



PUBLIC IMPROVEMENT PROJECT

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

FORMAL BID

CONTRACT DOCUMENTS MANUAL

THE IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) 2023 EDITION,
APPLY TO THIS PROJECT. THEY AVAILABLE ONLINE AT:

<https://iowasudas.org/archived-specifications/>

CITY OF DUBUQUE SUPPLEMENTAL SPECIFICATIONS 2023 EDITION,
APPLY TO THIS PROJECT. AVAILABLE ONLINE AT:

<https://www.cityofdubuque.org/DocumentCenter/View/55134/2023-SUDAS-City-of-Dubuque-Supplemental-Specifications>

~~CITY OF DUBUQUE 2019 STREET LIGHTS & TRAFFIC SIGNAL SUPPLEMENTAL SPECIFICATIONS,
SHALL APPLY TO THIS PROJECT. THEY ARE AVAILABLE ONLINE AT:~~

~~<http://www.cityofdubuque.org/DocumentCenter/View/18094>~~

~~CITY OF DUBUQUE 2011 WATER DISTRIBUTION DIVISION STANDARDS & SPECIFICATIONS FOR WATER MAINS
AND APPURTENANCES, SHALL APPLY TO THIS PROJECT. THEY ARE AVAILABLE ONLINE AT:~~

~~<http://www.cityofdubuque.org/DocumentCenter/View/15529>~~



CITY OF DUBUQUE
ENGINEERING DEPARTMENT
DUBUQUE, IA



Date Issued: June 19, 2026

PROJECT DIRECTORY PAGE

SECTION 00101

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

**11 W. 9th Street
Dubuque, IA 52001**

101.1 Authorized Parties:

The following contacts are the authorizing representatives for each of the parties, if a change is to be made to the Contract the following representatives must be contacted and approve of the change.

<p>JURISDICTION/GOVERNMENT ENTITY REPRESENTATIVE City of Dubuque City Hall, 50 West 13th Street Dubuque, Iowa 52001</p> <p><u>Project Contact:</u> Name: Jim Bousley Title: Project Manager Department: Engineering Email: jbousley@cityofdubuque.org Phone: 563.589.4270</p>	<p>ENGINEER City of Dubuque City Hall, 50 West 13th Street Dubuque, Iowa 52001</p> <p><u>Project Contact:</u> Name: Bob Schiesl, PE Title: Assistant City Engineer Department: Engineering Email: bschiesl@cityofdubuque.org Phone: 563.589.4270</p>
<p>ARCHITECT'S REPRESENTATIVE FEH Design 951 Main Street Dubuque, IA 52001</p> <p><u>Project Contact:</u> Name: Chris Wand, AIA Title: Principal / Architect Email: chrisw@fehdesign.com Phone: 563.599.6800</p>	<p>ENGINEER'S REPRESENTATIVE Design Engineers 8801 Prairie View Lane SW, Suite 200 Cedar Rapids, IA 52404</p> <p><u>Project Contact:</u> Name: Nick Rolling, P.E. Title: Mechanical Engineer Email: nick.rolling@designengineers.com Phone: 319.841.1944</p>

==== END OF SECTION 00101 ====

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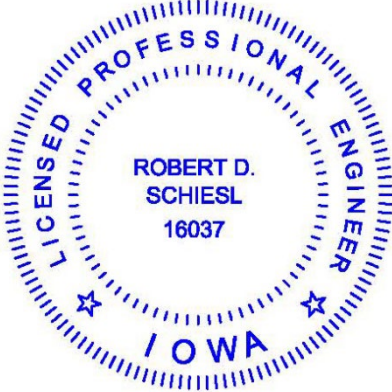

PROJECT CERTIFICATION PAGE

SECTION 00102


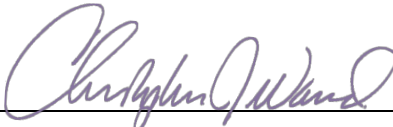
DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

Dubuque, IA 52001

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered Engineer under the laws of the State of Iowa.

		
	Robert Schiesl, PE	06-19-2026
		Signing Date
	Iowa PE 16037	12-31-2027
	Iowa License No.	Renewal Date
Pages or sheets covered by this certification: City Front End Documents		

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered Architect under the laws of the State of Iowa.

		
	Christopher J. Wand	06-19-2026
		Date
	05132	06-30-2027
	Iowa License No.	Renewal Date
Pages or sheets covered by this certification: Project Manual Divisions: 02 – 14 Drawing Sheets: “AG” Sheets, “AD” Sheets, “A” Sheets		

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly registered Engineer under the laws of the State of Iowa.



	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p> 2026.06.16</p> <p>_____ JONATHAN CHARLES GETTLER Date Iowa Registration No. 19966 My license renewal date is December 31, 2027. Pages or sheets covered by this seal: DIV 22, DIV 26 _____ _____</p>
Seal	

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==== END OF SECTION 00110 ====

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NOTICE TO BIDDERS
SECTION 00120

CITY OF DUBUQUE PUBLIC IMPROVEMENT PROJECT

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT
Dubuque, IA 52001

120.1 Time and Place for Filing Sealed Proposals

Sealed Bids for the work comprising each improvement as stated below must be filed before 2:00 p.m. on Thursday, July 9, 2026, in the Office of the City Clerk, City Hall - First Floor, 50 West 13th Street, Dubuque, Iowa.

120.2 Time and Placed Sealed Proposals Will be Opened and Considered

Sealed proposals will be opened, and Bids tabulated at 2:00 p.m. Thursday, July 9, 2026, at City Hall - Conference Room B, 50 West 13th Street, Dubuque, Iowa, for consideration by the City Council at its meeting on Monday, July 20, 2026. The City of Dubuque, Iowa, reserves the right to reject any and all Bids.

120.3 Time for Commencement and Completion of Work

Work on the Project must be commenced within ten (10) calendar days after the Notice to Proceed has been issued and shall be completed by November 20, 2026.

120.4 Bid Security

Each Bidder must accompany its Bid with a Bid security as security that the successful Bidder will enter into a contract for the work Bid upon and will furnish after the award of contract a corporate surety Bond, acceptable to the governmental entity, for the faithful performance of the contract, in an amount equal to one hundred percent (100%) of the amount of the contract. The Bid security must be in the amount of ten percent (10%) of the amount of the contract and must be in the form of a cashier's check or certified check drawn on a state-chartered or federally chartered bank, or a certified share draft drawn on a state-chartered or federally chartered credit union, or the Bidder may provide a Bid Bond with corporate surety satisfactory to the governmental entity. The Bid Bond must contain no conditions except as provided in this section.

120.5 Contract Documents

Copies of the Contract Documents may be obtained at the Engineering Department, City Hall – Second Floor, 50 West 13th Street, Dubuque, Iowa 52001. The Contract Documents will also be available on the City's website at www.cityofdubuque.org/bids.aspx. No plan deposit is required.

120.6 Preference for Iowa Products and Labor

By virtue of statutory authority, preference will be given to products and provisions grown and coal produced within the State of Iowa, and to Iowa domestic labor, to the extent lawfully required under Iowa statutes.

120.7 Sales Tax

The Bidder should not include State of Iowa sales tax in its Bid. A sales tax exemption certificate will be available for all material purchased in Iowa for incorporation into the Project.

120.8 General Nature of Public Improvement Project

Project: Dubuque Fire Headquarters Bunkroom Remodel Project
Location: 11 W. 9th Street, Dubuque, Iowa
Project Number: 1315000025

The scope of the Project is as follows: Remodel of existing second floor including removal plumbing fixtures, walls, doors, ceilings, and tile flooring in existing group shower/restrooms; removal of existing lockers and integral bases; removal of one fire pole and enclosing of associated floor opening; construction of new individual shower/restrooms in location of former restrooms and individual sleeping rooms in locations of former bunkrooms and locker room; upgrades to existing hot water system; installation of electrical, lighting, and fire alarm devices associated with aforementioned new construction.

120.9 Title VI – Non-Discrimination Clause

The City of Dubuque in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d-2000d-4 hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age, or disability in consideration for an award.

120.10 Target Small Business (TSB)

Targeted Small Businesses (TSB) Affirmative Action Responsibilities for Non-federal aid Projects are not applicable and will **NOT** be in effect for this Project.

120.11 Disadvantaged Business Enterprise (DBE)

Disadvantaged Business Enterprise (DBE) Policy Requirements are not applicable and will **NOT** be in effect for this Project.

120.12 Federal Prevailing Wage Rate

Davis-Bacon Federal Prevailing Wage Act and related labor requirements and regulations are not applicable and will **NOT** be in effect for this Project.

120.13 Pre-Bid Construction Conference

Each prospective bidder is encouraged to attend the Pre-Bid Construction Conference to be held at 10:00 AM on June 25, 2026, onsite at 11 W. 9th Street, Dubuque, Iowa. Attendance by all prospective bidders is not mandatory but highly recommended.

On **June 19, 2026**, this notice was posted at the following locations:

1. Posted on the City of Dubuque Website: www.cityofdubuque.org/bids
2. Posted to Master Builders of Iowa Construction Update Network: www.mbsonline.com

==== END OF SECTION 00120 ====

INSTRUCTIONS TO BIDDERS

SECTION 00200

200.1 CONTRACT DOCUMENTS

Copy of the Contract Documents may be viewed at the Engineering Department, City Hall – Second Floor, 50 West 13th Street, Dubuque, Iowa 52001. The Contract Documents in PDF format will be available on the City's website at www.cityofdubuque.org/bids.aspx. No Plan Deposit is required.

