold the sign in place until the adhesive has fully cured.

- 3.3 CLEANING – After installation, clean soil from sign surfaces according to manufacturer’s written instructions.

END OF SECTION 10431

DIVISION 10 - SPECIALTIES**10605 WIRE MESH PARTITIONS****1.0 DESCRIPTION**

- A. Provide wire mesh fabrications indicated.

1.2 SUBMITTALS

- A. Product Data – Include construction details, material description, dimensions of individual components and profiles, and finishes for wire mesh items.
- B. Shop Drawings – Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Welding – Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, “Structural Welding Code—Steel.”
 - 2. AWS D1.3, “Structural Welding Code—Sheet Steel.”
- B. Preinstallation Conference – Conduct conference at Project site; include Contractor and Installer.,

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wire mesh items with cardboard protectors on perimeters of panels and doors and with posts wrapped to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Inventory wire mesh partition door hardware on receipt and provide secure lockup for wire mesh partition door hardware delivered to Project site.

1.5 PROJECT CONDITIONS

- A. Field Measurements - Verify dimensions by field measurements before fabrication and show indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Show piping, beam, roof joists, etc. penetrations and method of framing.

1.6 COORDINATION

- A. Coordinate installation of anchorages for wire mesh items supported or anchored to permanent construction. Furnish setting drawings, templates, and directions for installing anchorages, including concrete inserts, anchor bolts, and items with integral anchors, that are to be installed in existing concrete or masonry.

2.0 PRODUCTS**2.1 MANUFACTURERS**

- A. Available Manufacturers – Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Acorn Wire & Iron Works, Inc.
 - 2. California Wire Products Corporation.
 - 3. G-S Company (The)
 - 4. Indiana Wire Products, Inc.
 - 5. Jesco Industries, Inc.
 - 6. King Wire Partitions, Inc.

7. Miller Wire Works, Inc.
8. Newark Wire Works Inc.
9. SpaceGuard Products
10. Standard Wire & Steel Works.
11. Wire Crafters, Inc.

2.2 MATERIALS

- A. Steel Wire – ASTM A 510.
- B. Steel Plates, Channels, Angles, and Bars – ASTM A 36.
- C. Cold-Rolled Steel Sheet – ASTM A 1008, Commercial Steel (CS), Type B.
- D. Steel Pipe – ASTM A 53, Schedule 40, unless another weight is indicated or required by structural loads.
- E. Square Steel Tubing – Cold-formed structural-steel tubing, ASTM A 500.
- F. Panel-to-Panel Fasteners – Manufacturer’s standard steel bolts.

2.3 PAINT

- A. Shop Primer for Ferrous Metal – Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolong exposure.

2.4 STANDARD DUTY WIRE MESH PARTITIONS

- A. Mesh – 0.135” diameter, intermediate-crimp steel wire woven into 1 ½” diamond mesh.
- B. Vertical Panel Framing – 1 ¼” x 5/8” x 0.0966” cold-rolled, C-shaped steel channels with ¼” diameter bolt holes spaced not more than 18” o.c. along center of framing.
- C. Horizontal Panel Framing – 1” x ½” x 1/8” cold-rolled steel channels.
- D. Horizontal Panel Stiffeners – 1” ½” x 1/8” cold-rolled steel channels with wire woven through, or two 1” x 3/8” x 1/8” cold-rolled steel channels bolted or riveted toe to toe through mesh.
- E. Top Capping Bars – 2 ¼” x 1” cold-rolled steel channels.
- F. Posts for 90-Degree Corners – 1 ¼” x 1 ¼” x 1/8” steel angles with ¼” diameter bolt holes in vertical framing; with floor anchor clips.
- G. Posts for Other-Than-90-Degree Corners – Manufacturer’s standard steel pipe or tubing with ¼” diameter bolt holes aligning with bolt holes in vertical framing.
 1. Partitions Up to 12’ High – 1 ¼” OD.
- H. Adjustable Corner Posts – Two, manufacturers standard steel pipe or tubing posts connected by steel hinges at 36” o.c. attached to posts, with ¼” diameter bolt holes aligning with bolt holes in vertical framing.

- I. Line Posts – 3” x 4.1# or 3 ½” x 1 ¼” x 0.1265” steel channels; with 5” x 18” x ¼” steel base plates punched for attachment to floor.
- J. Three- and Four-Way Intersection Posts – 1 ¼” x 1 ¼” tubular steel, with ¼” diameter bolt holes aligned for bolting to adjacent panels.
- K. Floor Shoes – Steel, cast iron, or cast aluminum, 2” high; sized to suit vertical framing, drilled for attachment to floor, and with set screws for leveling adjustment.
- L. Swinging Doors – Fabricated from same mesh as partitions, with framing fabricated from 1 ¼” x ½” x 1/8” steel channels or C-channels, banded with 1 ¼” x 1/8” flat steel bar cover plates on 3 sides, and with 1/8” thick angle strike bar and cover on strike jamb.
 - 1. Hinges – Full-surface, 3” x 3” steel, 1 ½ pair per door; riveted or welded to door and jamb framing.
 - 2. Padlock Lug – Mortised into door framing and enclosed with steel cover.

2.5 ACCESSORIES

- 1. Sheet Metal Base - .05908” thick, cold-rolled steel sheet finished same as partitions.
 - 2. Adjustable Filler Panels – 0.0598” thick, cold-rolled steel sheet; capable of filling openings from 2” to 12”.
 - 3. Wall Clips – Manufacturer’s standard, cold-rolled steel sheet; allowing up to 1” of adjustment.
- A. Finishes for Interior Locations - Baked-enamel finish or Powder-coated finish.
- 1. Color – Gray.

2.6 FABRICATION

- A. General – Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-size components as recommended by wire mesh item manufacturer. Provide bolts, hardware, and accessories as required for complete installation.
- 1. Fabricate wire mesh items to be readily disassembled.
- B. Standard-Duty Wire Mesh Partitions – Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other penetration items. Finish edges of cutouts to provide a neat, protective edge.
- 1. Mesh – Securely clinch mesh to framing.
 - 2. Framing – Fabricate framing with mortise and tenon corner construction.
 - a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommended by wire mesh partition manufacturer. Weld horizontal stiffeners for vertical framing.
 - b. Fabricate three- and four-way intersections using intersection posts.
 - c. Fabricate partition and door framing with slotted holes for connecting adjacent panels.
 - 3. Fabricate wire mesh partitions with bottom horizontal framing flush with finished floor.
 - 4. Doors – Align bottom of door with bottom of adjacent panels.
 - a. For doors that do not extend full height of partition, provide transom over door, fabricated from same mesh and framing as partition panels.
 - 5. Hardware Preparation – Mortise, reinforce, drill, and tap doors and framing as required to install hardware.

2.7 FINISHES

- A. General – Comply with NAAMM’s “Metal Finishes Manual for Architectural and Metal Products” for recommendations for applying and designating finishes.
- 1. Finish wire mesh items after assembly.

2. Appearance of Finished Work – Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Preparation for Shop Priming Nongalvanized Surfaces – Prepare nongalvanized surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed wire mesh items.
1. Exteriors (SSPC Zone 1B) – SSPC-SP 6/NACE No. 3, “Commercial Blast Cleaning.”
 2. Interiors (SSPC Zone 1A) – SSPC-SP 3, “Power Tool Cleaning.”
- C. Shop Priming – Apply shop primer to uncoated surfaces of wire mesh items, unless otherwise indicated. Comply with SSPC-PA 1, “Paint Application Specification No. 1,” for shop painting.
1. Do not apply primer to galvanized surfaces.
 2. Stripe paint corners, crevices, bolts, welds, and sharp edges.
- D. Shop Coat Finish
1. Baked-Enamel Finish – Immediately after cleaning and pretreating, apply manufacturer’s standard one-coat, baked-enamel finish. Comply with paint manufacturer’s written instructions for applying and baking to achieve a minimum dry film thickness of 1 mil.
 2. Powder-Coated Finish – Apply manufacturer’s standard baked finish, complying with manufacturer’s written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls and ceilings to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

- A. Wire Mesh Partitions:
 1. Anchor wire mesh partitions to floor with 3/8” diameter anchors at 12” o.c. through anchor clips located at each post and corner. Shim anchor clips as required to achieve level and plumb installation.
 2. Anchor wire mesh partitions to walls at 12” o.c. through back corner panel framing in accordance with wire mesh manufacturer’s installation instructions.
 - a. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
 - b. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

3. Secure top capping bars to top framing channels with ¼” diameter “U” bolts spaced not more than 28” o.c.
4. Provide line posts at locations indicated or, if not indicated, as follows:
 - a. On each side of sliding door openings.
 - b. For partitions that are 7’ to 9’ high, spaced at 15’ to 20’ o.c.
5. Where standard-width wire mesh partition panels do not fill entire length of run, provide custom-width panels to fill openings.
6. Install doors complete with door hardware ready to receive Owner Furnished padlocks.
7. Bolt accessories to wire mesh partition framing.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors to operate easily without binding.
- B. Check and readjust operating hardware items just before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work including doors and framing that are warped, bowed, or otherwise unacceptable.
- C. Touchup Painting – Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint; paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 10605

DIVISION 15 - MECHANICAL

15010 GENERAL MECHANICAL REQUIREMENTS

1.0 DESCRIPTION

A. Provide General Mechanical Requirements applicable to all Sections of this Specification.

1.1 PERMITS & INSPECTIONS (Also see GENERAL CONDITIONS para 7 and Section 01100 para 1.3)

A. Contractor shall obtain and pay for permits and licenses required to perform work covered by Division 15 Sections and obtain and pay for necessary inspections by applicable authorities.

B. State of Michigan, **Michigan Department of Labor & Economic Growth, BUREAU OF CONSTRUCTION CODES & FIRE SAFETY**, inspect and approve work and the completed system(s).

C. Certificates of Inspection shall be furnished to DMVA, Facilities Management Office, , Design Services Section , 3423 N. Martin Luther King Blvd, Lansing, Michigan 48906, by the Contractor.

1.2 RULES, CODES AND STANDARDS

A. Mechanical and Plumbing installation shall conform to 2006 Michigan Mechanical Code and 2006 Michigan Plumbing Codes.

B. Where quantities, sizes or other requirements of drawings or specifications are in excess of applicable code requirements, contractor shall comply with drawing or specification requirements.

1.3 PRODUCTS

A. Material, equipment and accessories shall, unless otherwise indicated, be new and conform to applicable standards, codes and local, state, and federal specifications.

B. Products shall be of established manufacturers regularly engaged in making type of materials provided, complete with parts, accessories, trimmings, connections, etc., reasonably incidental thereto, as specified in detail or as described in manufacturer's catalog. Properly test, adjust, lubricate and put in working order ready for service.

C. Equipment shall have manufacturer's nameplate indicating manufacturer's name, size, type, serial number, electrical characteristics, etc.

D. Equipment Selection - Project is based on specific equipment selections, Contractor selected equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed substitute equipment is **approved in writing** and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are sized accordingly. **No additional costs will be approved** for revisions required to incorporate Contractor selected/DMVA approved alternate/substitute equipment. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements. Also see INSTRUCTIONS TO BIDDERS, paragraph “Substitution of Materials” and Section 01250 CONTRACT MODIFICATION PROCEDURES.

1.4 COLOR SCHEDULE OF PIPING IDENTIFICATION

Classification	Background Color	Lettering
Fire Protection Water	Red	White
Ductwork	Off White	

1. All piping to be stenciled with direction of flow.
2. All ductwork to be stenciled with direction of flow and labeled supply or return.
3. Spacing of bands and markers should be at changes of direction, barriers, etc.

1.5 GUARANTEES AND WARRANTIES

- A. Labor, materials, and equipment shall be guaranteed by the Contractor for one year from date of acceptance.
- C. Contractor shall make repairs, alterations, adjustments, and/or replacements during his one year guarantee period as directed by DMVA to comply with Drawings and Specifications at no cost to State.

END OF SECTION 15010

DIVISION 15 - MECHANICAL**15820 DUCT ACCESSORIES****1.0 DESCRIPTION**

- A. Provide duct accessories indicated.
 - 1. Manual volume control dampers.
 - 2. Duct-mounting access doors.
 - 3. Flexible ducts.
 - 4. Duct accessories hardware.

1.1 SUBMITTALS

- A. Product Data including details for materials, dimensions of individual components, profiles, and finishes for the following items:
 - 1. Manual volume control dampers.
 - 2. Turning vanes.
 - 3. Duct-mounting access doors.
 - 4. Flexible connectors.
 - 5. Flexible ducts.
- B. Shop Drawings – Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Special fittings.
 - 2. Manual-volume damper installations.
 - 3. access doors.
- C. Coordination Drawings – Reflected ceiling plans, drawn to scale and coordinating penetrations and ceiling-mounting items. Show ceiling-mounting access panels and access doors required for access to duct accessories.