200.2 EXAMINATION

Bidders must use complete sets of Contract Documents in preparing Bids. Bidders must examine the Contract Documents and the construction site to obtain first-hand knowledge of existing conditions. Extra compensation will not be given for conditions that can be determined by examining the Contract Documents and site.

200.3 QUESTIONS AND INTERPRETATIONS

Bidders must submit questions about the Contract Documents to the Project Manager in writing or by email only. Replies will be issued to Contract Document holders of record as Addenda to the Drawings and Specifications and will become part of the Contract Documents. Neither City nor a Bidder may rely on oral clarification.

Failure to request clarification will not waive the responsibility of comprehension of the Contract Documents and performance of the work in accordance with the intent of the documents. Signing of the Bid Proposal constitutes an acknowledgement of understanding of the Contract Documents.

200.4 PRODUCT OPTIONS

To obtain approval to use an unspecified product, a Bidder must deliver written requests to the Project Manager at least seven (7) working days before the sealed Bid is due. Late requests will not be considered. The Bidder must submit request using the Substitution Request Form in specification 00270. Be sure to clearly describe and indicate the product for which approval is requested and include any data as necessary to demonstrate acceptability of the substitute product. The written request must indicate the section number, page number and line number of the Specification for the product. If the product is acceptable, the Project Manager will include it in an Addendum.

200.5 INSPECTION OF THE PROJECT SITE

Due to the restrictions on access to the project site, bidders are encouraged to take advantage of the pre-bid conference to inspect the project site of the proposed work to fully acquaint themselves with the existing conditions relating to the project and inform themselves as to the facilities involved, the difficulties and the restrictions related to the performance of the Contract. Bidders should assume that additional opportunities to visit the project site may not be possible. Each Bidder must thoroughly examine and familiarize itself with the specifications and all other Contract Documents. The Contractor by the execution of the Contract shall in no way be relieved of any obligation

under the contract due to Contractor's failure to receive or examine any contract document or to visit the site and acquaint itself with the conditions there existing during the pre-bid conference. City will be justified in rejecting any claim based on facts regarding which the Contractor should have been aware of as a result of its inspection.

200.6 RELEASE OF SITE: SEQUENCE OF WORK

Bidders are referred to the Contract Documents for information regarding the manner in which the project site will be released and made available for construction purposes, and the sequence in which the construction work will be performed.

200.7 PREPARATION OF BIDS

1. All Bids must be submitted on the Bid Proposal Form (SECTION 00400) supplied by the City and bound in this Contract Documents Manual. All Bids are subject to all requirements of the Contract Documents including these INSTRUCTIONS TO BIDDERS. All Bids must be regular in every respect, and no modifications, exclusions, or special conditions shall be made or included in the Bid Proposal Form by the Bidder.
2. The Bid Proposal Form (SECTION 00400) and Bid Bond (SECTION 00450) must be enclosed in separate sealed envelopes and clearly labeled.

- a. THE ENVELOPE CONTAINING THE BID PROPOSAL FORM MUST BE LABELED AS FOLLOWS:

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

Sealed Bid

Bidder / Contractor Name

And addressed to Location for Filing Bid:

City of Dubuque

Office of the City Clerk

City Hall, 50 W 13th Street

Dubuque, Iowa, 52001

- b. THE ENVELOPE CONTAINING THE BID BOND MUST BE LABELED AS FOLLOWS:

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

Bid Bond

Bidder / Contractor Name

And addressed to Location for Filing Bid:

City of Dubuque

Office of the City Clerk

City Hall, 50 W 13th Street

Dubuque, Iowa, 52001

3. The Bidder Status Form (Section 00460) must be included in the envelope with the Bid.
4. Bids submitted after the date and time for filing sealed proposals as listed in the Notice to Bidders (SECTION 00120) shall not be considered and will be returned to the Bidder unopened.

5. The City may reject any irregular or non-responsive Bid.
6. If the Contract is awarded, it will be awarded by the City as required by law to the lowest responsive, responsible Bidder. The Contract will require the completion of work according to the Contract Documents.
7. Each Bidder must include in the Bid, in the appropriate spaces therefore, the proposed cost of performing said work in compliance with the Contract Documents including all items of labor, equipment, materials and overhead costs.

200.8 BID BOND

Each Bid must be accompanied by a satisfactory Bid Bond (SECTION 00450), in a separate envelope and clearly labeled in the same manner as the Bid proposal forms, executed by the Bidder and an acceptable surety; or a cashier's or certified check payable to the City Treasurer, City of Dubuque, drawn on a bank in Iowa or a bank chartered under the laws of the United States, in the amount of ten percent (10%) of the Bid submitted as security that the Bidder will enter into a contract for doing the work and will give Bond with proper securities for the faithful performance of the contract in the form attached to the specifications.

Bidders shall use the provided City of Dubuque Bid Bond (SECTION 00450). If an alternative Bid Bond form is submitted by the Bidder and determined by the City to not be an equivalent bond form then the City may determine the Bid as non-responsive.

200.9 BIDDER STATUS FORM

The Bidder Status Form (Section 00460) is required by the Iowa Labor Commissioner, pursuant to the Iowa Administrative Code rule 875-156.2(1). The Bidder must complete and submit the Bidder Status Form, signed by an authorized representative of the Bidder, with their Bid proposal. Under Iowa Administrative Code rule 875-156.2(1), failure to provide the Bidder Status Form with the Bid may result in the Bid being deemed non-responsive and may result in the Bid being rejected.

200.10 CORRECTIONS

Erasures or other changes in the Bid must be explained or noted and initialed by the Bidder.

200.11 TIME FOR RECEIVING BIDS

Bids received prior to the time of opening will be securely kept unopened. The officer whose duty it is to open them will decide when the specified time has arrived, and no Bid received thereafter will be considered.

200.12 OPENING OF BIDS

At the time and place fixed for the opening of Bids, the City will cause to be opened and publicly read aloud every qualifying Bid received within the time set for receiving Bids, irrespective of any irregularities therein. Bidders and other persons interested may be present in person or by representative.

200.13 WITHDRAWAL OF BIDS

Bids (received prior to the time fixed for opening) may be withdrawn on written request by the Bidder. The Bid Bond of any Bidder withdrawing its Bid in accordance with the foregoing conditions will be returned with the Bid.

200.14 CONTRACTOR BACKGROUND INFORMATION FORM

If at the discretion and upon request of the City, the Contractor Background Information Form (Section 00471) must be submitted by the apparent low bidder within 72 hours after the bid opening. The Form may be submitted to the City by either delivering a hardcopy or by email to the Jurisdiction/Government Entity Representative.

200.15 AWARD OF CONTRACTS AND REJECTION OF BIDS

The Public Improvement Contract (SECTION 00500) shall be awarded as required by law. The Bidder to whom the award is made shall be notified at the earliest possible date by a Notice of Award. Failure by the apparent low bidder to provide the Contractor Background Information Form within the period specified in Section 200.14 or within such extended period as the City may grant, based upon reasons determined sufficient by the City, shall be grounds for determining the apparent low bidder as not responsible, and the City may either award the Contract to another Bidder or re-advertise for Bids, and may charge against the defaulting Bidder the difference between the defaulting Bidder's Bid and the successful Bid, irrespective of whether the amount thus due exceeds the amount of the Bid Bond.

200.16 EXECUTION OF CONTRACT

1. Within ten (10) calendar days after the date of the City's Notice of Award, the successful Bidder shall execute and deliver to the City a Contract (SECTION 00500) in the form included in the Contract Documents in such number of copies as the City may require.
2. Insurance documents shall be submitted in accordance with SECTION 00700 and must be properly completed prior to execution of the contract by the City.
3. Iowa Sales Tax Exemption Certificate documents shall be submitted in accordance with SECTION 00750 and must be properly completed prior to execution of the contract by the City.
4. The successful Bidder shall, within the period specified in Section 00200.16 Paragraph 1 above, also furnish a Contractor's Performance, Payment and Maintenance Bond in the form included in the Contract Documents and shall bear the same date as, or a date subsequent to, the date of the Contract. The power of attorney for the person who signs for any surety company shall be attached to such Bond.
5. The failure of the successful Bidder to execute such Contract and to supply the required Bond(s), Insurance, and Iowa Sales Tax Exemption Certificate information within ten (10) calendar days after the date of City's Notice of Award, or within such extended period as the City may grant, based upon reasons determined sufficient by the City, shall constitute a default, and the City may either award the Contract to another Bidder or re-advertise for Bids, and may charge against the defaulting Bidder the difference between the defaulting Bidder's Bid and the successful Bid, irrespective of whether the amount thus due exceeds the amount

of the Bid Bond. If a more favorable Bid is received by re-advertising, the defaulting Bidder shall have no claim against the City for a refund.

6. After the Contract, Bonds, Insurance Documents, Sales Tax Exemption Certificate Form and Contractor Background Information Form have been properly provided, the City will execute the contract and issue the Notice to Proceed.