1.2 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

2.0 MATERIALS**2.1 SHEET METAL MATERIALS**

- A. Comply with SMACNA's "HVAC Duct Construction Standards—Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel - Lock-forming quality, complying with ASTM A 653, and having G90 coating designation; ducts shall have mill phosphatized finish for surfaces exposed to view.
- C. Reinforcement Shapes and Plates – Galvanized-steel reinforcement where installed on galvanized sheet metal ducts.
- D. Tie Rods - Galvanized steel, 1/4" minimum diameter for 36" length or less; 3/8" minimum diameter for lengths longer than 36".

2.2 MANUAL-VOLUME DAMPERS**A. Available Manufacturers:**

1. Air Balance, Inc.
2. METALAIRE, Inc.
3. Penn Ventilation Company, Inc.
4. Ruskin Company.

B. General Description – Factory fabricated, with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

C. Standard Volume Dampers – Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, and suitable for horizontal or vertical applications.

1. Steel Frames – Hat-shaped, galvanized sheet steel channels, minimum of 0.064” thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls and flangeless frames where indicated for installing in ducts.
 - a. Roll-Formed Steel Blades – 0.064” thick, galvanized sheet steel.
2. Aluminum Frames – Hat-shaped, 0.10” thick, aluminum sheet channels; frames with flanges where indicated for attaching to walls and flangeless frames where indicated for installing in ducts.
4. Roll-Formed Aluminum Blades – 0.010” thick aluminum sheet.
5. Extruded-Aluminum Blades – 0.050” thick extruded aluminum.
6. Blade Axles Stainless Steel or nonferrous
7. Bearings – Oil-impregnated bronze, Molded synthetic, or Stainless-steel sleeve.
8. Tie Bars and Brackets – Galvanized steel.
5. National Controlled Air, Inc.
6. Penn Ventilation Company, Inc.
7. Ruskin Company
8. Ward Industries, Inc.

2.3 TURNING VANES

- A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible." for vanes and vane runners. Vane runners shall automatically align vanes.**
- B. Manufactured Turning Vanes -** Fabricate 1-1/2-inch-wide vane, curved blades of galvanized sheet steel set 3/4 inch o.c.; support with bars perpendicular to blades set 2 inches o.c.; and set into vane runners suitable for duct mounting.
- C. Acoustic Turning Vanes -** Fabricate of airfoil-shaped aluminum extrusions with perforated faces and fibrous-glass fill.

2.4 DUCT-MOUNTING ACCESS DOORS

- A. Fabricate doors airtight and suitable for duct pressure class.**
- B. Door -** Double-wall, duct mounting, and rectangular; fabricated of galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch butt or piano hinge and cam latches.
 1. Available Manufacturers:
 - a. Air Balance, Inc.
 - b. CESCO Products
 - c. Ductmate Industries, Inc.

- d. Flexmaster U.S.A., Inc.
- e. Greenheck.
- f. McGill AirFlow Corporation.
- g. Nailor Industries Inc.
- h. Ventfabrics, Inc.
- i. Ward Industries, Inc.
2. Frame - Galvanized, sheet steel, with bend-over tabs and foam gaskets.
3. Provide number of hinges and locks as follows:
 - a. Less Than 12” Square – Secure with two sash locks.
 - b. Up to 18” Square – Two hinges and two sash locks.
 - c. Up to 24” x 48” – Three hinges and two compression latches.
 - d. Sizes Larger than 24” x 48” – One additional hinge.
- C. Door – Double wall, duct mounting, and round; fabricated of galvanized sheet metal with insulation fill and 1” thickness. Include cam latches.
 1. Available Manufacturers:
 - a. Flexmaster U.S.A., Inc.

2.5 FLEXIBLE DUCTS

- A. Available Manufacturers
 1. Ductmate Industries, Inc.
 2. Flexmaster U.S.A., Inc.
 3. Hart & Cooley, Inc.
 4. McGill AirFlow Corporation
- B. Noninsulated-Duct Connectors - UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire.
 1. Pressure Rating – 4” wg positive and 0.5” wg negative.
 2. Maximum Air Velocity – 4000 fpm.
 3. Temperature Range – Minus 20 to plus 175 deg F.
- C. Insulated-Duct Connectors - UL 181, Class 1, black polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene or aluminized vapor barrier film.
 1. Pressure Rating – 4” wg positive and 0.5” wg negative.
 2. Maximum Air Velocity – 4000 fpm.
 3. Temperature Range – Minus 20 to plus 175 deg F.
- D. Flexible Duct Clamps – Stainless-steel band with cadmium-plated screw to tighten band with a worm-gear action, in sizes 3” through 18” to suit duct size.

2.12 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes - Cast iron or cast aluminum to suit duct material, including screw cap and gasket and a flat mounting gasket. Size to allow insertion of pitot tube and other testing instruments and length to suit duct insulation thickness.
- B. Adhesives - High strength, quick setting, neoprene based, waterproof and resistant to gasoline and grease.

3.0 EXECUTION

3.1 INSTALLATION

- A. Install duct accessories according to applicable details shown in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts and NAIMA's "Fibrous Glass Duct Construction Standards" for fibrous-glass ducts.
- B. Provide duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts.
- C. Install volume dampers in ducts with liner; avoid damage to and to erosion of duct liner.
- D. Provide balancing dampers at points on supply, return, and exhaust systems where branches lead from larger ducts as required for air balancing. Install at a minimum of two duct widths from branch takeoff.
- E. Provide test holes at fan inlet and outlet and elsewhere as indicated.
- F. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units as follows:
 - 1. On both sides of duct coils.
 - 2. Downstream from volume dampers, turning vanes, and equipment.
 - 3. Adjacent to fire or smoke dampers, providing access to reset or reinstall fusible links.
 - 4. To interior of ducts for cleaning; before and after each change in direction, at maximum 50-foot spacing.
 - 5. On both sides of ducts where adequate clearance is available.
- G. Install the following sizes for duct-mounting, rectangular access doors:
 - 1. One-Hand or Inspection Access – 8" x 5".
 - 2. Two-Hand Access – 12" x 6".
 - 3. Head and Hand Access – 18" x 10".
 - 4. Head and Shoulders Access – 21" x 14".
- H. Install the following sizes for duct-mounting, round access doors:
 - 1. One-Hand or Inspection Access – 8" diameter.
 - 2. Two-Hand Access – 10" diameter.
 - 3. Head and Hand Access – 12" diameter.
 - 4. Head and Shoulders Access – 18" diameter.
 - 5. Body Access – 24" diameter.
- I. Install the following sizes for duct-mounting, pressure relief access doors:
 - 1. One-Hand or Inspection Access – 5" or 7" diameter.
 - 2. Two-Hand Access – 10" diameter.
 - 3. Head and Hand Access – 13" diameter.
- J. Label access doors according to Section MECHANICAL IDENTIFICATION STANDARD PRACTICE.
- K. Connect terminal units to supply ducts directly or with maximum 12" lengths of flexible duct. Do not use flexible ducts to change directions.
- L. Connect diffusers to low pressure ducts directly or with maximum 60" lengths of flexible duct clamped or strapped in place.

M. Connect flexible ducts to metal ducts liquid adhesive plus tape or drawn bands.

R. Install duct test holes where indicated and required for testing and balancing purposes.

3.2 ADJUSTING

A. Adjust duct accessories for proper settings.

END OF SECTION 15820

DIVISION 16 – ELECTRICAL

16010 GENERAL ELECTRICAL REQUIREMENTS

1.0 DESCRIPTION

- A. Contractor shall provide items, articles, materials, operations, and/or methods mentioned, listed, or scheduled on drawings and in these specifications, including labor, materials, equipment, and incidentals required for completion and operation of indicated system(s).
- B. Installation shall be made so component parts function together as a workable system; complete with accessories necessary for proper operation. When installation is complete, equipment shall be operative and in proper adjustment. Work shall be executed with the best practice to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness.

1.1 INSPECTIONS

- A. State of Michigan, **Michigan Department of Labor & Economic Growth, BUREAU OF CONSTRUCTION CODES & FIRE SAFETY**, Electrical Division, will provide inspection and approval of work in progress and the completed system.
- B. **CERTIFICATES OF INSPECTION** – Upon completion of work, contractor shall furnish **DEPARTMENT OF MILITARY & VETERANS AFFAIRS, Facilities Management Office, Design Services Section** , 3423 N. Martin Luther King Blvd, Lansing, Michigan 48906, certificates of inspection and approval customary for classes of work involved.

1.2 RULES, CODES AND STANDARDS

- A. Electrical installation shall conform to 2005 National Electrical Code and shall bear label of listing with approved testing laboratories.
- B. Where quantities, sizes or other requirements of drawings or specifications are in excess of applicable code requirements, contractor shall comply with drawing or specification requirements.

1.3 **DRAWINGS AND MEASUREMENTS** – These specifications and accompanying drawings describe and provide for finished work and what is called for by either shall be as binding as if called for by both. Where job conditions require reasonable changes in indicated locations and arrangement, such changes shall be made without extra cost to the Owner. Minor deviations will be permitted to allow different product manufacturers to bid on their nearest stock equipment.

1.4 **EQUIPMENT/PRODUCT SELECTION** – Project is based on specific equipment/product selections, Contractor selected equipment/product of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed substitute equipment/product is **approved in writing** and connecting services, circuit breakers, conduit, conductors, bases, and equipment spaces are sized accordingly. **No additional costs will be approved** for revisions required to incorporate Contractor selected/DMVA approved alternate/substitute equipment. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements. Also see **INSTRUCTIONS TO BIDDERS**, paragraph “Substitution of Materials” and Section **CONTRACT MODIFICATION PROCEDURES**.

1.5 RECORD DOCUMENTS

- A. Maintain one set of project drawings and specifications to be marked up by the contractor to indicate revisions to conduit/conductor sizes and locations; actual equipment locations, dimensioned to corners; concealed equipment, dimensioned to corners; circuit feeder breaker number and location; and other pertinent information to enable locating, maintenance and repair.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit manufacturer’s installation, operation and maintenance manuals, include the following information:
1. Description of function, operating characteristics and limitations, engineering data and tests, and nomenclature with commercial numbers of all replaceable parts.
 2. Manufacturer’s printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down, and emergency instructions.
 3. Maintenance procedures for routine maintenance and troubleshooting; disassembly, repair, and assembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.

- 1.7 NAMEPLATE DATA – Provide permanent operational data nameplate on each item of power operated equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliance, and similar essential data. Locate nameplate in an accessible location.

3.0 EXECUTION**3.1 CUTTING AND PATCHING**

- A. Cutting and patching of electrical equipment, components, and materials shall include removal and legal disposal of indicated materials, components, and equipment.
- B. Cut out and remove designated items and/or components made obsolete or out-of-use by the new work, as indicated.
- C. Locate, identify, and protect electrical services and components passing through demolition or remodeling areas and to remain active and operational. When such services must be interrupted, provide temporary services for affected areas and notify the Owner prior to changeover.
- D. Cutting and patching of electrical equipment, components, and materials to remain and be utilized shall be done by an electrician or electrician supervised personnel.
- E. Patch existing finished surfaces and components using new materials matching existing materials and using experienced installers. Installer’s qualifications refer to the materials and methods required for the surface and components being patched.

3.2 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications of other divisions included as a part of this specification for rough-in requirements.
- C. Provide for chases, slots, and openings in building components to allow for electrical installation.
- D. Coordinate cutting and patching of building components to accommodate installation of equipment and materials.
- E. Where mounting heights are not detailed or dimensioned, install electrical services and overhead

equipment to provide maximum available headroom.

- F. Install electrical equipment to facilitate maintenance and repair or replacement of components. As much as practical, connect equipment for ease of disconnecting with a minimum of interference with other equipment.

- 3.3 TESTS AND ADJUSTMENTS – Electrical circuits shall be tested as soon as conductors are installed, and final tests shall be made in presence of DMVA representative. If circuits are not properly controlled and insulated, make necessary changes and repairs. Electric motors shall be checked for proper rotation.

END OF SECTION 16010

DIVISION 16 ELECTRICAL

16051 – COMMON WORK RESULTS FOR ELECTRICAL

1.0 SUMMARY

- A. Section Includes:
 - 1. Electrical equipment coordination and installation.
 - 2. Sleeves for raceways and cables.
 - 3. Sleeve seals.
 - 4. Grout.
 - 5. Common electrical installation requirements.

1.1 SUBMITTALS

- A. Product Data: For sleeve seals.

1.2 COORDINATION

- A. Coordinate arrangement, mounting, and support of electrical equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section “Access Doors and Frames.”
- D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section “Through-Penetration Firestop Systems.”

2.0 PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
 - 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.
 - 2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 - 3. Pressure Plates: Plastic or carbon steel. Include two for each sealing element.
 - 4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant **coating** of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

3.0 EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide ¼-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 7 Section “Joint Sealants.”
- J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 7 Section “THROUGH-PENETRATION FIRESTOP SYSTEMS.”
- K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation **requirements are specified in** Division 7 Section “THROUGH-PENETRATION FIRESTOP SYSTEMS.”