==== END OF SECTION 00200 ====

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SUBSTITUTION REQUEST FORM

SECTION 00270

270.1 PROJECT INFORMATIONPROJECT: **DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT**

SUBMIT REQUESTS FOR SUBSTITUTIONS DURING THE BIDDING PHASE TO:

<p>PROJECT MANAGER City of Dubuque City Hall, 50 West 13th Street Dubuque, Iowa 52001</p> <p><u>Project Contact:</u> Name: Jim Bousley Title: Project Manager Department: Engineering Email: jbousley@cityofdubuque.org Phone: 563.589.4270</p>	
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SUBMISSION DATE: ____/____/____

REQUEST FROM: _____

1. SPECIFICATION SECTION

SPEC. SEC. NO: _____

SPEC. SEC. TITLE: _____

DESCRIPTION: _____

ARTICLE: _____

PARAGRAPH: _____

2. PROPOSED SUBSTITUTION

MANUFACTURER: _____

TRADE NAME: _____

MODEL: _____

270.2 ACKNOWLEDGEMENTS AND ATTACHMENTS

In submitting this Request, the undersigned acknowledges and represents that:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay the project schedule.
- Proposed substitution does not affect dimensions and functional clearances.

Attachments: The following attachments are required as part of this submittal request.

1. _____ Product Data, descriptions, and specifications necessary for evaluation.
2. _____ Drawings necessary to indicate proper installation in the Work.
3. _____ Tests and Reports consistent with specified performance.
4. _____ Material Samples (if applicable): _____

SUBMITTED BY: _____

TITLE: _____

COMPANY NAME: _____

PHONE / MOBILE: _____

EMAIL: _____

270.3 ARCHITECT'S/ENGINEER'S REVIEW AND ACTION

_____ Substitution approved - Make submittals in accordance with Specification Section for this item.

_____ Substitution rejected - Revise and Resubmit.

_____ Substitution rejected - Use specified materials.

REVIEWED BY: _____

DATE: ____/____/____

==== END OF SECTION 00270 ====

BID PROPOSAL SUBMITTAL CHECKLIST

SECTION 00300

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

300.1 Bid Submittal Check List

Checking your Bid submittal, before filing, against the following checklist will help prevent minor errors or omissions, which could result in rejection of the Bid because it is non-responsive.

1. Bid Proposal Form:

- ✓ Bid proposal must be submitted on the form listed below and provided by the City:
 - BID PROPOSAL FORM (SECTION 00400)
- ✓ Acknowledge receipt of all addenda on the Bid Proposal Form (SECTION 00400).
- ✓ Bid Proposal Form (SECTION 00400) must be signed by an authorized agent.
- ✓ The Bid Proposal Form must not be qualified in any way or contain any disclaimers or special conditions, or the Bid may be found non-responsive.

2. Bid Bond:

- ✓ The Bid Proposal Form (SECTION 00400) must be accompanied in a separate envelope by a Bid Bond (SECTION 00450) or a certified check made payable to the "City of Dubuque" in an amount equal to ten percent (10%) of the Bid amount.
- ✓ The Bid Bond (SECTION 00450), if used, must be signed by both the Bidder and the Surety or surety's agent. Signature of surety's agent must be supported by accompanying power of attorney. Be sure to write in the bid amount on the Bid Bond
- ✓ **Bidders shall use the provided City of Dubuque Bid Bond (SECTION 00450). If an alternative Bid Bond form is submitted by the Bidder and determined by the City to not be an equivalent bond form then the City may determine the Bid as non-responsive.**

3. Bidder Status Form:

- ✓ The Bidder Status Form (Section 00460) must be included in the envelope with the Bid.

4. Submittal of Bid:

- ✓ The Bid Proposal Form and Bid Bond must be submitted in separate sealed envelopes labeled as follows:

DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

“Sealed Bid” or “Bid Bond”

Bidder / Contractor Name

And addressed to this location for filing the Bid:

City of Dubuque
Office of the City Clerk
City Hall, 50 W 13th Street
Dubuque, Iowa, 52001

- ✓ Sufficient time should be allowed for Bids to be delivered. Late Bids will not be considered and will be returned unopened.

== == END OF SECTION 00300 ====

BID PROPOSAL FORM
SECTION 00400

PROJECT: DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

BID TO: City of Dubuque
Office of the City Clerk
City Hall, 50 W 13th Street
Dubuque, Iowa, 52001

BID PROPOSAL FROM:

(Bidder / Company Name)

(Street Address)

(City, State, Zip)

(Phone / Mobile)

400.1 General

The undersigned Bidder agrees, if the Bid is accepted, to enter into a Public Improvement Contract with the City of Dubuque, in the form included in the Contract Documents, to perform and furnish the Work as specified or indicated in the Contract Documents and Settlement Remediation Work Plan Proposal for the Total Bid Amount and within the Completion Time indicated in the Contract Documents and in accordance with other terms and conditions of the Contract Documents.

400.2 Recitals

In submitting this Bid Proposal, Bidder represents, as more fully set forth in the Public Improvement Contract, that:

- a. This Bid Proposal will remain subject to acceptance for forty-five (45) calendar days after the day of Bid opening; and
- b. The City has the right to reject this Bid Proposal and to waive any informalities in the Bidding; and
- c. Bidder accepts the provisions to the Instructions to Bidders regarding dispositions of Bid Security; and
- d. Bidder will sign and submit the Public Improvement Contract with the Bond and other documents required by the Contract Documents within ten (10) calendar days after the date of City's Notice of Award;

- e. The Bidder hereby certifies that the Bidder is the only person or persons interested in this proposal as principals; that an examination has been made of the plans, specifications, contract form, including the special provision contained herein, and the work site, the Bidder proposes to furnish all necessary machinery, equipment, tools, labor and other means of construction, and to furnish all materials specified in the manner and time prescribed and to do the work at the prices herein set out.

400.3 Bidder's Acknowledgment

In submitting this Bid this Bidder acknowledges and represents that:

1. Bidder has examined copies of all the Contract Documents.
2. Bidder has visited the Project Area and or is familiar with the general, local, and site conditions.
3. Bidder is familiar with Federal, State, and local laws, ordinances and regulations that govern the work specified by the Contract Documents.
4. Bidder has correlated the information known to the Bidder, observations obtained from the examination of the site, reports and drawings identified in the Contract Documents and additional investigations, explorations, tests, studies, and data within the Contract Documents.
5. This Bid is genuine and not made in the interest of or on behalf of an undisclosed person, firm or corporation; Bidder has not directly or indirectly induced or solicited another Bidder to submit a false or sham Bid; Bidder has not solicited or induced a person, firm or corporation to refrain from Bidding; and Bidder has not sought by collusion to obtain for itself an advantage over another Bidder or over City.
6. Local and State sales and use taxes are not included in the Bid Amount.
7. Bidder has examined and understands that the following reports listed in Section 00775 are part of the Contract Documents have been considered and are included in the Bid Amount.

Report Title _____ Dated _____

Report Title _____ Dated _____

Report Title _____ Dated _____

400.4 Base Bid Amount – Lump Sum

Bidder will complete the work in accordance with the Contract Documents for the following:

Lump Sum Bid Amount \$ _____ (Numeric Value)

Type Lump Sum Bid Amount: _____

_____ (use words)

Any written exclusions on the Bid Form may render the Bid as nonresponsive and may result in a rejection of the Bid by the City.

400.5 Timeliness

Bidder agrees that the work shall be Substantially Complete and made ready for final payment in accordance with Contract Documents no later than the date(s) indicated in Section 00800 - Construction Schedule and Agreed Cost of Delay.

400.6 Additional Documents To Be Submitted With Bid

The following additional documents are included and made a condition of this Bid:

A. Bid Bond (Section 00450) or other approved Bid Security.

Accompanying this Bid in a separate sealed envelope is a Bid Bond, cashier's check, or certified check in the penal sum of ten percent (10%) of the submitted Bid. It is understood that the Bid security will be retained in the event a contract is not executed by the Contractor if award is made to the undersigned. If a Bid Bond is submitted, it must be executed by the Bidder and acceptable corporate surety. If a Cashier's check or certified check is submitted it must be made payable to the City Treasurer, City of Dubuque, drawn on a bank in Iowa or a bank chartered under the laws of the United States.

B. Bidder Status Form (Section 00460)

400.7 Document Submittal Requirements by Apparent Low Bidder

If at the discretion and upon request of the City, the Contractor Background Information Form (Section 00471) must be submitted by the apparent low bidder within 72 hours after the bid opening. The Form may be submitted to the City by either delivering a hardcopy or by email to the Jurisdiction/Government Entity Representative.

400.8 Contract Execution

The Bidder further agrees to execute a formal contract and Bond, within ten (10) calendar days after the date of the City's Notice of Award. The Bidder also agrees it will commence work on or before ten (10) calendar days after the date of City's Notice to Proceed, and it will complete the work within the specified contract period or pay the Agreed Cost of Delay stipulated in the Contract Documents.

400.9 Questions and Interpretations

Failure by the Bidder to request clarification of the Contract Documents during the bidding process does not waive the responsibility for comprehension of the documents and performance of the work in accordance with the Contract Documents. Signing of the Bid Proposal Form constitutes the Contractor's certification as implicitly denoting thorough comprehension of intent of the Contract Documents.

400.10 Addenda

The Bidder acknowledges receipt of the following Pre-Bid Addenda:

ADDENDUM NO. _____ Dated _____

ADDENDUM NO. _____ Dated _____

ADDENDUM NO. _____ Dated _____

ADDENDUM NO. _____ Dated _____

400.11 Signatures

Contractor:

Bidder / Contractor / Company Name

Dated

Street Address (Business Location)

City, State, Zip

Authorized Signature

Dated

Title

The Bidder's State of _____ does (____) OR does not (____) utilize a percentage preference for in-state Bidders. If YES, the amount of preference is _____ percent.

==== END OF SECTION 00400 ===

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BID BOND
SECTION 00450

We _____ as Principal (Contractor), and _____, as Surety, are held and firmly bound unto the City of Dubuque, Iowa (City), in the sum of \$ _____ (10% of the Bid amount), for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. The condition of this obligation is such that whereas the Principal has submitted the accompanying Bid, dated _____ day of _____, 2026 for the **DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT** (Project).

NOW, THEREFORE, if the Principal shall not withdraw said Bid within the period specified therein during the opening of same, or if no period specified, within thirty (30) days after said opening, and must within the period specified therefore, if no period be specified, within ten (10) days after date of City's Notice of Award, enter into a the Public Improvement Contract with the City, in accordance with the Bid as accepted, and give Bond with good and sufficient surety or sureties, as may be required for the faithful performance and proper fulfillment of such Contract, then the above obligation shall be void and of no effect, otherwise to remain in full force.

The full amount of this Bid Bond will be forfeited to the City as an Agreed Cost of Delay in the event that the Principal fails to execute the contract and provide the Bond as provided in the Contract Documents or by law.

IN WITNESS WHEREOF, the above parties have executed this instrument under their several seals this _____ day of _____, 2026 the name and corporate seal of each corporate party being hereto affixed and duly signed by its undersigned representative pursuant to authority of its governing body.

PRINCIPAL:**SURETY:**_____
Contractor Name_____
Surety Name

By: _____

Signature

By: _____

Signature_____
Title_____
Title_____
Date_____
Date

==== END OF SECTION 00450 ====

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Bidder Status Form**SECTION 00460*****To be completed by all Bidders******Part A***

Please answer "Yes" or "No" for each of the following:

- ☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- ☐ Yes ☐ No My company has an office to transact business in Iowa.
- ☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- ☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for Bids on this project.
- ☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident Bidder in Iowa.
- If you answered "Yes" for each question above, your company qualifies as a resident Bidder. Please complete Parts B and D of this form.
- If you answered "No" to one or more questions above, your company is a non-resident Bidder. Please complete Parts C and D of this form.

To be completed by all resident Bidders***Part B***

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

You may attach additional sheet(s) if needed.

To be completed by all non- resident Bidders***Part C***

Name of your home state or foreign country reported to the Iowa Secretary of State.

Does your company's home state or foreign country offer preferences to Bidders who are residents? ☐ Yes ☐ No

If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all Bidders***Part D***

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my Bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the complete form to the government body requesting Bids per 875 Iowa Administrative Code Chapter 156

This Form has been approved by the Labor Commissioner

309-6001 02-14

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- ☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.
- ☐ Yes ☐ No My business is a sole proprietorship, and I am an Iowa resident for Iowa income tax purposes.
- ☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- ☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- ☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- ☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

==== END OF SECTION 00460 ====

SECTION 00471**CONTRACTOR BACKGROUND INFORMATION****FOR SMALL CONTRACTS (Between \$25,000 and \$3,000,000)**

If at the discretion and upon request of the City, the apparent low bidder must submit the Contractor Background Information Form to the Jurisdiction/Government Entity Representative within 72 hours after the bid opening. Failure to submit the Contractor Background Information Form by the required deadline may be considered justification for the City to determine the Bidder as not responsible.

All questions must be answered clearly and comprehensively. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information that it deems necessary.

1. SUBMITTED BY:

Official Name of Firm: _____

Address: _____

2. CONTRACTOR'S CONTACT INFORMATION:

Contact Person: _____

Title: _____

Phone: _____

Email: _____

3. TYPE OF ORGANIZATION:

☐ SOLE PROPRIETORSHIP

Name of Owner: _____

Doing Business As: _____

Date of Organization: _____

☐ PARTNERSHIP

Date of Organization: _____

Type of Partnership: _____

Name of General Partner(s): _____

☐ CORPORATION

State of Organization: _____

Date of Organization: _____

Executive Officers:

President: _____

Vice President(s): _____

Treasurer: _____

Secretary: _____

☐ LIMITED LIABILITY COMPANY

State of Organization: _____

Date of Organization: _____

Members: _____

☐ JOINT VENTURE

State of Organization: _____

Date of Organization: _____

Form of Organization: _____

Joint Venture Managing Partner(s)

Name: _____

Address: _____

Name: _____

Address: _____

Name: _____

Address: _____

☐ OTHER

State of Organization: _____

Name of Organization: _____

Form of Organization: _____

Date of Organization: _____

Principal

Name: _____

Title: _____

Address: _____

A. How many years has your organization been in business as a contractor?

_____ years.

B. How many years have you been engaged in the contracting business under your present firm or trade name?

_____ years.

C. Under what other or former names does or has your organization operated?

4. CERTIFICATIONS:**CERTIFIED BY:**

Disadvantage Business Enterprise: _____

Minority Business Enterprise: _____

Woman Owned Enterprise: _____

Small Business Enterprise: _____

Other: _____

5. BONDING INFORMATION:

Bonding Company: _____

Address: _____

Bonding Agent: _____

Address: _____

Contact Name: _____

Phone: _____

Aggregate Bonding Capacity: _____

Available Bonding Capacity as of date of this submittal: _____

6. CONSTRUCTION EXPERIENCE:**A. Current Experience:**List on **Schedule A** all uncompleted projects currently under contract.**B. Previous Experience:**List on **Schedule B** at least three (3) projects completed within the last three (3) years that had a similar scope of work.

Do you have direct related project experience? If no direct related project experience, add an Attachment that explain how you intend to complete the contract.

☐ NO ☐ YES

In the past eight (8) years has the firm listed in Section 1 ever failed to complete a construction contract awarded to it? If YES, add an Attachment that provides details of the circumstances and include Project Owner's contact information.

☐ NO ☐ YES

Have you ever been found not to be a responsible Bidder under Iowa Code Chapter 26? If YES, add an Attachment that provides details of the circumstances and include Project Owner's contact information.

☐ NO ☐ YES

In the past eight (8) years has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity? If YES, add an Attachment that provides details of the circumstances and include Project Owner's contact information.

☐ NO ☐ YES

Are there any judgments, claims, disputes or litigation pending or outstanding with an individual value greater than \$200,000 involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)? If YES, add an Attachment that provides details of the circumstances and include Project Owner's contact information.

☐ NO ☐ YES

Have you ever been declared in default under a performance Bond in the last five (5) years? If YES, add an Attachment that provides details of the circumstances and include the name and contact person of the owner(s) of the project and the contact person at the surety/Bonding company.

☐ NO ☐ YES

Are you currently being investigated for or have previously violated in the last five years any of the following state or federal laws: Iowa Minimum Wage Act, Iowa Non-English Speaking Employees Act, Iowa Child Labor Act, Iowa Labor Commissioner's Right to Inspect Premises, Iowa Compensation Insurance Act, Employment Security Act, Iowa Competition Act, Iowa Income, Corporate and Sales Tax Code, Iowa Employee Registration Requirements, Iowa Hazardous Chemical Risks Act, Iowa Wage Payment Collection Act, Federal Income and Corporate Tax Code, The National Labor Relations Act, The Drug-Free Workplace Act, the Employee Retirement Insurance Security Act, Title VI of the Civil Rights Act of 1964, The Fair Labor Standards Act: If YES, add an Attachment that provides details of the circumstances and explain.

☐ NO ☐ YES

7. SAFETY PROGRAM:

Name of Contractor's Lead Safety Officer: _____

Name of Contractor's Safety
Officer assigned to the project: _____

Include the following as attachments:

- A. Provide as an Attachment Contractor's **OSHA No. 300- Log & Summary of Occupational Injuries & Illnesses** for the past 2 years. Contractor must submit the same information for all proposed Subcontractors performing Work having a value in excess of 10 percent of the total bid amount.
- B. Provide as an Attachment Contractor's list **of all OSHA Citations & Notifications of Penalty** (monetary or other) received within the last 2 years (indicate disposition as applicable) - IF NONE SO STATE. Contractor must submit the same information for all proposed Subcontractors performing Work having a value in excess of 10 percent of the total bid amount.
- C. Provide as an Attachment Contractor's **list of all safety citations or violations under any state** all received within the last 2 years (indicate disposition as applicable) - IF NONE SO STATE. Contractor must submit the same information for all proposed Subcontractors performing Work having a value in excess of 10 percent of the total bid amount.
- D. Provide the following for the firm listed in Section 3 (attach additional sheets as necessary) the following (Contractor must submit the same information for all proposed Subcontractors performing Work having a value in excess of 10 percent of the total bid amount:

Workers' compensation Experience Modification Rate (EMR) for the last 2 years:

YEAR _____	EMR _____
YEAR _____	EMR _____

Total Recordable Frequency Rate (TRFR) for the last 2 years:

YEAR _____	TRFR _____
YEAR _____	TRFR _____

Total number of man-hours worked for the last 2 Years:

YEAR _____	TOTAL NUMBER OF MAN-HOURS _____
YEAR _____	TOTAL NUMBER OF MAN-HOURS _____

8. EQUIPMENT:

Provide a statement that explains the contractual relationship between the Company listed in Section 3 and the owners of major pieces of equipment that will be utilized on this project.