END OF SECTION 16051

DIVISION 16 – ELECTRICAL**16060 GROUNDING AND BONDING****1.0 DESCRIPTION**

A. Provide methods and materials for grounding systems and equipment.

1.1 SUBMITTALS

A. Product Data - For each type of product indicated including:

1. Grounding connectors and conductors.
2. Grounding electrodes.
3. Exothermic welding equipment.

B. Other Informational Submittals – Plans showing dimensioned as-built locations of grounding features specified in Part 3 “Field Quality Control” Article, including the following:

1. Ground rods.
2. Ground rings.
3. Grounding arrangements and connections for separately derived systems.
4. Grounding for sensitive electronic equipment.

C. Field quality-control test reports.

D. Operation and Maintenance Data for use in operation, maintenance, and emergency.

1.2 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. UL Standard - Comply with UL 467, "Grounding and Bonding Equipment," and materials.

2.0 PRODUCTS**2.1 CONDUCTORS**

A. Insulated Conductors – Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors - ASTM B-3.
2. Stranded Conductors - ASTM B-8.
3. Tinned Conductors - ASTM B-33.
4. Bonding Conductor – No. 4 or No. 6 AWG, stranded conductor.
5. Bonding Jumper – copper tape, braided conductors, terminated with copper ferrules; 1 5/8” wide and 1/16” thick.
6. Tinned Bonding Jumper – Tinned-copper tape, braided conductors, terminated with copper ferrules; 1 5/8” wide and 1/16” thick.

C. Grounding Bus – Rectangular bars of annealed copper, 1/4” x 2” minimum in cross section, unless

otherwise indicated; with insulators.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for conductors and Pipes – Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors – Clamp type, sized for pipe.
- C. Welded Connectors – Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

3.0 EXECUTION

3.1 APPLICATION

- A. Conductors – Install solid conductor for No. 16 AWG and smaller, and stranded conductors for No., 14 AWG and larger, unless otherwise indicated.

3.2 GROUNDING SYSTEM MEASUREMENT

- A. Comply with IEEE C2 grounding requirements.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those listed below:
 - 1. Lighting circuits.
 - 2. Receptacle circuits.
 - 3. Flexible raceway runs.
 - 4. Computer and Rack-Mounted Electronic Equipment Circuits – Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- C. Signal and Communication Equipment - For telephone, alarm, voice and data, and other communication equipment, provide a #2 AWG minimum copper grounding conductor in raceway from the grounding electrode system to each service location, terminal cabinet, and central equipment location.

3.4 INSTALLATION

- A. Grounding Conductors – Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Interior Metal Ducts – Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

3.5 CONNECTIONS

- A. Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connections methods such that metals in direct contact with each other will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to assure high conductivity and make contact points closer in order of galvanic series.
 - 2. Make connections with clean bare metal at points of contact.
 - 3. Aluminum to steel connections shall be with stainless steel separators and mechanical clamps.
 - 4. Aluminum to galvanized steel connections shall be with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections involving dissimilar metals with inert material such as red lead paint to prevent future penetration of moisture to contact surfaces.

- B. Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs. Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors.

- C. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A and UL 486B.

END OF SECTION 16060

DIVISION 16 – ELECTRICAL

16120 CONDUCTORS & CABLES

1.0 DESCRIPTION

- A. Provide building wires, cables, connectors, splices, and terminations for wiring systems rated 600 V and less, sleeves and sleeve seals for cables, as indicated.

1.1 SUBMITTALS

- A. Product Data – For each type product indicated.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories – Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.3 COORDINATION

- A. Set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

2.0 PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Available Manufacturers - Subject to compliance with requirements, manufacturer's offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Alcan Aluminum Corporation; Alcan Cable Div.
 - 2. American Insulated Wire Corp.; a Leviton Co.
 - 3. General Cable Co., Inc.
 - 4. Senator Wire & Cable Company
 - 5. Southwire Company
- B. Conductor Material – Copper complying with NEMA WC 70; solid conductor for No. 16 AWG and smaller, stranded for No. 14 AWG and larger.
- C. Conductor Insulation Type –Comply with NEMA WC 70 for Types THW, THHN-THWN, XHHW, USE, and SO insulations.
- D. Multi-conductor Cable – Comply with NEMA WC 70 Type SO and Type USE with ground wire. Armored cable, Type AC, metal-clad cable, Type MC, mineral-insulated, metal-sheathed cable, Type MI, nonmetallic-sheathed cable, Type NM cables are **not allowed** on this project.

2.2 CONNECTORS & SPLICES

- A. Available Manufacturers - Subject to compliance with requirements, manufacturer's offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.

3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M Company; Electrical Products Div.
5. Tyco Electronics Corp.

B. Description - Factory-fabricated connectors and splices of size, ampacity rating, material, type and class for applications and services indicated.

3.0 EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders – Copper. Solid for No. 16 AWG and smaller; stranded for No. 14 AWG and larger.
- B. Branch Circuits – Copper. Solid for No. 16 AWG and smaller; stranded for No. 14 AWG and larger.

3.2 CONDUCTOR INSULATION APPLICATIONS AND WIRING METHODS

- A. Branch Circuits Concealed in Ceilings, Walls, and Partitions - Type THHN-THWN, single conductors in raceway.
- B. Cord Drops and Portable Appliance Connections – Type SO, hard service cord.
- C. Control Circuits - Type THHN/THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- B. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Wiring at Outlets - Install conductor at each outlet, with at least 6" of slack.

3.5 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of the assembly.

END OF SECTION 16120

DIVISION 16 - ELECTRICAL**16130 RACEWAYS AND BOXES****1.0 DESCRIPTION**

A. Provide raceways, fittings, boxes, enclosures, and cabinets for electrical wiring indicated and required.

1.1 SUBMITTALS

A. Product Data - For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories - Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

2.0 PRODUCTS**2.1 METAL CONDUIT AND TUBING**

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Co.

B. Rigid Steel Conduit - ANSI 80.1.

C. EMT - ANSI C80.3.

D. FMC - Zinc-coated steel.

E. LFMC - Flexible steel conduit with PVC jacket.

F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Fittings for EMT: Steel or die-cast, set-screw or compression type.

2.2 BOXES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cooper Crouse-Hinds; Div. Of Cooper Industries, Inc.
 - 2. EGS/Appleton Electric.
 - 3. Erickson Electrical Equipment Co.
 - 4. Hoffman
 - 5. Hubbell, Inc.; Killark Electric. Manufacturing. Co. Division
 - 6. O-Z/Gedney; a unit of General Signal
 - 7. RACO; a Hubbell Company.
 - 8. Robroy Industries, Inc.; Enclosure Division.
 - 9. Scott Fetzer Co.; Adalet Division.
 - 10. Spring City Electrical Manufacturing Company.
 - 11. Walker Systems, Inc.; Wiremold Company (The).
 - 12. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
- B. Sheet Metal Outlet and Device Boxes - NEMA OS 1.
- C. Small Sheet Metal Pull and Junction Boxes - NEMA OS 1.

3.0 EXECUTION

3.1 RACEWAY APPLICATION

- A. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 3. Boxes and Enclosures: NEMA 250, Type 1.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- E. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- F. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC in damp or wet locations not subject to severe physical damage.
- G Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

END OF SECTION 16130

DIVISION 16 - ELECTRICAL

16140 WIRING DEVICES

1.0 DESCRIPTION

- A. Provide wiring devices indicated:
 - 1. Receptacles, receptacles.
 - 2. Twist-locking receptacles.
 - 3. Communications outlets.
 - 6. Pendant cord-connector devices.
- B. Related Sections include the following:
 - 1. Division 16 Section "Voice and Data Communication System." for workstation outlets.

1.1 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.3 COORDINATION

- A. Cord and and Plug Sets – Match equipment requirements.

2.0 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
 - 3. Leviton Mfg. Company Inc. (Leviton).
 - 4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper; 5351 (single), 5352 (duplex).
 - b. Hubbell; HBL5351 (single), CR5352 (duplex).
 - c. Leviton; 5891 (single), 5352 (duplex).
 - d. Pass & Seymour; 5381 (single), 5352 (duplex).

2.3. TWIST-LOCKING RECEPTACLES.

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration as indicated on the Plans.
 - 1. Available Products – subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cooper;
 - b. Hubbell;
 - c. Leviton;
 - d. Pass & Seymour.

2.4 PENDANT CORD-CONNECTOR DEVICES

- A. Description: Matching, locking-type plug and receptacle body connector; NEMA WD 6 configurations L5-20P and L5-20R, heavy-duty grade.
 - 1. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.
 - 2. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.5 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: 0.035-inch- thick, satin-finished stainless steel
 - 3. Material for Unfinished Spaces: Galvanized steel.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant die-cast aluminum with lockable cover.

2.6 MULTIOUTLET ASSEMBLIES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Hubbell Incorporated; Wiring Device-Kellems.
 - 2. Wiremold Company (The).
- B. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
- C. Raceway Material: Metal, with manufacturer's standard finish.
- D. Wire: No. 12 AWG.

3.0 EXECUTION**3.1 INSTALLATION**

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:

1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailling existing conductors is permitted provided the outlet box is large enough.
- D. Device Installation:
1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening. Label plates with printed label. Include panel and circuit number.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom, adjacent switches under single, multigang wall plates.

END OF SECTION 16140

DIVISION 16 - ELECTRICAL

16145 LIGHTING CONTROL DEVICES

1.0 DESCRIPTION

- A. Provide lighting control devices indicated.
 - 1. Time switches.
 - 2. Outdoor photoelectric switches.
 - 3. Switch-box occupancy sensors.
 - 4. Indoor occupancy sensors.
 - 5. Multi-pole contactors.

1.1 SUBMITTALS

- A. Product data - For each product indicated.
- B. Shop Drawings – Show installation details for occupancy and light-level sensors.
 - 1. Lighting plan showing location, orientation, and coverage area of each sensor.
 - 2. Interconnection diagrams showing field-installed wiring.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data – For each type product to include emergency, operation and maintenance manuals.

1.2 DEFINITIONS

- A. LED – Light-emitting diode.
- B. PIR – Passive infrared.

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.

1.4 COORDINATION

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

2.0 PRODUCTS

2.1 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

- A. Line-Voltage Surge Protection – An integral part of the devices for 120 V and 277-V solid-state equipment. For devices without integral line-voltage surge protection, field-mounting surge protection shall comply with IEEE C62.41 and with UL 1449.

2.2 TIME SWITCHES

- A. Available Manufacturers
 - 1. Intermatic Inc.
 - 2. Leviton Mfg., Co., Inc.

3. Paragon Electric Co.
4. TORK
5. Watt Stopper (The)

- B. Digital Time Switches – Electronic, solid-state programmable units with alphanumeric display complying with UL 917.
1. Contact Configuration - DPST
 2. Contact Rating – 20A ballast load, 120/240 V ac.
 3. Program – Single channel, 8 on-off set points on a 24-hour schedule.
 4. Circuitry – Allow connections of a photoelectric relay as substitute for on and off function of a program on selected channels.
 5. Astronomical Time – All channels.
 6. Battery Back up – for schedules and time clock.

2.3 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Available Manufacturers
1. Watt Stopper (The)
- B. Description – Solid state, with DPST dry contacts rated for 1800 VA tungsten or 1000 VA inductive, to operate connected load, relay, or, contactor coils; and complying with UL 773A.
1. Light-Level Monitoring Range – 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range.
 2. Time Delay – 15-second minimum, to prevent false operation.
 3. Surge Protection – Metal-oxide varistor type, complying with IEEE C62.41 for Category A1 locations.
 4. Mounting – Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the North sky exposure.

2.4 SWITCH-BOX OCCUPANCY SENSORS

- A. Available Manufacturers:
1. Watt Stopper (The) **ONLY**.
- B. Description – PIR type with integral power-switching contacts rated for 800 W at 120-V ac, suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/6-hp motors; suitable for incandescent light fixtures, fluorescent light fixtures with magnetic or electronic ballasts, or 1/3-hp motors minimum.
1. Include ground wire.
 2. Automatic Light-Level Sensor – Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.

2.5 INDOOR OCCUPANCY SENSORS

- A. Available Manufacturers:
1. Watt Stopper (The) **ONLY**.
- B. General Description – Wall- or ceiling-mounting, solid-state units with a separate relay unit.
1. Operation – Unless otherwise indicated, turn lights on when covered area is occupied and off when unoccupied, with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 2. Sensor Output – Contacts rated to operate the connected relay, complying with UL 773A.