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on this Project.

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HERewith, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF AND THAT THE CITY OF DUBUQUE MAY RELY ON THE INFORMATION PROVIDED.

NAME OF ORGANIZATION: _____

SIGNATURE: _____

NAME: _____

TITLE: _____

DATED: _____

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____, 20____

NOTARY PUBLIC - STATE OF _____

MY COMMISSION EXPIRES: _____

REQUIRED ATTACHMENTS:

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Evidence of authority for individuals listed in Section 3 to bind organization to a Contract.
4. Resumes of officers and key individuals (including Safety Officer) of Company named in Section 1.
5. Required safety program submittals listed in Section 7.
6. Schedule C (Major Equipment)
7. Additional items as needed to complete background information request.

SCHEDULE A**PROJECTS CURRENTLY UNDER CONTRACT**

Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:

SCHEDULE A**PROJECTS CURRENTLY UNDER CONTRACT**

Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:

SCHEDULE B**PREVIOUS EXPERIENCE (List projects that fulfill the requirements of Section 6B)**

Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:

SCHEDULE B**PREVIOUS EXPERIENCE (List projects that fulfill the requirements of Section 6B)**

Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:
Project Name:	
Project Information	
Project Type:	
Contract Start Date:	Contract End Date:
Percent Complete:	Contract Amount:

LIST OF MAJOR EQUIPMENT TO BE UTILIZED ON THIS PROJECT

[illegible]

===== END OF SECTION 00471 =====

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PUBLIC IMPROVEMENT CONTRACT
SECTION 00500

THIS IMPROVEMENT CONTRACT (the Contract), dated for references purposes the ____ day of _____, 2026 between the City of Dubuque, Iowa, by its City Manager, through authority conferred upon the City Manager by its City Council (City), and _____ (Contractor).

For and in consideration of the mutual covenants herein contained, the parties hereto agree as follows:

CONTRACTOR AGREES:

1. To furnish all material and equipment and to perform all labor necessary for the DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT (Project).
2. CONTRACT DOCUMENTS
 - A. The Contract Documents consist of the following:
 1. Project Title Page (Section 00100).
 2. Project Directory Page (Section 00101).
 3. This Public Improvement Contract (Section 00500).
 4. Performance, Payment, and Maintenance Bond (Section 00600).
 5. Out-of-State Contractor Bond (Section 00610).
 6. Other Bonds:
 - a. ____ (Bond Name) ____ (pages ____ to ____ , inclusive).
 - b. ____ (Bond Name) ____ (pages ____ to ____ , inclusive).
 - c. ____ (Bond Name) ____ (pages ____ to ____ , inclusive).
 7. Special Provisions included in the project Contract Document Manual.
 8. Drawings - Sheet No. ____ through No. ____ (00 pages) or drawings consisting of sheets bearing the following general title:

 9. Addenda (numbers ____ to ____ , inclusive).
 10. Insurance Provisions and Requirements (Section 00700).
 11. Sales Tax Exemption Certificate (Section 00750).
 12. Construction Schedule and Agreed Cost of Delay (Section 00800).
 13. Other Project Information and Permits (Sections 00000 - 00000).
 14. Exhibits to this Contract (enumerated as follows):
 - a. Contractor's Bid (pages ____ to ____ inclusive).

15. b. Bidder Status Form (Section 00460). c. The following documentation that must be submitted by Contractor prior to Notice of Award. I. Contractor Background Information Form (Section 00471)

ii. _____

iii. _____

16. The following which may be delivered or issued on or after the Effective Date of the Agreement:

- a. Notice to Proceed (Section 00850).
- b. Project Certification Page (Section 00102).
- c. Change Orders (Not attached to this agreement).

17. Authorization Resolution:

- a. Resolution No. 286-17 Authorizing City Manager to Execute Contracts and Leases (Exhibit C), or
- b. Project Specific Resolution (Resolution No. ____ - ____).

There are no other Contract Documents. The Contract Documents may only be amended, modified, or supplemented as provided in this Contract.

- 3. All materials used by the Contractor in the Project must be of the quality required by the Contract Documents and must be installed in accordance with the Contract Documents.
- 4. The Contractor must remove any materials rejected by the City as defective or improper, or any of said work condemned as unsuitable or defective, and the same must be replaced or redone to the satisfaction of the City at the sole cost and expense of the Contractor.
- 5. Three percent (3%) of the Contract price will be retained by the City for a period of thirty (30) days after final completion and acceptance of the Project by the City Council to pay any claim by any party that may be filed for labor and materials done and furnished in connection with the performance of this Contract and for a longer period if such claims are not adjusted within that thirty (30) day period, as provided in Iowa Code Chapter 573 or Iowa Code Chapter 26. The City will also retain additional sums to protect itself against any claim that has been filed against it for damages to persons or property arising through the prosecution of the work and such sums will be held by the City until such claims have been settled, adjudicated or otherwise disposed of.
- 6. The Contractor has read and understands the Contract Documents herein referred to and agrees not to plead misunderstanding or deception related to estimates of quantity, character, location or other conditions for the Project.
- 7. In addition to any warranty provided for in the specifications, the Contractor must also fix any other defect in any part of the Project, even if the Project has been accepted and fully paid for by the City. The Contractor's maintenance bond will be security for a period of two years after the issuance of the Certificate of Substantial Completion. The Contractor must fully complete the Project under this Contract on or before the date indicated in the Construction Schedule and Agreed Cost of Delay Section of the Contract Documents.
- 8. Indemnification; Liability for City Damage
 - a. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the City from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Contract,

provided that such claim, damages, loss or expense is attributable to bodily injury, sickness, disease or death, or injury to or destruction of property (other than the Project itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, the Contractor's subcontractor, or anyone directly or indirectly employed by the Contractor or the Contractor's subcontractor or anyone for whose acts the Contractor or the Contractor's subcontractor may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder.

- b. The Contractor shall also be liable to the City for any damage to City property arising out of or related to the Contractor's negligent performance of the Contract.
9. The Contractor hereby represents and guarantees that it has not, nor has any other person for or in its behalf, directly or indirectly, entered into any arrangement or Contract with any other Bidder, or with any public officer, whereby it has paid or is to pay any other Bidder or public officer any sum of money or anything of value whatever in order to obtain this Contract; and it has not, nor has another person for or in its behalf directly or indirectly, entered into any Contractor arrangement with any other person, firm, corporation or association which tends to or does lessen or destroy free competition in the award of this Contract and agrees that in case it hereafter be established that such representations or guarantees, or any of them are false, it will forfeit and pay not less than ten percent (10%) of the Contract price but in no event less than \$2,000.00 (Two Thousand Dollars) to the City as agreed upon damages.
10. The surety on the Bond furnished for this Contract must, in addition to all other provisions, be obligated to the extent provided for by Iowa Code 573.6 relating to this Contract.
11. The Contractor agrees, and its Bond is surety therefore, that after the Certificate of Substantial Completion has been issued by the City, it will keep and maintain the Project in good repair for a period of two (2) years.
12. The City may terminate this Contract with or without cause upon sixty (60) days' written notice delivered to the Contractor.
14. This Contract shall be governed by the laws of the State of Iowa and exclusive jurisdiction and venue for any action arising out of or related to this Contract shall be in the Iowa District Court for Dubuque County.
15. Counterparts and Electronic Signatures. This Contract may be executed in counterparts, each of which shall constitute an original, and all of which together shall constitute one and the same document. This Contract may be executed by the parties and transmitted by SECTION 00500 electronic transmission, and if so executed and transmitted, shall be effective as if the parties had delivered an executed original of this Contract.
16. Currency. All prices and financial terms referenced herein are intended to be in U.S. dollars and shall remain in U.S. dollars despite any exchange rate.
17. Conflict in Terms. In the event of a conflict between the terms of this Contract and the terms of any of the Contract Documents, the terms of this Contract shall prevail.

18. Legal Compliance.

a. The Contractor is responsible for compliance with all applicable laws, statutes, rules, regulations, and ordinances which may apply to the performance of Contractor's obligations under this Contract, including but not limited to the laws outlined in Exhibit D, and hereby represents and warrants that Contractor is in compliance with the same as of the Effective date and further represents that during the Term Contractor will remain in compliance. Contractor shall require all contractors and subcontractors providing services under this Contract shall also certify compliance with this Section.

b. When Applicable:

Contractor further represents and warrants that Contractor has obtained all necessary business permits and licenses that may be required to carry out the obligations pursuant to this Contract, including any permits and licenses that might be required by the state or locality in which Contractor performs the Services, and Contractor agrees to maintain, at Contractor's sole expense, such required permits and licenses for the duration of the term(s) of this Contract.

THE CITY AGREES:

The City agrees to pay the Contractor for the work performed under this Contract, up to the amount stated below, less any damages provided for in the Contract Documents.

CONTRACT AMOUNT \$ _____

CITY OF DUBUQUE, IOWA:

Department

By: _____
Signature

Printed Name

Title

Date

CONTRACTOR:

Contractor

By: _____
Signature

Printed Name

Title

Date

==== END OF SECTION 00500 ====

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PERFORMANCE, PAYMENT AND MAINTENANCE BOND**SECTION 00600**

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal (hereinafter the "Contractor" or "Principal") and _____, as Surety are held and firmly bound unto the City of Dubuque, Iowa, as Obligee (hereinafter referred to as "Owner"), and to all persons who may be injured by any breach of any of the conditions of this Bond in the penal sum of _____ dollars (\$ _____), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, legal representatives and assigns, jointly or severally, firmly by these presents.