- Sensor shall be powered from the relay unit.
3. Relay Unit – Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70.
 4. Mounting:
 - a. Sensor – Suitable for mounting in any position on a standard outlet box.
 - b. Relay – Externally mounted through a ½” knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments – Recessed and concealed behind hinged door.
 5. Indicator – LED, to show when motion is being detected during testing and normal operation of the sensor.
 6. Bypass Switch – Override the on function in case of sensor failure.
 7. Automatic Light-Level Sensor – Adjustable from 2 to 200 fc; keeps lighting off when selected lighting level is present.
- C. PIR Type – Ceiling mounting; detect occupancy by sensing a combination of heat and movement in area of coverage.
1. Detector Sensitivity – Detect occurrences of 6” minimum movement of any portion of a human body that presents a target of at least 36 sq. in.
 2. Detection Coverage (Room) – Detect occupancy anywhere in a circular area of 1000 SF when mounted on a 96” high ceiling.
 3. Detection Coverage (Corridor) – Detect occupancy within 90 feet when mounted on a 10-foot high ceiling.
- D. Ultrasonic Type – Ceiling mounting; detect occupancy by sensing a change in pattern of reflected ultrasonic energy in area of coverage.
1. Detector Sensitivity – Detect a person of average size and weight moving at least 12” in either a horizontal or a vertical manner at an approximate speed of 12”/s.
 2. Detection Coverage (Small Room) – Detect occupancy anywhere within a circular area of 600 SF when mounted on a 96” high ceiling.
 3. Detection Coverage (Standard Room) – Detect occupancy anywhere within a circular area of 1000 SF when mounted on a 96” high ceiling.
 4. Detection Coverage (Large Room) – Detect occupancy anywhere within a circular area of 2000 SF when mounted on a 96” high ceiling.
 5. Detection Coverage (Corridor) – Detect occupancy within 90 feet when mounted on a 10’ high ceiling in a corridor not wider than 14’.
- E. Dual-Technology Type – Ceiling mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on and off functions shall be selectable in the field by operating controls on unit.
1. Sensitivity Adjustment – Separate for each sensing technology.
 2. Detector Sensitivity – Detect occurrences of 6” minimum movement of any portion of a human body that presents a target of at least 36 sq. in., and detect a person of average size and weight moving at least 12” in either a horizontal or a vertical manner at an approximate speed of 12”/s.
 3. Detection Coverage (standard room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch high ceiling.

2.6 MULTIPOLE CONTACTORS

- A. Available Manufacturers
 1. Square D ONLY

- B. Description – Electrically operated and mechanically held, as indicated on drawings, complying with NEMA ICS 2 and UL 508.
 - 1. Current Rating for Switching – Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15% or less total harmonic distortion of normal load current). Listing of rating on drawing, if larger, shall take precedence over above rating.
 - 2. Control-Coil Voltage – Match control power source.

3.0 EXECUTION

3.1 SENSOR INSTALLATION

- A. Install and aim sensors in locations to achieve at least 90% coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.
- B. Install sensors a minimum of 6-feet from any air supply air outlets or return air inlets.

3.2 WIRING INSTALLATION

- A. Wiring Method – Comply with Division 16 Section CONDUCTORS AND CABLES. Minimum conduit size shall be $\frac{3}{4}$ ".
- B. Wiring within Enclosures – Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- C. Install field-mounting transient voltage suppressors for lighting control devices in category a locations that do not have integral line-voltage surge protection.
- D. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.
- E. Splices, Taps, and Terminations – Make connections only on numbered terminal strips to junction, pull, and outlet boxes; terminal cabinets, and equipment enclosure.
- F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 IDENTIFICATION

- A. Identify components according to Section ELECTRICAL IDENTIFICATION.
- B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
 - 2. Operational Test – Verify actuation of each sensor and adjust time delays.
- B. Remove and replace lighting control devices where test results indicate they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine

compliance of replaced or additional work with specified requirements.

3.5 ADJUSTING.

- A. Occupancy Adjustment – When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose.

END OF SECTION 16145

DIVISION 16 - ELECTRICAL

16750 VOICE AND DATA COMMUNICATION SYSTEM

1.0 DESCRIPTION

- A. Provide premise wiring for voice, data, and Net distribution, three (3) CAT 6 cables to each outlet, total, as indicated.

1.1 SUBMITTALS

- A. Product data for each product indicated/specified.
 - 1. Cables.
 - 2. Connector blocks.
 - 3. Terminal blocks.
 - 4. Fiber Switch

1.2 SUBMITTALS

- A. Product data for each type of product specified.
- B. Test data and as-built drawings. Test Data is due to DMVA design department before substantial completion is reached

1.3 SYSTEM OVERVIEW

- A. This section specifies the requirements for wire, cable, connections devices, installation, and testing for wiring systems to be used as signal pathways for voice and high-speed data transmission.

1.4 QUALITY ASSURANCE

- A. All cable shall be installed and terminated to meet 100-Base T standards as defined by EIA-TIA-568 standards.
- B. The contractor shall be responsible for the most efficient routing of the cable in conduit. The cable route must avoid any electrical equipment, such as fluorescent lighting, transformers, etc. that could induce noise on the cable.
- C. Codes and Standards
 - 1. IEEE Compliance - Comply with Std 241, "IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to communication systems.
 - 2. EIA Compliance - Comply with EIA Standards RS-453, 455, and 464 pertaining to installation of telephone systems.
 - 3. ANSI/ICEA S-80-576 (1988) Communication Wire and Cable for Wiring Premises.
 - 4. NFPA National Electrical Code.
 - 5. REA 345-52 Service Entrance and Station Protector Installations (PC-5A).
 - 6. REA 345-78 Carbon Arrestor Assemblies for Use in Protectors
 - 7. ANSI/T1A/EIA - 568-B.2-1 Transmission Performance Specifications for 4-Pair 100 ohm Category 6 Cabling.

2.0 PRODUCTS

2.1 CONDUIT, OUTLET BOXES, AND COVER

- A. Provide boxes and conduit in accordance with Sections GENERAL ELECTRICAL REQUIREMENTS and COMMON WORK RESULTS FOR ELECTRICAL.
 - 1. Mount boxes flush in finish walls to match height of 120-volt receptacles., unless indicated otherwise.

2.2 TWISTED PAIR CABLE

- A. All of the voice and data locations shall be wired with unshielded twisted pair (UTP) cable that is category 6 rated and has a total of four (4) pair of copper conductors. The voice cable, and two data cables, shall be separate cables. All of the category 6 rated cable shall be plenum rated.
- B. Voice and Data Cable Jacket Color: Cable jacket color shall be factory applied and continuous along the entire length of the cable. Colors as follows:
1. Jacket color for the voice cable shall be yellow in color.
 2. Jacket color for the data cable shall be blue in color.
 3. Jacket color for the second data cable shall be blue in color.
- C. The wiring code of the cable will follow the EIA-T568B (AT&T), option B standards
- | | | |
|--------|--------------|-------|
| Pair 1 | Blue/White | Pin 4 |
| | White/Blue | Pin 5 |
| Pair 2 | White/Orange | Pin 1 |
| | Orange/White | Pin 2 |
| Pair 3 | White/Green | Pin 3 |
| | Green/White | Pin 6 |
| Pair 4 | White/Brown | Pin 7 |
| | Brown/White | Pin 8 |

2.3 CONNECTORS

- A. All category 6 UTP cabling (Wall Jacks) shall be terminated into snap-in 110 type CAT 6 RJ-45 connectors and meet TIA/EIA-568-B2.1, Cabling Transmission Performance Specifications for 4-Pair 100 ohm Category 6 Cabling. Products from Hubbell are preferred, RJ-45 Model HXJ 6 OR-orange, HXJ 6W-white.
1. Voice jacks shall be white in color.
 2. Data jacks shall be orange in color.
 3. The second data jack shall be orange in color.

2.4 FACEPLATES

- A. Faceplates shall be high impact 94V-O rated thermoplastic of the appropriate type. Each faceplate shall fit a double-gang box opening and hold four jacks in a vertical orientation. The jack layout and size of the faceplate shall be as follows:
1. Faceplate size: Double-gang box opening.
 - a. Jack orientation: Two jacks in vertical alignment next to two more jacks in vertical alignment next to two more jacks in vertical alignment.
- B. Voice, Data faceplate color shall match the electrical device plate color. If the electrical device plate is metallic, then the voice and data faceplate shall be ivory in color.

2.5 FIBER OPTIC DATA SWITCH

- A. New rack mounted fiber optic data switch shall be 24-port Cisco WS-C3750V2-24TS-S or approved equal.

2.6 CABLE AND FACEPLATE IDENTIFICATION

- A. The finished installation shall have labeling provided at each end of each cable with a permanent wrap around tag that is 6" from the end of the cable. This label should not be discarded during the installation process.
- B. All faceplates shall have each jack location identified with a permanent label that is neatly applied.

This label will include the category of use, and the cable number (EX. To-001); coordinate labeling with DMVA telecommunications mechanic.

3.0 EXECUTION

3.1 INSTALLATION

- A. Install cabling concealed in ceiling and walls. Cabling to be parallel and perpendicular to surfaces, and follow surface contours. Secure and support cables by straps, staples, or similar fittings so designed and installed to avoid damage to cables. Secure cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, or fittings.
- B. Install cabling using techniques, practices, and methods that are consistent with categories and RG type rating at components and that ensure category 6 and RG type performance of completed and linked signal path, end to end.
- C. Install cables without damaging conductor's shields or jackets. Do not bend cable to a smaller radius than minimum recommended by manufacturer.
- D. The contractor shall be responsible for the most efficient routing of the cable in conduit. The cable route must avoid any electrical equipment, such as fluorescent lighting, transformers, etc. that could induct noise on the cable.
- E. Each wall jack location shall have a single, continuous four (4) pair cable pulled to it from the source location. No splices between the patch panel and the wall jack will be accepted.
- F. All category 6 (UTP) cabling will be installed and tested in accordance with T1A/EIA-568-B2.1 Clause 11, Cabling Transmission Performance and Test Requirements. The contractor shall use an electronic testing device to test each cable for the following: (Submit printed output from this test device to DMVA for review.)
 1. Attenuation
 2. Impedance
 3. Capacity
 4. Resistance
 5. Length
 6. dB loss
 7. Pin Assignments
 8. Continuity
 9. Polarity
 10. Near end cross talk

3.2 IDENTIFICATION

- A. Common Areas & Office Marking Standard:
 1. The connection boxes placed on walls or in the bases of cubical furniture shall be labeled clockwise from the main entrance door A, B, C, around the outside wall, then to interior walls and cubical connections until all interfaces are designated.
 2. A two-letter system can be used in rooms where more than 26 interfaces exist, AA AB, AC, etc.
 3. Each jack position on the interface will be numbered 1, 2, 3, etc, from right to left, top to bottom on that jack below the connector with a label. The label will include the room number, interface designation, and port number. On the second line of the same label or separated with a '/' the patch panel designation as defined below.

3.3 TESTING REPAIR/REPLACEMENT

A. Any cable that fails any one of the tests in the engineer's opinion must be repaired or replaced at the contractor's expense, and re-tested.

3.4 AS-BUILT DOCUMENTATION - Prior to final acceptance of this project, an as-built print with an electronic version, cable inventory and final testing results of the entire voice cable plant and electronics must be submitted to DMVA.

END OF SECTION 16750

END OF SPECIFICATION AU100013 02/09/10



STATE OF MICHIGAN

JENNIFER M. GRANHOLM
GOVERNOR

DEPARTMENT OF ENERGY, LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

REQUIREMENTS OF THE PREVAILING WAGES ON STATE PROJECTS ACT, PUBLIC ACT 166 OF 1965

The Michigan Department of Labor & Economic Growth determines prevailing rates pursuant to the Prevailing Wages on State Projects Act, Public Act 166 of 1965, as amended. The purpose of establishing prevailing rates is to provide minimum rates of pay that must be paid to workers on construction projects for which the state or a school district is the contracting agent and which is financed or financially supported by the state. By law, prevailing rates are compiled from the rates contained in collectively bargained agreements which cover the locations of the state projects. The official prevailing rates provide an hourly rate which includes wage and fringe benefit totals for designated construction mechanic classifications. The overtime rates also include wage and fringe benefit totals. Please pay special attention to the overtime and premium pay requirements. Prevailing wage is satisfied when wages plus fringe benefits paid to a worker are equal to or greater than the required rate.

State of Michigan responsibilities under the law:

- The department establishes the prevailing rate for each classification of construction mechanic **requested by a contracting agent** prior to contracts being let out for bid on a state project.

Contracting agent responsibilities under the law:

- If a contract is not awarded or construction does not start within 90 days of the date of the issuance of rates, a re-determination of rates must be requested by the contracting agent.
- Rates for classifications needed but not provided on the Prevailing Rate Schedule, **must** be obtained **prior** to contracts being let out for bid on a state project.
- The contracting agent, by written notice to the contractor and the sureties of the contractor known to the contracting agent, may terminate the contractor's right to proceed with that part of the contract, for which less than the prevailing rates have been or will be paid, and may proceed to complete the contract by separate agreement with another contractor or otherwise, and the original contractor and his sureties shall be liable to the contracting agent for any excess costs occasioned thereby.

Contractor responsibilities under the law:

- Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing rates prescribed in a contract.
- Every contractor and subcontractor shall keep certified payrolls, as used in the industry, of each and every construction mechanic, and verification of such certified payroll in writing by either a representative or auditor/certified accountant at the end of such a

DELEG is an equal opportunity employer/program.

Auxiliary aids, services and other reasonable accommodations are available upon request to individuals with disabilities.

certified payroll. These records should include the occupation and indicate the hours worked on each project for each classification and the actual wages and benefits paid. This record shall be available for reasonable inspection by the contracting agent or the department.

- Each contractor or subcontractor is separately liable for the payment of the prevailing rate to its employees.
- The prime contractor is responsible for advising all subcontractors of the requirement to pay the prevailing rate prior to commencement of work.
- The prime contractor is secondarily liable for payment of prevailing rates that are not paid by a subcontractor.
- A construction mechanic shall only be paid the apprentice rate if registered with the United States Department of Labor, Bureau of Apprenticeship and Training and the rate is included in the contract.

Enforcement:

A person who has information of an alleged prevailing wage violation on a state project may file a complaint with the Wage & Hour Division. The department will investigate and attempt to resolve the complaint informally. During the course of an investigation, if the requested records and posting certification are not made available in compliance with Section 5 of Act 166, the investigation will be concluded and a referral to the Office of Attorney General for civil action will be made. The Office of Attorney General will pursue costs and fees associated with a lawsuit if filing is necessary to obtain records.

A violation of Act 166 may result in the contractor's name being added to the Prevailing Wage Act Violators List published on the division's website, updated monthly. This list includes the names and addresses of contractors and subcontractors the division has found in violation of Act 166 based on complaints from individuals and third parties. The Prevailing Wage Act Violators List is intended to inform contracting agents of contractors that have violated Act 166 for use in determining who should receive state-funded projects.



Michigan Department of Energy, Labor & Economic Growth

Wage & Hour Division

PO Box 30476

Lansing , MI 48909-7976

517.335.0400

www.michigan.gov/wagehour



JENNIFER M. GRANHOLM GOVERNOR

STANLEY "SKIP" PRUSS DIRECTOR

Informational Sheet: Prevailing Wages on State Projects
General Information Regarding Fringe Benefits

Certain fringe benefits may be credited toward the payment of the Prevailing Wage Rate:

- If a fringe benefit is paid directly to a construction mechanic
If a fringe benefit contribution or payment is made on behalf of a construction mechanic
If a fringe benefit, which may be provided to a construction mechanic, is pursuant to a written contract or policy
If a fringe benefit is paid into a fund, for a construction mechanic

When a fringe benefit is not paid by an hourly rate, the hourly credit will be calculated based on the annual value of the fringe benefit divided by 2080 hours per year (52 weeks @ 40 hours per week).

The following is an example of the types of fringe benefits allowed and how an hourly credit is calculated:

Table with 3 columns: Fringe Benefit Type, Calculation, and Hourly Credit. Includes rows for Vacation, Dental insurance, Vision insurance, Health insurance, Life insurance, Tuition, Bonus, 401k Employer Contribution, and Total Hourly Credit (\$3.65).

Other examples of the types of fringe benefits allowed:

- Sick pay
Holiday pay
Accidental Death & Dismemberment insurance premiums

The following are examples of items that will not be credited toward the payment of the Prevailing Wage Rate

- Legally required payments, such as:
Unemployment Insurance payments
Workers' Compensation Insurance payments
FICA (Social Security contributions, Medicare contributions)
Reimbursable expenses, such as:
Clothing allowance or reimbursement
Uniform allowance or reimbursement
Gas allowance or reimbursement
Travel time or payment
Meals or lodging allowance or reimbursement
Per diem allowance or payment
Other payments to or on behalf of a construction mechanic that are not wages or fringe benefits, such as:
Industry advancement funds
Financial or material loans

Official Request #: 414

Requestor: DEPT. OF MILITARY & VETERANS AFFAIRS

Project Description: CONSTRUCTING 3 OFFICES

Project Number: AUGUSTA ARMORY MODIFICATIONS 511/10143.AGY

Kalamazoo County

Official 2010 Prevailing Wage Rates for State Funded Projects

Issue Date: 3/22/2010

Contract must be awarded by: 6/20/2010

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<u>Classification</u>			Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Name	Description						
Asbestos & Lead Abatement Laborer							
Asbestos & Lead Abatement Laborer	MLDC		8/6/2009	\$35.55	\$47.67	\$59.78	H H H X X X D Y
4 ten hour days @ straight time allowed Monday-Saturday, must be consecutive calendar days							
Asbestos & Lead Abatement, Hazardous Material Handler							
Asbestos and Lead Abatement, Hazardous Material Handler	AS207		11/4/2009	\$35.55	\$48.15	\$60.75	H H H X X X D Y
4 ten hour days @ straight time allowed Monday-							
Boilermaker							
Boilermaker	BO169		8/14/2009	\$54.70	\$81.08	\$107.45	H H H H H H D Y
Apprentice Rates:							
				\$40.31	\$59.49	\$78.67	
				\$41.45	\$61.21	\$80.95	
				\$42.57	\$62.88	\$83.19	
				\$43.69	\$64.57	\$85.43	
				\$44.81	\$66.24	\$87.67	
				\$49.53	\$73.40	\$97.26	
				\$49.32	\$73.01	\$96.69	
				\$51.58	\$76.40	\$101.21	
Bricklayer							
Bricklayer, Block, Stone, Artificial and Marble Masonry, and Pointers,Cleaners and Caulkers	BR9-17-BL		10/30/2009	\$39.56	\$52.61	\$65.65	H H H X X X D Y
Apprentice Rates:							
				\$29.12	\$36.95	\$44.77	
				\$30.43	\$38.91	\$47.39	
				\$31.73	\$40.86	\$49.99	
				\$33.04	\$42.83	\$52.61	
				\$34.34	\$44.77	\$55.21	
				\$35.65	\$46.74	\$57.83	
				\$36.95	\$48.69	\$60.43	
				\$38.26	\$50.65	\$63.05	

Official Request 414

Requestor: DEPT. OF MILITARY & VETERANS AFFAIRS

Project Description: CONSTRUCTING 3 OFFICES

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County: Kalamazoo

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

Official 2010 Prevailing Wage Rates for State Funded Projects

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<u>Classification</u>	Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Carpenter							
	Carpenter and Piledriver	CA-525	1/28/2009	\$34.30	\$45.93	\$57.56	H H H H H H H D N
		Apprentice Rates:					
		1st year		\$19.76	\$25.57	\$31.39	
		2nd year		\$22.66	\$29.64	\$36.62	
		3rd year		\$27.00	\$35.72	\$44.44	
		4th year		\$29.89	\$39.78	\$49.66	
	Floor Layer	CA-525-FL	1/28/2009	\$27.26	\$36.42	\$45.57	H H H H H H H D N
		Apprentice Rates:					
		1st year		\$18.10	\$22.67	\$27.25	
		2nd year		\$20.85	\$26.80	\$32.75	
		3rd year		\$22.68	\$29.55	\$36.41	
		4th year		\$24.51	\$32.29	\$40.07	
Cement Mason							
	Cement Mason	BR9-17-CM	10/30/2009	\$37.57	\$49.39	\$61.20	H H D X X X D D Y
		Apprentice Rates:					
		0 - 749 hours		\$29.30	\$36.98	\$44.66	
		750 - 1,499 hours		\$30.48	\$38.75	\$47.02	
		1,500 - 2,249 hours		\$31.66	\$40.52	\$49.38	
		2,250 - 2,999 hours		\$32.84	\$42.29	\$51.74	
		3,000 - 3,749 hours		\$34.03	\$44.08	\$54.12	
		3,750 - 4,499 hours		\$35.21	\$45.84	\$56.48	
	Cement Mason	PL16-5	10/16/2009	\$33.08	\$43.98	\$54.88	H H H H H H H D Y
	Four 10s allowed Monday-Thursday with Friday or Saturday inclement weather make up days. Saturday hours for inclement weather make up shall be paid straight rate unless over 40 hours worked.						
		Apprentice Rates:					
		1st year		\$25.45	\$32.54	\$39.62	
		2nd year		\$27.63	\$35.80	\$43.98	
		3rd year		\$29.81	\$39.08	\$48.34	

Official Request 414
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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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Electrician

Inside Wireman	EC-131-IW		\$41.22	\$58.97	\$76.72	H H H H H H H D Y
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1/22/2010

Four 10s may be worked if consecutive Monday thru Thursday. Friday may be used as a makeup day.

Apprentice Rates:

0-1000 hours		\$13.99	\$19.99	\$25.98
1000-2000 hours		\$19.19	\$25.94	\$32.68
2000-3500 hours		\$22.59	\$31.16	\$39.72
3500-5000 hours		\$24.15	\$33.49	\$42.83
5000-6500 hours		\$27.67	\$38.78	\$49.87
6500-8000 hours		\$31.09	\$43.78	\$56.46

Sound and Communication Technician	EC-131-SC		\$22.55	\$31.35	\$40.14	H H H H H H H D Y
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1/19/2006

Apprentice Rates:

1st 6 months		\$10.96	\$15.80	\$20.64
2nd 6 months		\$11.84	\$17.12	\$22.40
3rd 6 months		\$12.72	\$18.44	\$24.16
4th 6 months		\$13.60	\$19.76	\$25.92
5th 6 months		\$14.48	\$21.08	\$27.68
6th 6 months		\$15.36	\$22.40	\$29.44

Lineman/Technician outside utility and commercial power and high voltage pipe type cable work and electrical underground.	EC-876		\$47.05	\$68.11	\$89.17	H H H H H H H D Y
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11/18/2009

Four 10s allowed Monday-Thursday with Friday makeup or Tuesday-Friday with Monday makeup.

Apprentice Rates:

1st period		\$30.20	\$42.69	\$55.26
2nd period		\$32.32	\$46.02	\$59.70
3rd period		\$34.42	\$49.16	\$63.90
4th period		\$36.53	\$52.33	\$68.12
5th period		\$38.63	\$55.47	\$72.32
6th period		\$40.74	\$58.64	\$76.54
7th period		\$42.84	\$61.79	\$80.74

Elevator Constructor

Elevator Constructor Mechanic	EL-85		\$62.80		\$105.53	D D D D D D D D Y
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3/3/2010

Apprentice Rates:

1st year		\$43.57		\$67.07
2nd year		\$47.84		\$75.61
3rd year		\$49.98		\$79.89
4th year		\$54.25		\$88.43

Official Request 414
 Requestor: DEPT. OF MILITARY & VETERANS AFFAIRS
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 County: Kalamazoo

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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Glazier

Glazier	GL-312	10/7/2009	\$31.34	\$43.86	\$56.38 X X X X X X D Y
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A four ten hour day work week is allowed. If 4 or more straight-time hours lost due to job being down, Friday may be scheduled as a make up day.

Apprentice Rates:

1st 90 days	\$17.57	\$23.20	\$28.84
2nd 90 days	\$18.82	\$25.08	\$31.34
2nd 6 months	\$20.07	\$26.96	\$33.84
3rd 6 months	\$21.32	\$28.83	\$36.34
4th 6 months	\$22.58	\$30.72	\$38.86
5th 6 months	\$23.83	\$32.60	\$41.36
6th 6 months	\$25.08	\$34.47	\$43.86
7th 6 months	\$26.33	\$36.34	\$46.36
8th 6 months	\$27.58	\$38.22	\$48.86
9th 6 months	\$28.84	\$40.11	\$51.38
10th 6 months	\$30.09	\$41.98	\$53.88

Heat and Frost Insulator

Spray Insulation	AS25S	3/5/2007	\$20.14	\$29.14	H H H H H H H N
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Heat and Frost Insulator and Asbestos Worker

Heat and Frost Insulator and Asbestos Worker 4 ten hour work days shall be either Monday thru Thursday or Tuesday thru Friday	AS47	7/20/2009	\$43.80	\$58.01	\$72.22 H H H H H H D Y
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Apprentice Rates:

1st year	\$25.48	\$32.59	\$39.69
2nd year	\$29.14	\$37.67	\$46.19
3rd year	\$32.80	\$42.75	\$52.69
4th year	\$36.47	\$47.84	\$59.21
5th year	\$40.14	\$52.93	\$65.72

Ironworker

Pre-engineered Metal Work	IR-25-PE-Z3	5/8/2008	\$39.47	\$49.54	\$59.60 X X H X X X D Y
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Apprentice Rates:

1st Level	\$23.47	\$28.51	\$33.55
2nd Level	\$25.12	\$30.85	\$36.58
3rd Level	\$26.78	\$33.19	\$39.61
4th Level	\$28.44	\$35.55	\$42.66
5th Level	\$30.10	\$37.90	\$45.70
6th Level	\$31.36	\$39.65	\$47.93

Official Request 414
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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Fence, Sound Barrier & Guardrail erection/installation and Exterior Signage work Four ten hour work days may be worked during Monday-Saturday.	IR-340-F2 8/13/2009	\$26.80	\$36.63	\$46.45	X X H X X X H D N
Apprentice Rates:					
		60% Level \$18.70	\$24.59	\$30.49	
		65% Level \$19.71	\$26.10	\$32.48	
		70% Level \$20.73	\$27.61	\$34.49	
		75% Level \$21.74	\$29.11	\$36.48	
		80% Level \$22.75	\$30.61	\$38.47	
Reinforcing	IR-340-Ref 3/3/2010	\$41.46	\$53.30	\$65.14	X X X X X X D Y
Apprentice Rates:					
		Registered 1st year \$26.01	\$33.05	\$40.09	
		Registered 2nd year \$27.21	\$34.85	\$42.49	
		Registered 3rd year \$32.61	\$42.05	\$51.49	
Rigger / Machinery mover	IR-340-RIG 3/8/2010	\$35.58	\$46.71	\$57.83	X X X X X X D Y
Apprentice Rates:					
		1st year \$20.43	\$26.00	\$31.56	
		2nd year \$23.76	\$30.99	\$38.22	
		3rd year \$28.63	\$37.53	\$46.43	
		4th year \$30.82	\$40.83	\$50.85	
Structural and Finish work	IR-340-STR 3/3/2010	\$41.46	\$53.30	\$65.14	X X X X X X D Y
Apprentice Rates:					
		1st Year Registered \$26.01	\$33.05	\$40.09	
		2nd Year Registered \$27.21	\$34.85	\$42.49	
		3rd Year Registered \$32.61	\$42.05	\$51.49	
		4th Year Registered \$35.01	\$45.65	\$56.29	

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Classification	Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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Laborer

<p>Class A Laborer - all construction on buildings, pumps, well wheels, air, electric or gasoline tools, motor driven buggies, fire watch duty, working on swing scaffolds, heavy construction work, carpenter tender, cement finisher tender, heater tender, and flagperson. Cleaning and clearing of all debris, including wire brushing of windows, scraping of floors, removal of surplus material from all fixtures within confines of structure and cleaning all debris in building and construction area. The general cleanup, including sweeping, cleaning, washdown and wiping of construction facility, equipment and furnishings and removal and loading or burning of all debris including crates, boxes, packaging waste material. Washing and cleaning of walls, partitions, ceilings, windows, bathrooms, kitchens, laboratory, and all fixtures and facilities therein. Cleanup, mopping, washing, waxing and polishing or dusting of all floors or areas.</p>	L355-1-A	11/9/2009	\$28.86	\$37.81	\$46.75	H H H H H H D Y
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Four 10s allowed if consecutive days Monday-Friday. Must begin Monday except in the event of inclement weather or holiday. Friday and Saturday inclement weather make-up day allowed. In order for Saturday to be a make-up day, work must be scheduled for Friday.