The conditions of the above obligations are such that whereas said Contractor entered into a contract with the Owner, bearing date the _____ day of _____, 2026, (hereinafter the "Contract") wherein said Contractor undertakes and agrees to construct the following project in accordance with the Contract Documents, and to faithfully perform all the terms and requirements of said Contract within the time therein specified, in a good and workmanlike manner, and in accordance with the Contract Documents. The Contract Documents for DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT detail the following described improvements:

The scope of the Project is as follows: Remodel of existing second floor including removal plumbing fixtures, walls, doors, ceilings, and tile flooring in existing group shower/restrooms; removal of existing lockers and integral bases; removal of one fire pole and enclosing of associated floor opening; construction of new individual shower/restrooms in location of former restrooms and individual sleeping rooms in locations of former bunkrooms and locker room; upgrades to existing hot water system; installation of electrical, lighting, and fire alarm devices associated with aforementioned new construction.

It is expressly understood and agreed by the Contractor and Surety in this Bond that the following provisions are a part of this Bond and are binding upon said Contractor and Surety, to-wit:

1. **PERFORMANCE:** The Contractor shall well and faithfully observe, perform, fulfill, and abide by each and every covenant, condition, and part of said Contract and Contract Documents, by reference made a part hereof, for the project, and shall indemnify and save harmless the Owner from all outlay and expense incurred by the Owner by reason of the Contractor's default of failure to perform as required. The Contractor shall also be responsible for the default or failure to perform as required under the Contract and Contract Documents by all its subcontractors, suppliers, agents, or employees furnishing materials or providing labor in the performance of the Contract.
2. **PAYMENT:** The Contractor and the Surety on this Bond hereby agreed to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract on account of which this Bond is given, including but not limited to claims for all amounts due for labor, materials, lubricants, oil,

gasoline, repairs on machinery, equipment, and tools, consumed or used by the Contractor or any subcontractor, wherein the same are not satisfied out of the portion of the contract price the Owner is required to retain until completion of the improvement, but the Contractor and Surety shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the contract price shall have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Chapter 573 of the Iowa Code, which by this reference is made a part hereof as though fully set out herein.

3. MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:
 - A. To remedy any and all defects that may develop in or result from work to be performed under the Contract Documents within the period of **two (2) year(s)** from the date of acceptance of the work under the Contract, by reason of defects in workmanship, equipment installed, or materials used in construction of said work;
 - B. To keep all work in continuous good repair; and
 - C. To pay the Owner's reasonable costs of monitoring and inspection to assure that any defects are remedied, and to repay the Owner all outlay and expense incurred as a result of Contractor's and Surety's failure to remedy any defect as required by this section.

Contractor's and Surety's Contract herein made extends to defects in workmanship or materials not discovered or known to the Owner at the time such work was accepted.

4. GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:
 - A. To consent without notice to any extension of time authorized in approved change orders to the Contractor in which to perform the Contract.
 - B. To consent without notice to any change in the Contract or Contract Documents, authorized in approved change orders which thereby increases the total contract price and the penal sum of this Bond, provided that all such changes do not, in the aggregate, involve an increase of more than twenty percent (20%) of the total contract price, and that this Bond shall then be released as to such excess increase.
 - C. To consent without notice that this Bond shall remain in full force and effect until the Contract is completed, whether completed within the specified contract period, within an extension thereof, or within a period of time after the contract period has elapsed and the liquidated damage penalty is being charged against the Contractor.

The Contractor and every Surety on the Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

- D. That no provision of this Bond or of any other contract shall be valid that limits to less than five (5) years after the acceptance of the work under the Contract the right to sue on this Bond.
- E. That as used herein, the phrase "all outlay and expense" is not to be limited in any way but shall include the actual and reasonable costs and expenses incurred by the Owner including interest, benefits, and overhead where applicable. Accordingly, "all outlay and expense" would include but not be limited to all contract or employee expense, all equipment usage or rental, materials, testing, outside experts, attorney's fees (including overhead expenses of the Owner's staff attorneys), and all costs and expenses of litigation as they are incurred by the Owner. It is intended the Contractor and Surety will defend and indemnify the Owner on all claims made against the Owner on account of Contractor's failure to perform as required in the Contract and Contract Documents, that all agreements and promises set forth in the Contract and Contract Documents, in approved change orders, and in this Bond will be fulfilled, and that the Owner will be fully indemnified so that it will be put into the position it would have been in had the Contract been performed in the first instance as required.

In the event the Owner incurs any "outlay and expense" in defending itself against any claim as to which the Contractor or Surety should have provided the defense, or in the enforcement of the promises given by the Contractor in the Contract, Contract Documents, or approved change orders, or in the enforcement of the promises given by the Contractor and Surety in this Bond, the Contractor and Surety agree that they will make the Owner whole for all such outlay and expense, provided that the Surety's obligation under this Bond shall not exceed one hundred twenty-five percent (125%) of the penal sum of this Bond.

In the event that any actions or proceedings are initiated regarding this Bond, the parties agree that the venue thereof shall be Dubuque County, State of Iowa. If legal action is required by the Owner to enforce the provisions of this Bond or to collect the monetary obligation incurring to the benefit of the Owner, the Contractor and the Surety agree, jointly, and severally, to pay the Owner all outlay and expense incurred therefore by the Owner. All rights, powers, and remedies of the Owner hereunder shall be cumulative and not alternative and shall be in addition to all rights, powers, and remedies given to the Owner, by law. The Owner may proceed against surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether Contractor is joined in any such action(s) or not.

NOW THEREFORE, the condition of this obligation is such that if said Principal shall faithfully perform all the promises of the Principal, as set forth and provided in the Contract, in the Contract Documents, and in this Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

When a work, term, or phrase is used in this Bond, it shall be interpreted or construed first as defined in this Bond, the Contract, or the Contract Documents; second, if not defined in the Bond, Contract, or Contract Documents, it shall be interpreted or construed as defined in applicable provisions of the Iowa Code; third, if not defined in the Iowa Code, it shall be interpreted or construed according to its generally accepted meaning in the construction industry; and fourth, if it has no generally accepted

meaning in the construction industry, it shall be interpreted or construed according to its common or customary usage.

Failure to specify or particularize shall not exclude terms or provisions not mentioned and shall not limit liability hereunder. The Contract and Contract Documents are hereby made a part of this Bond.

Project: DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT

Location: 11 W. 9th Street, Dubuque, Iowa

Project Number: 1315000025

Witness our hands, in triplicate, this _____ day of _____, 2026.

SURETY COUNTERSIGNED BY:

Signature of Agent

Printed Name of Agent

Company Address

City, State, Zip Code

Company Telephone Number

PRINCIPAL:

Contractor

By: _____
Signature

Printed Name

Title

FORM APPROVED BY:

Representative for Owner

SURETY:

Surety Company

By: _____
Signature Attorney-in-Fact Officer

Printed Name of Attorney-in-Fact Officer

Company Name

Company Address

City, State, Zip Code

Company Telephone Number

NOTE:

1. All signatures on this performance, payment, and maintenance Bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted.
2. This Bond must be sealed with the Surety's raised, embossing seal.
3. The name and signature of the Surety's Attorney-in-Fact/Officer entered on this Bond must be exactly as listed on the Certificate or Power of Attorney accompanying this Bond.

===== END OF SECTION 00600 =====

OUT-OF-STATE CONTRACTOR BOND
SECTION 00610

An out-of-state Contractor must either file a surety Bond, as provided in Iowa Code section 91C.7, with the Iowa Division of Labor Services in the amount of twenty-five thousand dollars (\$25,000) for a one (1) year period or must provide a statement to the Iowa Division of Labor Services that the contractor is prequalified to Bid on projects for the Iowa Department of Transportation pursuant to Iowa Code Section 314.1

An out-of-state Contractor, before commencing a contract in excess of five thousand dollars (\$5,000) in value of Iowa, must file a Bond with the Iowa Division of Labor Services of the Iowa Department of Workforce Development. A Surety Bond filed pursuant to Iowa Code section 91C.2 must be executed by a surety company authorized to do business in this state, and the Bond must be continuous in nature until canceled by the Surety with not less than thirty (30) days; written notice to the contractor and to the Division of Labor Services of the Iowa Department of Workforce Development in dictating the surety's desire to cancel the Bond. The Surety company is liable under the Bond for any contract commenced after the cancellation of the Bond. The Bond must be in the sum of the greater of the following:

- (1) One thousand dollars (\$1,000.00); or
- (2) Five percent (5%) of the contract price

An out-of-state Contractor may file a blanket Bond in an amount at least equal to fifty thousand dollars (\$50,000) for a two (2) year period in lieu of filing an individual Bond for each Contract. The Division of Labor Services of the Iowa Department of Workforce Development may increase the Bond amount after a hearing.