Apprentice Rates:

0-1,000 work hours	\$24.39	\$31.10	\$37.81
1,001-2,000 work hours	\$25.28	\$32.43	\$39.59
2,001-3,000 work hours	\$26.18	\$33.79	\$41.39
3,001-4,000 work hours	\$27.97	\$36.47	\$44.97

<p>Class B Laborer - jackhammer operator, crocklayer and caisson worker in buildings</p>	L355-1-B	6/8/2009	\$29.11	\$38.18	\$47.25	H H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$24.57	\$31.37	\$38.17
1,001-2,000 work hours	\$25.48	\$32.73	\$39.99
2,001-3,000 work hours	\$26.39	\$34.10	\$41.81
3,001-4,000 work hours	\$28.20	\$36.81	\$45.43

<p>Class C Laborer - top men on chimneys or towers over thirty feet in height, material mixers, portable mixer operator, plasterer tender, mason tender certified from M.L.T.I., and MLTAI certified demolition burner.</p>	L355-1-C	6/8/2009	\$29.61	\$38.93	\$48.25	H H H H H H D Y
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Apprentice Rates:

0-1,000 work hours	\$24.95	\$31.94	\$38.93
1,001-2,000 work hours	\$25.88	\$33.33	\$40.79
2,001-3,000 work hours	\$26.81	\$34.73	\$42.65
3,001-4,000 work hours	\$28.68	\$37.53	\$46.39

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class D Laborer - concrete specialist when no cement finishers are available; troweling, finishing, screeding, patching, cutting, curing of cast in place or precast concrete by any and all methods.	L355-1-D 6/8/2009	\$34.06	\$44.96	\$55.85	H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$28.61	\$36.78	\$44.95
		1,001-2,000 work hours	\$29.70	\$38.41	\$47.13
		2,001-3,000 work hours	\$30.79	\$40.05	\$49.31
		3,001-4,000 work hours	\$32.97	\$43.32	\$53.67
Laborer - Hazardous					
Class A Laborer - performing work in conjunction with site preparation and other preliminary work prior to actual removal, handling, or containment of hazardous waste substances not requiring use of personal protective equipment required by state or federal regulations; or a laborer performing work in conjunction with the removal, handling, or containment of hazardous waste substances when use of personal protective equipment level "D" is required.	LHAZ-Z9-A 11/14/2008	\$29.57	\$41.90	\$54.22	H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$25.07	\$35.15	\$45.22
		1,001-2,000 work hours	\$25.97	\$36.50	\$47.02
		2,001-3,000 work hours	\$26.87	\$37.85	\$48.82
		3,001-4,000 work hours	\$28.67	\$40.55	\$52.42
Class B Laborer - performing work in conjunction with the removal, handling, or containment of hazardous waste substances when the use of personal protective equipment levels "A", "B" or "C" is required.	LHAZ-Z9-B 11/14/2008	\$30.57	\$43.40	\$56.22	H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$25.81	\$36.26	\$46.70
		1,001-2,000 work hours	\$26.77	\$37.70	\$48.62
		2,001-3,000 work hours	\$27.72	\$39.13	\$50.52
		3,001-4,000 work hours	\$29.62	\$41.97	\$54.32
Laborer Underground - Tunnel, Shaft & Caisson					
Class I - Tunnel, shaft and caisson laborer, dump man, shanty man, hog house tender, testing man (on gas), and watchman.	LAUCT-Z2-1 9/10/2009	\$32.34	\$43.03	\$53.71	H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$27.37	\$35.57	\$43.77
		1,001-2,000 work hours	\$28.37	\$37.07	\$45.77
		2,001-3,000 work hours	\$29.36	\$38.56	\$47.75
		3,001-4,000 work hours	\$31.35	\$41.54	\$51.73

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder	LAUCT-Z2-2 9/10/2009	\$32.43	\$43.16	\$53.89	H H H H H H D Y
Apprentice Rates:					
		\$27.44	\$35.68	\$43.91	
		\$28.44	\$37.18	\$45.91	
		\$29.44	\$38.68	\$47.91	
		\$31.43	\$41.66	\$51.89	
Class III - Air tool operator (jack hammer man, bush hammer man and grinding man), first bottom man, second bottom man, cage tender, car pusher, carrier man, concrete man, concrete form man, concrete repair man, cement invert laborer, cement finisher, concrete shoveler, conveyor man, floor man, gasoline and electric tool operator, gunnite man, grout operator, welder, heading dinky man, inside lock tender, pea gravel operator, pump man, outside lock tender, scaffold man, top signal man, switch man, track man, tugger man, utility man, vibrator man, winch operator, pipe jacking man, wagon drill and air track operator and concrete saw operator (under 40	LAUCT-Z2-3 9/10/2009	\$32.53	\$43.31	\$54.09	H H H H H H D Y
Apprentice Rates:					
		\$27.51	\$35.78	\$44.05	
		\$28.52	\$37.30	\$46.07	
		\$29.52	\$38.80	\$48.07	
		\$31.53	\$41.81	\$52.09	
Class IV - Tunnel, shaft and caisson mucker, bracer man, liner plate man, long haul dinky driver and well point	LAUCT-Z2-4 9/10/2009	\$32.69	\$43.55	\$54.41	H H H H H H D Y
Apprentice Rates:					
		\$27.63	\$35.96	\$44.29	
		\$28.65	\$37.49	\$46.33	
		\$29.66	\$39.00	\$48.35	
		\$31.68	\$42.04	\$52.39	
Class V - Tunnel, shaft and caisson miner, drill runner, keyboard operator, power knife operator, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars)	LAUCT-Z2-5 9/10/2009	\$32.95	\$43.94	\$54.93	H H H H H H D Y
Apprentice Rates:					
		\$27.83	\$36.26	\$44.69	
		\$28.85	\$37.79	\$46.73	
		\$29.88	\$39.34	\$48.79	
		\$31.93	\$42.41	\$52.89	

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Classification Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class VI - Dynamite man and powder man.	LAUCT-Z2-6	9/10/2009	\$33.26	\$44.41	\$55.55	H H H H H H D Y
Apprentice Rates:						
			0-1,000 work hours	\$28.06	\$36.60	\$45.15
			1,001-2,000 work hours	\$29.10	\$38.16	\$47.23
			2,001-3,000 work hours	\$30.14	\$39.72	\$49.31
			3,001-4,000 work hours	\$32.22	\$42.84	\$53.47
Class VII - Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes and flagstones.	LAUCT-Z2-7	9/10/2009	\$25.53	\$32.81	\$40.09	H H H H H H D Y
Apprentice Rates:						
			0-1,000 work hours	\$22.27	\$27.92	\$33.57
			1,001-2,000 work hours	\$22.92	\$28.90	\$34.87
			2,001-3,000 work hours	\$23.57	\$29.87	\$36.17
			3,001-4,000 work hours	\$24.88	\$31.84	\$38.79
Landscape Laborer						
Landscape Specialist includes air, gas, and diesel equipment operator, lawn sprinkler installer on landscaping work where seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintenance of landscape projects occurs.	LLAN-Z2-A	7/9/2009	\$24.65	\$33.97	\$43.28	X X H X X X H D Y
Sundays paid at time & one half. Holidays paid at double						
All work pertaining to landscaping where seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintaining of landscape projects occurs which may include small power tool operator, lawn sprinkler installer helper, material mover, truck driver.	LLAN-Z2-B	7/9/2009	\$20.45	\$27.67	\$34.88	X X H X X X H D Y
Sundays paid at time & one half. Holidays paid at double time.						

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Classification	Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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Operating Engineer

Class C- Regular equipment operator, crane, stiff leg derrick, scraper dozer, grader, front end loader, hoist, job mechanic, head grease man, concrete pump truck & hydro excavators	EN-324-BH1C	9/28/2009	\$45.55	\$59.37	\$73.19	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to

Apprentice Rates:

0 - 999 hours	\$36.76	\$46.43	\$56.11
1,000 - 1,999 hours	\$38.14	\$48.51	\$58.87
2,000 - 2,999 hours	\$39.52	\$50.57	\$61.63
3,000 - 3,999 hours	\$40.90	\$52.65	\$64.39
4,000 - 4,999 hours	\$42.29	\$54.73	\$67.17
5,000 - 5,999 hours	\$43.67	\$56.80	\$69.93

Class D- Air tugger (single drum), material hoist, boiler operator, sweeping machine, winch truck, Bob Cat & similar equipment, elevators (when operated by an operating engineer), and fork truck over 20' lift	EN-324-BH1D	9/28/2009	\$40.45	\$51.72	\$62.99	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on

Class E- Pump 6" or over, well points, freeze systems, boom truck (non-swinging), end dumps and laser/power screed, concrete wire saw 20 h.p. and over, & brokk concrete breaker	EN-324-BH1E	9/28/2009	\$39.85	\$50.82	\$61.79	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on

Class F- Air compressor, welder, generators, conveyors, pumps under 6", Grease man, and fork truck 20' or less lift	EN-324-BH1F	9/28/2009	\$37.40	\$47.15	\$56.89	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to

Class G- Oiler, fireman and heater operator Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on	EN-324-BH1G	9/28/2009	\$35.75	\$44.67	\$53.59	H H H H H H H D Y
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<u>Classification</u> Name Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class A- Crane w/ main Boom & Jib 220' or longer Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on	EN-OSA	9/28/2009	\$46.30	\$60.50	\$74.69	H H H H H H D Y
Class A- Crane w/ main Boom & Jib 300' or longer Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on	EN-OSA3	9/28/2009	\$47.80	\$62.75	\$77.69	H H H H H H D Y
Class A- Crane w/ main Boom & Jib 400' or longer Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.	EN-OSA4	9/28/2009	\$49.30	\$65.00	\$80.69	H H H H H H D Y
Class B- Crane Operator with main boom and jib 140' or longer, tower cranes, gantry crane, whirley derrick Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work unable to be performed due to weather, Monday-Thursday may be scheduled on	EN-OSB	9/28/2009	\$46.05	\$60.12	\$74.19	H H H H H H D Y
Operating Engineer - Marine Construction Diver/Wet Tender, Engineer (hydraulic dredge)	GLF-1	1/5/2010	\$57.10	\$74.85	\$92.60	X X H H H H D Y
Holiday pay= \$110.35 per hour						
<u>Subdivision of county</u> all Great Lakes, islands therein, & connecting & tributary waters Crane/Backhoe Operator, 70 ton or over Tug Operator, Mechanic/Welder, Assistant Engineer (hydraulic dredge), Leverman (hydraulic dredge), Diver Tender	GLF-2	1/5/2010	\$55.60	\$72.60	\$89.60	X X H H H H D Y
Holiday pay = \$106.60 per hour						
<u>Subdivision of county</u> All Great Lakes, islands therein, & connecting & tributary waters Deck Equipment Operator, Machineryman, Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 lbs or more), Tug/Launch Operator, Loader, Dozer on Barge, Deck Machinery	GLF-3	1/5/2010	\$51.85	\$66.98	\$82.10	X X H H H H D Y
Holiday pay = \$97.22 per hour						
<u>Subdivision of county</u> All Great Lakes, islands therein, & connecting & tributary waters						