More information about how to file an out-of-state contractor bond can be found at the Iowa Workforce Development website at <https://www.iowacontractor.gov/contractor-registration>

==== END OF SECTION 00610 ====

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INSURANCE PROVISIONS**SECTION 00700****City of Dubuque Insurance Requirements for General, Artisan or Trade
Contractors, Subcontractors or Sub Subcontractors****INSURANCE SCHEDULE F****Class A:**

Asbestos Removal	Fiber Optics	Roofing
Asphalt Paving	Fire Protection	Sanitary Sewers
Concrete	Fireproofing	Sheet Metal
Construction Managers	General Contractors	Site Utilities
Cranes	HVAC	Shoring
Culverts	Mechanical	Special construction
Decking	Paving & Surfacing	Steel
Demolition	Pavement Marking	Storm sewers
Deconstruction	Piles & Caissons	Structural Steel
Earthwork	Plumbing	Trails
Electrical	Retaining Walls	Tunneling
Elevators	Reinforcement	Water main

Class B:

Chemical Spraying	Landscaping	Rough Carpentry
Doors, Window & Glazing	Masonry	Stump Grinding
Drywall Systems	Vehicular Snow Removal	Tank Coating
Fertilizer Application	Painting & Wall Covering	Tree Removal
Geotech Boring	Pest Control	Tree Trimming
Insulation	Scaffolding	Tuckpointing
Finish Carpentry	Sidewalks	Waterproofing
	Plastering	Well Drilling

Class C:

Carpet Cleaning	General Cleaning	Power Washing
Carpet	Grass Cutting	Tile & Terrazzo Flooring
Resilient Flooring	Janitorial	Window Washing
Caulking & Sealants	Non Vehicular Snow Removal	
Acoustical Ceiling	Non Vehicular Ice Removal	
Filter Cleaning	Office Furnishings	

**City of Dubuque Insurance Requirements for General, Artisan or Trade
Contractors, Subcontractors or Sub Subcontractors**

INSURANCE SCHEDULE F (continued)

1. Contractor shall furnish a signed certificate of insurance to the department responsible for the contract for the coverage required in Exhibit I prior to commencing work and at the end of the project if the term of work is longer than 60 days. Contractors presenting annual certificates shall present a certificate at the end of each project with the final billing. Each certificate shall be prepared on the most current ACORD form approved by the Iowa Department of Insurance or an equivalent approved by the Director of Finance and Budget or Designee. The certificate must clearly indicate the project number, project name, or project description for which it is being provided Eg:
Project Number: 1315000025
Project Name: DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT
Project Location: 11 W. 9th Street, Dubuque, Iowa
2. All policies of insurance required hereunder shall be with an insurer authorized to do business in Iowa and all insurers shall have a rating of A or better in the current A.M. Best's Rating Guide.
3. Each Certificate required shall be furnished to the Engineering Department of the City of Dubuque.
4. Failure to provide the coverages described in this Insurance Schedule shall not be deemed a waiver of these requirements by the City of Dubuque. Failure to obtain or maintain the required insurance shall be considered a material breach of this contract.
5. Contractor shall require all subcontractors and sub-subcontractors to obtain and maintain during the performance of work insurance for the coverages described in this Insurance Schedule and shall obtain certificates of insurance from all such subcontractors and sub-subcontractors. Contractor agrees that it shall be liable for the failure of a subcontractor and sub-subcontractor to obtain and maintain such coverage. The City may request a copy of such certificates from the Contractor.
6. All required endorsements shall be attached to the certificate. The certificate is due before the contract/agreement can be approved.
7. Whenever an ISO form is referenced, the current edition must be provided.
8. Contractor shall be required to carry the minimum coverage/limit, or greater if required by law or other legal agreement, in Exhibit I - Insurance Schedule F. If the contractor's limits of liability are higher than the required minimum limit, then the contractor's limits shall be this agreement's required limits.
9. Contractor shall be responsible for deductibles and self-insured retention for payment of all policy premiums and other cost associated with the insurance policies required below.
10. All certificates of insurance must include agents name, phone number, and email address.
11. The City of Dubuque reserves the right to require complete, certified copies of all required insurance policies, including endorsements, required by this Schedule at any time.
12. The City of Dubuque reserves the right to modify these requirements, including limits, based on changes in the risk or other special circumstances during the term of the contract, subject to written mutual agreement attached hereto.

**City of Dubuque Insurance Requirements for General, Artisan or Trade
Contractors, Subcontractors or Sub Subcontractors**

INSURANCE SCHEDULE F (continued)

EXHIBIT I

A) COMMERCIAL GENERAL LIABILITY

General Aggregate Limit	\$2,000,000
Products-Completed Operations Aggregate Limit	\$2,000,000
Personal and Advertising Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000
Fire Damage Limit (any one occurrence)	\$ 50,000
Medical Payments	\$ 5,000

- 1) Coverage shall be written on an occurrence, not claims made, form. The general liability coverage shall be written in accord with ISO form CG 00 01 or business owners form BP 00 02. All deviations from the standard ISO commercial general liability form CG 00 01 or business owners form BP 00 02 shall be clearly identified.
- 2) Include ISO endorsement form CG 25 04 "Designated Location(s) General Aggregate Limit" or CG 25 03 "Designated Construction Project(s) General Aggregate Limit" as appropriate.
- 3) Include endorsement indicating that coverage is primary and non-contributory.
- 4) Include Preservation of Governmental Immunities Endorsement. (Sample attached).
- 5) Include additional insured endorsement for:
The City of Dubuque, including all its elected and appointed officials, all its employees and volunteers, all its boards, commissions and/or authorities and their board members, employees and volunteers. Use ISO form CG 20 10 (Ongoing operations).
- 6) The additional insured endorsement shall include completed operations under ISO form CG 2037 during the project term and for a period of two years after the completion of the project.
- 7) Policy shall include Waiver of Right to Recover from Others endorsement.
- 8) Policy shall include cancellation and material change endorsement providing thirty (30) days advance written notice of cancellation, non-renewal, reduction in insurance coverage and/or limits and ten (10) days written notice of non-payment of premium shall be sent to: City of Dubuque Finance Department, 50 West 13th Street Dubuque, Iowa 52001.
- 9) Contractor and subcontractor shall not use any drone without the prior written approval of the City of Dubuque. Any drone usage must comply with above liability limits and the additional insured endorsement must name the City of Dubuque with respect to aircraft liability coverage.

B) WORKERS' COMPENSATION & EMPLOYERS LIABILITY

Statutory Benefits covering all employees injured on the job by accident or disease as prescribed by Iowa Code Chapter 85.

Coverage A	Statutory - State of Iowa	
Coverage B	Employers Liability	
	Each Accident	\$100,000
	Each Employee-Disease	\$100,000
	Policy Limit-Disease	\$500,000

Policy shall include Waiver of Right to Recover from Others endorsement.

**City of Dubuque Insurance Requirements for General, Artisan or Trade
Contractors, Subcontractors or Sub Subcontractors**

INSURANCE SCHEDULE F (continued)

Coverage B limits shall be greater if required by the umbrella/excess insurer. OR

If, by Iowa Code Section 85.1A, the Contractor is not required to purchase Workers' Compensation Insurance, the Contractor shall have a copy of the State's Nonelection of Workers' Compensation or Employers' Liability Coverage form on file with the Iowa.

Workers' Compensation Insurance Commissioner, as required by Iowa Code Section 87.22. Completed form must be attached.

C) AUTOMOBILE LIABILITY

Combined Single Limit \$1,000,000

Coverage shall include all owned, non-owned, and hired vehicles. If the Contractor's business does not own any vehicles, coverage is required on non-owned and hired vehicles.

1) Policy shall include Waiver of Right to Recover from Others endorsement.

D) UMBRELLA/EXCESS LIABILITY

The General Liability, Automobile Liability and Workers Compensation Insurance requirements may be satisfied with a combination of primary and Umbrella or Excess Liability Insurance. If the Umbrella or Excess Insurance policy does not follow the form of the primary policies, it shall include the same endorsements as required of the primary policies including Waiver of Subrogation and Primary and Non-contributory in favor of the City.

All Class A contractors with contract values in excess of \$10,000,000 must have umbrella/excess liability coverage of \$10,000,000.

All Class A and Class B contractors with contract values between \$500,000 and \$10,000,000 must have umbrella/excess liability coverage of \$3,000,000.

All Class A and B contractors with contract values less than \$500,000 must have umbrella/excess liability coverage of \$1,000,000.

All Class C contractors are not required to have umbrella/excess liability coverage.

All contractors performing earth work must have a minimum of \$3,000,000 umbrella regardless of the contract value.

E) POLLUTION LIABILITY

Coverage required: ☐ Yes ☒ No

Pollution liability coverage shall be required if project involves any pollution exposure for hazardous or contaminated materials including, but not limited to, the removal of lead, asbestos, or PCB's. Pollution product and complete operations coverage shall also be covered.

Each Occurrence	\$2,000,000
Policy Aggregate	\$4,000,000

**City of Dubuque Insurance Requirements for General, Artisan or Trade
Contractors, Subcontractors or Sub Subcontractors**

INSURANCE SCHEDULE F (continued)

- 1) Policy to include job site and transportation coverage.
- 2) Include additional insured for:
The City of Dubuque, including all its elected and appointed officials, all its employees and volunteers, all its boards, commissions and/or authorities and their board members, employees and volunteers. Use ISO form CG 20 10. (Ongoing operations) or its equivalent and CG 20 37 (completed operations) or its equivalent.
- 3) Include Preservation of Governmental Immunities Endorsement.
- 4) Provide evidence of coverage for 5 years after completion of project.
- 5) Include endorsement indicating that coverage is primary and noncontributory.
- 6) Policy shall include waiver of right to recovery from others endorsement.
- 7) Pollution liability shall include ISP endorsement CA 99 48. Pollution Liability-Broadened Coverage for Covered Autos, or equivalent endorsement if the contractor has vehicles that transport fuel onto the Owner's property.