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Deck Equipment Operator, (Machineryman/Fireman), (4 equipment units or more), Off Road Trucks, Deck Hand, Tug Engineer, & Crane Maintenance 50 ton capacity and under or Backhoe 115,000 lbs or less, Assistant Tug Operator	GLF-4 1/5/2010	\$46.75	\$59.33	\$71.90	X X H H H H H D Y

Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters

Operating Engineer Hazardous Waste Class I

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWCI-Z2A 10/2/2009	\$48.03	\$63.09	\$78.15	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday

Apprentice Rates:

1st 6 months	\$38.49	\$49.04	\$59.57
2nd 6 months	\$40.00	\$51.30	\$62.59
3rd 6 months	\$41.50	\$53.54	\$65.59
4th 6 months	\$43.01	\$55.81	\$68.61
5th 6 months	\$44.52	\$58.08	\$71.63
6th 6 months	\$46.02	\$60.33	\$74.63

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWCI-Z2B 10/2/2009	\$47.08	\$61.67	\$76.25	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$37.83	\$48.04	\$58.25
2nd 6 months	\$39.29	\$50.23	\$61.17
3rd 6 months	\$40.76	\$52.44	\$64.11
4th 6 months	\$42.20	\$54.60	\$66.99
5th 6 months	\$43.66	\$56.78	\$69.91
6th 6 months	\$45.13	\$58.99	\$72.85

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCI-Z2D 10/2/2009	\$45.78	\$59.72	\$73.65	H H H H H H D Y

Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$36.91	\$46.66	\$56.41
2nd 6 months	\$38.31	\$48.77	\$59.21
3rd 6 months	\$39.70	\$50.85	\$61.99
4th 6 months	\$41.10	\$52.95	\$64.79
5th 6 months	\$42.49	\$55.04	\$67.57
6th 6 months	\$43.88	\$57.12	\$70.35

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCI-Z2DCL 10/2/2009	\$45.53	\$59.34	\$73.15	H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Apprentice Rates:

1st 6 months	\$36.74	\$46.41	\$56.07
2nd 6 months	\$38.13	\$48.49	\$58.85
3rd 6 months	\$39.51	\$50.56	\$61.61
4th 6 months	\$40.89	\$52.63	\$64.37
5th 6 months	\$42.27	\$54.70	\$67.13
6th 6 months	\$43.65	\$56.77	\$69.89

Operating Engineer Hazardous Waste Class II

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWCII-Z2A 10/2/2009	\$43.63	\$56.49	\$69.35	H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWCII-Z2B 10/2/2009	\$42.69	\$55.08	\$67.47	H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

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Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCII-Z2D 10/2/2009	\$41.39	\$53.13	\$64.87	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCII-Z2DCL 10/2/2009	\$41.14	\$52.76	\$64.37	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads 140' or longer					
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HW140-Z2A 10/2/2009	\$50.68	\$67.07	\$83.45	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday					
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HW140-Z2B 10/2/2009	\$49.62	\$65.48	\$81.33	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW140-Z2D 10/2/2009	\$48.43	\$63.69	\$78.95	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW140-Z2DCL 10/2/2009	\$48.18	\$63.32	\$78.45	H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					

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Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads 220' or longer

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HW220-Z2A 10/2/2009	\$50.98	\$67.52	\$84.05	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday

Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HW220-Z2B 10/2/2009	\$49.94	\$65.96	\$81.97	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z2D 10/2/2009	\$48.73	\$64.14	\$79.55	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z2DCL 10/2/2009	\$48.48	\$63.77	\$79.05	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.

Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with boom

Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWRC-Z2A 10/2/2009	\$49.00	\$64.55	\$80.09	H H H H H H H D Y
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Four 10 hour days may be worked Monday-Thursday

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Official Rate Schedule
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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with Boom Operator					
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWRC-Z2B 10/2/2009	\$48.05	\$63.12	\$78.19	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z2D 10/2/2009	\$46.75	\$61.17	\$75.59	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z2DCL 10/2/2009	\$46.50	\$60.80	\$75.09	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.					
Operating Engineer Steel Work					
Class A- Crane w/ main Boom & Jib 220' or longer Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.	EN-324-SWW1220 9/29/2009	\$46.65	\$61.02	\$75.39	H H H H H H H D Y
Class A- Crane w/ main Boom & Jib 300' or longer	EN-324-SWW1300 9/29/2009	\$48.15	\$63.27	\$78.39	H H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.					
Class A- Crane w/ main Boom & Jib 400' or longer	EN-324-SWW1400 9/29/2009	\$49.65	\$65.52	\$81.39	H H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.					
Class B- Crane Operator with main boom and jib 140' or longer, tower cranes, gantry crane, whirley derrick	EN-324-SWW1B 9/29/2009	\$46.40	\$60.65	\$74.89	H H H H H H H D Y
Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.					

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class C- Regular equipment operator, crane, dozer, grader, loader, hoist, straddle wagon, job mechanic & hydro excavator	EN-324-SWW1C 9/29/2009	\$45.90	\$59.90	\$73.89	H H H H H H H D Y

Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Apprentice Rates:

1st 6 months	\$37.00	\$46.79	\$56.59
2nd 6 months	\$38.40	\$48.89	\$59.39
3rd 6 months	\$39.80	\$50.99	\$62.19
4th 6 months	\$41.20	\$53.09	\$64.99
5th 6 months	\$42.60	\$55.19	\$67.79
final 6 months	\$44.00	\$57.29	\$70.59

Class D- Air tigger (single drum), material hoist, pump 6" or over, elevators (when operated by an operating engineer) and brokk concrete breaker	EN-324-SWW1D 9/29/2009	\$40.80	\$52.25	\$63.69	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Class E- Air compressor, welder, generators and	EN-324-SWW1E 9/29/2009	\$39.15	\$49.77	\$60.39	H H H H H H H D Y
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Class F- Oiler and Fireman	EN-324-SWW1F 9/29/2009	\$36.55	\$45.87	\$55.19	H H H H H H H D Y
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Four 10 hour days may be scheduled Monday-Thursday or Tuesday-Friday. Work not performed due to weather, Monday-Thursday may be scheduled on Friday.

Operating Engineer Underground

Class I Equipment	EN-324A2-UC1 9/10/2009	\$45.53	\$59.32	\$73.10	H H H H H H H D Y
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Apprentice Rates:

0-999 hours	\$36.76	\$46.41	\$56.06
1,000-1,999 hours	\$38.14	\$48.48	\$58.82
2,000-2,999 hours	\$39.52	\$50.55	\$61.58
3,000-3,999 hours	\$40.89	\$52.61	\$64.32
4,000-4,999 hours	\$42.27	\$54.68	\$67.08
5,000-5,999 hours	\$43.65	\$56.75	\$69.84

Class II Equipment	EN-324A2-UC2 9/10/2009	\$40.64	\$51.98	\$63.32	H H H H H H H D Y
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Class III Equipment	EN-324A2-UC3 9/10/2009	\$40.14	\$51.23	\$62.32	H H H H H H H D Y
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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class IV Equipment	EN-324A2-UC4 9/10/2009	\$39.86	\$50.81	\$61.76	H H H H H H H D Y
Painter Brush & Roll, Drywall Taping	PT-312 10/6/2009	\$31.70	\$42.08	\$52.45	H H H H H H H D Y
<p>A four 10 hour day work schedule may be used, consecutive days, Monday-Friday. A makeup day may be scheduled for missed work due to holidays or inclement weather, Monday-Friday.</p>					
Apprentice Rates:					
		0-1,000 hours	\$22.36	\$28.07	\$33.77
		1,001-2,000 hours	\$23.40	\$29.63	\$35.85
		2,001-3,000 hours	\$25.06	\$32.11	\$39.17
		3,001-4,000 hours	\$26.51	\$34.29	\$42.07
		4,001-5,000 hours	\$28.59	\$37.41	\$46.23
		5,001-6,000 hours	\$30.66	\$40.51	\$50.37
Pipe and Manhole Rehab					
General Laborer for rehab work or normal cleaning and cctv work-top man, scaffold man, CCTV assistant, jetter-vac assistant	TM247 6/16/2009	\$26.00	\$34.90		H H H H H H H H N
Tap cutter/CCTV Tech/Grout Equipment Operator: unit driver and operator of CCTV; grouting equipment and tap cutting equipment	TM247-2 6/16/2009	\$30.50	\$41.65		H H H H H H H H N
CCTV Technician/Combo Unit Operator: unit driver and operator of cctv unit or combo unit in connection with normal cleaning and televising work	TM247-3 6/16/2009	\$29.25	\$39.77		H H H H H H H H N
Boiler Operator: unit driver and operator of steam/water heater units and all ancillary equipment associated	TM247-4 6/16/2009	\$31.00	\$42.40		H H H H H H H H N
Combo Unit driver & Jetter-Vac Operator	TM247-5 6/22/2009	\$31.00	\$42.40		H H H H H H H H N
Pipe Bursting & Slip-lining Equipment Operator	TM247-6 6/22/2009	\$32.00	\$43.90		H H H H H H H H N

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Classification Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Plasterer						
Plasterer	BR9-17-PL	10/30/2009	\$37.57	\$49.39	\$61.20	H H H X X X D Y
	Apprentice Rates:					
	0-749 hours		\$29.30	\$36.98	\$44.66	
	750-1499 hours		\$30.48	\$38.75	\$47.02	
	1500-2249 hours		\$31.66	\$40.52	\$49.38	
	2250-2999 hours		\$32.84	\$42.29	\$51.74	
	3000-3749 hours		\$34.03	\$44.08	\$54.12	
	3750-4499 hours		\$35.21	\$45.84	\$56.48	
Plasterer	PL16-1	8/18/2009	\$32.36	\$43.10	\$53.84	H H H H H H D N
	Apprentice Rates:					
	1st year		\$24.84	\$31.82	\$38.80	
	2nd year		\$26.99	\$35.04	\$43.10	
	3rd year		\$29.14	\$38.27	\$47.40	
Plumber & Pipefitter						
Plumber & Pipefitter	PL-333-RIII	12/29/2009	\$51.02	\$76.33	\$101.64	H H H H H H D Y
	Four 10s allowed Monday thru Thursday. Friday not a makeup, considered OT, paid @ time & one-half.					
	Apprentice Rates:					
	1st Period		\$32.97	\$49.26	\$65.54	
	2nd Period		\$34.61	\$51.72	\$68.82	
	3rd Period		\$36.25	\$54.18	\$72.10	
	4th Period		\$37.89	\$56.64	\$75.38	
	5th Period		\$39.53	\$59.10	\$78.66	
	6th Period		\$41.17	\$61.56	\$81.94	
	7th Period		\$42.82	\$64.03	\$85.24	
	8th Period		\$44.46	\$66.49	\$88.52	
	9th Period		\$46.10	\$68.95	\$91.80	
	10th Period		\$47.74	\$71.41	\$95.08	
<u>Subdivision of county</u>	Fort Custer ONLY.					

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Classification	Name	Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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Plumber, Pipefitter & HVAC

Plumber, Pipefitter, Welder & HVAC	PL-357			\$44.50	\$59.75	\$75.00	H H H H D D D Y
An alternate workweek of 4 10 hour days may be worked Monday thru Thursday with Friday as a optional make-up day.							
M-F: The first 4 hours overtime shall be @ 1 1/2. All hours thereafter shall be @ double time.							

Apprentice Rates:

1st Year	\$24.43	\$33.12	\$41.81
2nd Year	\$26.27	\$35.88	\$45.49
3rd Year	\$34.74	\$45.11	\$55.48
4th Year	\$36.26	\$47.39	\$58.52
5th Year	\$38.10	\$50.15	\$62.20

Roofer

Commercial Roofer	RO-70-Z3			\$33.74	\$44.11	\$54.47	H H H H H H D N
3/28/2008							

Apprentice Rates:

1st Class	\$16.98	\$21.58	\$26.18
2nd Class	\$19.16	\$24.73	\$30.29
3rd Class	\$22.74	\$29.31	\$35.88
4th Class	\$24.95	\$32.50	\$40.05
5th Class	\$26.77	\$35.20	\$43.62
6th Class	\$27.95	\$36.94	\$45.92
7th Class	\$28.68	\$38.00	\$47.32

Sewer Relining

Class I-Operator of audio visual CCTV system including remote in-ground cutter and other equipment used in conjunction with CCTV system.	SR-I			\$40.32	\$54.65	\$68.97	H H H H H H D N
11/10/2009							

Class II-Operator of hot water heaters and circulation system; water jetters; and vacuum and mechanical debris removal systems and those assisting.	SR-II			\$38.79	\$52.35	\$65.91	H H H H H H D N
11/10/2009							

Sheet Metal Worker

Sheet Metal Worker 4 10s allowed as consecutive days, M-Th or T-F	SHM-7-1			\$44.97	\$58.26	\$71.55	H H H H D D D Y
9/9/2009							

Apprentice Rates:

First Year	\$24.02	\$30.67	\$37.31
Second Year	\$29.14	\$37.11	\$45.09
Third Year	\$37.00	\$46.31	\$55.61
Fourth Year	\$39.65	\$50.28	\$60.91

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Sprinkler Fitter					
Sprinkler Fitter	SP 669 9/17/2009	\$46.51	\$61.99	\$77.47	H H H H H H D Y
Apprentice Rates:					
Class 1 & 2		\$23.44	\$31.31	\$39.17	
Class 3		\$29.35	\$37.75	\$46.15	
Class 4		\$30.93	\$40.12	\$49.31	
Class 5		\$35.50	\$45.47	\$55.45	
Class 6		\$37.07	\$47.83	\$58.59	
Class 7		\$38.65	\$50.20	\$61.75	
Class 8		\$40.22	\$52.55	\$64.89	
Class 9		\$41.79	\$54.91	\$68.03	
Class 10		\$43.36	\$57.27	\$71.17	
Terrazzo, Mosaic and Marble Mechanic					
Terrazzo, Mosaic and Marble Mechanic	BR9-17-TRM 10/30/2009	\$32.43	\$44.22	\$56.01	H H H X X X D Y
Apprentice Rates:					
0-749 hours		\$24.18	\$31.85	\$39.51	
750-1499 hours		\$25.36	\$33.61	\$41.87	
1500-2249 hours		\$26.53	\$35.37	\$44.21	
2250-2999 hours		\$27.71	\$37.14	\$46.57	
3000-3749 hours		\$28.89	\$38.91	\$48.93	
3750-4499 hours		\$30.07	\$40.68	\$51.29	
Tile Finisher					
Tile Finisher	BR9-17-TF 10/30/2009	\$28.33	\$38.39	\$48.45	H H H X X X D Y
Apprentice Rates:					
0-749 hours		\$21.29	\$27.83	\$34.37	
750-1499 hours		\$22.29	\$29.33	\$36.37	
1500-2249 hours		\$23.30	\$30.85	\$38.39	
2250-2999 hours		\$24.31	\$32.36	\$40.41	
3000-3749 hours		\$25.31	\$33.86	\$42.41	
3750-4499 hours		\$26.32	\$35.37	\$44.43	
Tile Setter					
Tile Setter	BR9-17-TM 10/30/2009	\$30.93	\$41.69	\$52.44	H H H X X X D Y
Apprentice Rates:					
0-749 hours		\$23.40	\$30.39	\$37.38	
750-1499 hours		\$24.48	\$32.01	\$39.54	
1500-2249 hours		\$25.55	\$33.62	\$41.68	
2250-2999 hours		\$26.63	\$35.24	\$43.84	
3000-3749 hours		\$27.70	\$36.84	\$45.98	
3750-4499 hours		\$28.78	\$38.46	\$48.14	

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Truck Driver					
of all trucks of 8 cubic yd capacity or over	TM-RB2 9/17/2009	\$36.84	\$36.44		H H H H H H H Y
of all trucks of 8 cubic yard capacity or less	TM-RB2A 9/17/2009	\$36.74	\$36.29		H H H H H H H Y
on euclid type equipment	TM-RB2B 9/17/2009	\$36.99	\$36.66		H H H H H H H Y
Underground Laborer Open Cut, Class I					
Construction Laborer	LAUC-Z4-1 9/10/2009	\$29.19	\$38.30	\$47.41	H H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$25.01	\$32.03	\$39.05
		1,001-2,000 work hours	\$25.85	\$33.29	\$40.73
		2,001-3,000 work hours	\$26.68	\$34.54	\$42.39
		3,001-4,000 work hours	\$28.35	\$37.04	\$45.73
Underground Laborer Open Cut, Class II					
Mortar and material mixer, concrete form man, signal man, well point man, manhole, headwall and catch basin builder, guard rail builders, headwall, seawall, breakwall, dock builder and fence erector.	LAUC-Z4-2 9/10/2009	\$29.32	\$38.50	\$47.67	H H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$25.11	\$32.18	\$39.25
		1,001-2,000 work hours	\$25.95	\$33.44	\$40.93
		2,001-3,000 work hours	\$26.79	\$34.70	\$42.61
		3,001-4,000 work hours	\$28.48	\$37.24	\$45.99
Underground Laborer Open Cut, Class III					
Air, gasoline and electric tool operator, vibrator operator, drillers, pump man, tar kettle operator, bracers, rodder, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars, etc.), cement finisher, welder, pipe jacking and boring man, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tigger man, and directional boring man.	LAUC-Z4-3 9/10/2009	\$29.43	\$38.66	\$47.89	H H H H H H H D Y
Apprentice Rates:					
		0-1,000 work hours	\$25.19	\$32.30	\$39.41
		1,001-2,000 work hours	\$26.04	\$33.58	\$41.11
		2,001-3,000 work hours	\$26.89	\$34.85	\$42.81
		3,001-4,000 work hours	\$28.58	\$37.38	\$46.19

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Classification Name Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Underground Laborer Open Cut, Class IV					
Trench or excavating grade man.	LAUC-Z4-4	\$29.50	\$38.77	\$48.03	H H H H H H D Y
	9/10/2009				
Apprentice Rates:					
0-1,000 work hours		\$25.24	\$32.38	\$39.51	
1,001-2,000 work hours		\$26.09	\$33.65	\$41.21	
2,001-3,000 work hours		\$26.95	\$34.94	\$42.93	
3,001-4,000 work hours		\$28.65	\$37.49	\$46.33	
Underground Laborer Open Cut, Class V					
Pipe Layer	LAUC-Z4-5	\$29.62	\$38.95	\$48.27	H H H H H H D Y
	9/10/2009				
Apprentice Rates:					
0-1,000 work hours		\$25.33	\$32.51	\$39.69	
1,001-2,000 work hours		\$26.19	\$33.80	\$41.41	
2,001-3,000 work hours		\$27.05	\$35.09	\$43.13	
3,001-4,000 work hours		\$28.76	\$37.66	\$46.55	
Underground Laborer Open Cut, Class VI					
Grouting man, top man assistant, audio visual television operations and all other operations in connection with closed circuit television inspection, pipe cleaning and pipe relining work & the installation and repair of water service pipe and appurtenances.	LAUC-Z4-6	\$26.84	\$34.78	\$42.71	H H H H H H D Y
	9/10/2009				
Apprentice Rates:					
0-1,000 work hours		\$23.25	\$29.39	\$35.53	
1,001-2,000 work hours		\$23.97	\$30.47	\$36.97	
2,001-3,000 work hours		\$24.68	\$31.54	\$38.39	
3,001-4,000 work hours		\$26.12	\$33.70	\$41.27	
Underground Laborer Open Cut, Class VII					
Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes, flagstones etc.	LAUC-Z4-7	\$25.18	\$32.29	\$39.39	H H H H H H D Y
	9/10/2009				
Apprentice Rates:					
0-1,000 work hours		\$22.00	\$27.52	\$33.03	
1,001-2,000 work hours		\$22.64	\$28.48	\$34.31	
2,001-3,000 work hours		\$23.27	\$29.42	\$35.57	
3,001-4,000 work hours		\$24.54	\$31.32	\$38.11	

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ENGINEERS - CLASSES OF EQUIPMENT LIST

UNDERGROUND ENGINEERS

CLASS I

Backfiller Tamper, Backhoe, Batch Plant Operator, Clam-Shell, Concrete Paver (2 drums or larger), Conveyor Loader (Euclid type), Crane (crawler, truck type or pile driving), Dozer, Dragline, Elevating Grader, End Loader, Gradall (and similar type machine), Grader, Power Shovel, Roller (asphalt), Scraper (self propelled or tractor drawn), Side Broom Tractor (type D-4 or larger), Slope Paver, Trencher (over 8' digging capacity), Well Drilling Rig, Mechanic, Slip Form Paver, Hydro Excavator.

CLASS II

Boom Truck (power swing type boom), Crusher, Hoist, Pump (1 or more 6" discharge or larger gas or diesel powered by generator of 300 amps or more, inclusive of generator), Side Boom Tractor (smaller than type D-4 or equivalent), Tractor (pneu-tired, other than backhoe or front end loader), Trencher (8' digging capacity and smaller), Vac Truck.

CLASS III

Air Compressors (600 cfm or larger), Air Compressors (2 or more less than 600 cfm), Boom Truck (non-swinging, non-powered type boom), Concrete Breaker (self-propelled or truck mounted, includes compressor), Concrete Paver (1 drum, ½ yard or larger), Elevator (other than passenger), Maintenance Man, Mechanic Helper, Pump (2 or more 4" up to 6" discharge, gas or diesel powered, excluding submersible pump), Pumpcrete Machine (and similar equipment), Wagon Drill Machine, Welding Machine or Generator (2 or more 300 amp or larger, gas or diesel powered).

CLASS IV

Boiler, Concrete Saw (40HP or over), Curing Machine (self-propelled), Farm Tractor (w/attachment), Finishing Machine (concrete), Firemen, Hydraulic Pipe Pushing Machine, Mulching Equipment, Oiler (2 or more up to 4", exclude submersible), Pumps (2 or more up to 4" discharge if used 3 hrs or more a day-gas or diesel powered, excluding submersible pumps), Roller (other than asphalt), Stump Remover, Vibrating Compaction Equipment (6' wide or over), Trencher (service) Sweeper (Wayne type and similar equipment), Water Wagon, Extend-a-Boom Forklift.

HAZARDOUS WASTE ABATEMENT ENGINEERS

CLASS I

Backhoe, Batch Plant Operator, Clamshell, Concrete Breaker when attached to hoe, Concrete Cleaning Decontamination Machine Operator, Concrete Pump, Concrete Paver, Crusher, Dozer, Elevating Grader, Endloader, Farm Tractor (90 h.p. and higher), Gradall, Grader, Heavy Equipment Robotics Operator, Hydro Excavator, Loader, Pug Mill, Pumpcrete Machines, Pump Trucks, Roller, Scraper (self-propelled or tractor drawn), Side Boom Tractor, Slip Form Paver, Slope Paver, Trencher, Ultra High Pressure Waterjet Cutting Tool System Operator, Vactors, Vacuum Blasting Machine Operator, Vertical Lifting Hoist, Vibrating Compaction Equipment (self-propelled), and Well Drilling Rig.

CLASS II

Air Compressor, Concrete Breaker when not attached to hoe, Elevator, End Dumps, Equipment Decontamination Operator, Farm Tractor (less than 90 h.p.), Forklift, Generator, Heater, Mulcher, Pigs (Portable Reagent Storage Tanks), Power Screens, Pumps (water), Stationary Compressed Air Plant, Sweeper, Water Wagon and Welding Machine.

Revised: 05/23/08

Michigan Department Energy, Labor & Economic Growth
Wage & Hour Division
Overtime Provisions for MICHIGAN PREVAILING WAGE RATE
COMMERCIAL SCHEDULE

1. Overtime is represented as a nine character code. Each character represents a certain period of time after the first 8 hours Monday thru Friday.

	Monday thru Friday	Saturday	Sunday & Holidays	Four 10s
First 8 Hours		4	8	9
9th Hour	1	5		
10th Hour	2	6		
Over 10 hours	3	7		

Overtime for Monday thru Friday after 8 hours:

the 1st character is for time worked in the 9th hour (8.1 - 9 hours)
the 2nd character is for time worked in the 10th hour (9.1 - 10 hours)
the 3rd character is for time worked beyond the 10th hour (10.1 and beyond)

Overtime on Saturday:

the 4th character is for time worked in the first 8 hours on Saturday (0 - 8 hours)
the 5th character is for time worked in the 9th hour on Saturday (8.1 - 9 hours)
the 6th character is for time worked in the 10th hour (9.1 - 10 hours)
the 7th character is for time worked beyond the 10th hour (10.01 and beyond)

Overtime on Sundays & Holidays

The 8th character is for time worked on Sunday or on a holiday

Four Ten Hour Days

The 9th character indicates if an optional 4-day 10-hour per day workweek can be worked **between Monday and Friday without paying overtime after 8 hours worked, unless otherwise noted in the rate schedule. To utilize a 4 ten workweek, notice is required from the employer to employee prior to the start of work on the project.**

2. Overtime Indicators Used in the Overtime Provision:

H - means TIME AND ONE-HALF due
X - means TIME AND ONE-HALF due after 40 HOURS worked
D - means DOUBLE PAY due
Y - means YES an optional 4-day 10-hour per day workweek can be worked without paying overtime after 8 hours worked
N - means NO an optional 4-day 10-hour per day workweek *can not* be worked without paying overtime after 8 hours worked

3. EXAMPLES:

HHHHHHHDN - This example shows that the 1½ rate must be used for time worked after 8 hours Monday thru Friday (characters 1 - 3); for all hours worked on Saturday, 1½ rate is due (characters 4 - 7). Work done on Sundays or holidays must be paid double time (character 8). The N (character 9) indicates that 4 ten-hour days is not an acceptable workweek at regular pay.

XXXHHHHHDY - This example shows that the 1½ rate must be used for time worked after 40 hours are worked Monday thru Friday (characters 1-3); for hours worked on Saturday, 1½ rate is due (characters 4 - 7). Work done on Sundays or holidays must be paid double time (character 8). The Y (character 9) indicates that 4 ten-hour days is an acceptable alternative workweek. (REV 09/29/09)