F) RAILROAD PROTECTIVE LIABILITY

Coverage required: ___ Yes X No

Any contract for construction or demolition work on or within fifty feet (50') from the edge of the tracks of a railroad and affecting any railroad bridge, trestle, tracks, roadbeds, tunnel, underpass, or crossing, for which an easement, license or indemnification of the railroad is required, shall require evidence of the following additional coverages.

Railroad Protective Liability:

\$ _____ each occurrence (per limits required by Railroad)

\$ _____ policy aggregate (per limits required by Railroad)

AND

An endorsement to the Commercial General Liability policy equal to ISO CG 24 17 (Contractual Liability-Railroads). A copy of this endorsement shall be attached to the certificate of insurance.

**City of Dubuque Insurance Requirements for General, Artisan or Trade Contractors,
Subcontractors or Sub Subcontractors**

INSURANCE SCHEDULE F (continued)

Iowa Code Chapter 670, Liability of Governmental Subdivisions, provides cities with certain immunities which may be available to you. Naming the City of Dubuque as an additional insured on your insurance as is requested by this Insurance Schedule may result in your waiver of those immunities. If you would like to preserve those immunities, please use this endorsement or an equivalent form. The preservation of immunities is for your benefit.

PRESERVATION OF GOVERNMENTAL IMMUNITIES ENDORSEMENT

1. Nonwaiver of Governmental Immunity. The insurer expressly agrees and states that the purchase of this policy and the including of the City of Dubuque, Iowa as an Additional Insured does not waive any of the defenses of governmental immunity available to the City of Dubuque, Iowa under Code of Iowa Section 670.4 as it now exists and as it may be amended from time to time.
2. Claims Coverage. The insurer further agrees that this policy of insurance shall cover only those claims not subject to the defense of governmental immunity under the Code of Iowa Section 670.4 as it now exists and as it may be amended from time to time. Those claims not subject to Code of Iowa Section 670.4 shall be covered by the terms and conditions of this insurance policy.
3. Assertion of Government Immunity. The City of Dubuque, Iowa shall be responsible for asserting any defense of governmental immunity, and may do so at any time and shall do so upon the timely written request of the insurer.
4. Non-Denial of Coverage. The insurer shall not deny coverage under this policy and the insurer shall not deny any of the rights and benefits accruing to the City of Dubuque, Iowa under this policy for reasons of governmental immunity unless and until a court of competent jurisdiction has ruled in favor of the defense(s) of governmental immunity asserted by the City of Dubuque, Iowa.

No Other Change in Policy. The above preservation of governmental immunities shall not otherwise change or alter the coverage available under the policy.

SPECIMEN

==== END OF SECTION 00700 ====

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SALES AND USE TAX EXEMPTION CERTIFICATE**SECTION 00750**

The City of Dubuque, as a designated exempt entity awarding construction contracts, will issue special exemption certificates to contractors and subcontractors, allowing them to purchase, or withdraw from inventory, materials for the Contract free from sales tax pursuant to Iowa Code Sections: 422.42 (15) & (16), and 422.47 (5). The special exemption certificate will also allow a manufacturer of building materials to consume materials in the performance of a construction contract without owing tax on the fabricated cost of those materials.

1. These tax exemption certificates and authorization letters are applicable only for the work under the contract. The Contractor and each subcontractor shall comply with said Iowa Code Sales Tax requirements, shall keep records identifying the materials and supplies purchased and verify that they were used on the contract, and shall pay tax on any materials purchased tax-free and not used on the contract.
2. Upon award of Contract the City will register the Contract, Contractor, and each subcontractor with the Iowa Department of Revenue and Finance; and distribute tax exemption certificates and authorization letters to the Contractor and each subcontractor.

**PROJECT INFORMATION REQUIREMENTS FOR
STATE OF IOWA SALES TAX EXEMPTION CERTIFICATES
FOR CONTRACTORS & SUBCONTRACTORS**

Submitting Department: Engineering

Department Contact: Jim Bousley

Project CIP Number(s): 1315000025

Please complete this form in its entirety and submit along with the executed Contract, Bonds and Certificate of Insurance. Upon receipt, the City Finance Department will work with the Iowa Department of Revenue to issue Sales Tax Exemption Certificates to the approved contractor(s) to allow for the purchase or inventory withdrawal of materials for the specified Project free from State of Iowa Sales Tax.

Sales tax exemption certificates are not provided to material suppliers.

The Contractor and subcontractors can provide copies of the sales tax exemption certificates issued by the City to individual material suppliers.

Project Name:	DUBUQUE FIRE HEADQUARTERS BUNKROOM REMODEL PROJECT
Project Description:	The scope of the Project is as follows: Remodel of existing second floor including removal plumbing fixtures, walls, doors, ceilings, and tile flooring in existing group shower/restrooms; removal of existing lockers and integral bases; removal of one fire pole and enclosing of associated floor opening; construction of new individual shower/restrooms in location of former restrooms and individual sleeping rooms in locations of former bunkrooms and locker room; upgrades to existing hot water system; installation of electrical, lighting, and fire alarm devices associated with aforementioned new construction.
Start Date (Bid Opening Date):	July 9, 2026
Final Completion Date:	November 20, 2026

1. General Prime Contractor:	
Contact Name:	
Complete Address: (Include PO Box and Street Information)	
City, State, Zip Code	
Telephone Number:	
Federal I.D. Number: (or Include Social Security Number)	
Work Type to be Completed:	

2.	Subcontractor:	
	Complete Address: (Include PO Box and Street Information)	
	City, State, Zip Code	
	Telephone Number:	
	Federal I.D. Number: (or Include Social Security Number)	
	Work Type to be Completed:	

3.	Subcontractor:	
	Complete Address: (Include PO Box and Street Information)	
	City, State, Zip Code	
	Telephone Number:	
	Federal I.D. Number: (or Include Social Security Number)	
	Work Type to be Completed:	

4.	Subcontractor:	
	Complete Address: (Include PO Box and Street Information)	
	City, State, Zip Code	
	Telephone Number:	
	Federal I.D. Number: (or Include Social Security Number)	
	Work Type to be Completed:	

5.	Subcontractor:	
	Complete Address: (Include PO Box and Street Information)	
	City, State, Zip Code	
	Telephone Number:	
	Federal I.D. Number: (or Include Social Security Number)	
	Work Type to be Completed:	

==== END OF SECTION 00750 ====

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CONSTRUCTION SCHEDULE AND AGREED COSTS OF DELAY

SECTION 00800

800.1 SCHEDULE:**CALENDAR DAY SCHEDULE:**

Work required by the Contract Documents shall commence within ten (10) calendar days after Notice to Proceed has been issued and shall be fully completed by November 20,2026.

MILESTONE DATES:

In addition to the required Final Completion Dates, there are milestones by which certain items of work must be completed. See General Requirements for milestone requirements.

Milestone 1 - Final Completion

11-20-2026

In general, the following contract completion Milestone shall be followed.

a. Milestone 1 Completion: _____.

800.2 AGREED COSTS OF DELAY:

Time is of the essence of the Contract. As delay in the diligent prosecution of the work may inconvenience the public, obstruct traffic, interfere with business, and/or increase costs to the City such as engineering, administration, and inspection, it is important that the work be prosecuted vigorously to final completion.

An extension of the contract period may be granted by the City for any of the following reasons:

1. Additional work resulting from a modification of the Contract Documents by approved change order.
2. Delays caused by the City.
3. Other reasons beyond the control of the Contractor, which in the City's opinion, would justify such.

Should the Contractor, or in case of default the Surety, fail to complete the work within the specified Milestone(s), Substantial and Final Completion Dates, a deduction at the daily rate for agreed costs of delay will be made for each and every calendar day or working day, whichever is specified, such that the work remains uncompleted. The Contractor or

the Contractor's Surety shall be responsible for all costs incidental to the completion of the work, and shall be required to pay the City the following daily costs:

- A. For each calendar day that any work remains uncompleted beyond the Substantial Completion date the contractor will be assessed and shall pay, \$500.00 per calendar day, not as a penalty but as predetermined and Agreed Cost of Delay until Substantial Completion requirements are met.
- B. For each calendar day that any work remains uncompleted beyond the Final Completion date the contractor will be assessed and shall pay, \$500.00 per calendar, not as a penalty but as predetermined and Agreed Cost of Delay until Final Completion requirements are met.

Permitting the Contractor to continue and finish the Work, or any part of it, after the expiration of the Substantial and Final Completion dates or Milestone Dates or extension thereof shall in no way operate as a waiver on the part of the City of any of its rights or remedies under the contract, including its right to Agreed Cost of Delay pursuant to this provision. Furthermore, the assessment of Agreed Cost of Delay shall not constitute a waiver of the City's right to collect any additional damages which the City may sustain by failure of the Contractor to carry out the terms of the Contract.

The Agreed Cost of Delay rates specified in the Contract Documents is hereby agreed upon as the true and actual damages due the City for loss to the City and to the public due to obstruction of traffic, interference with business, and/or increased costs to the City such as engineering, administration, construction, and inspection after the expiration of the contract times, or extension thereof. Such Agreed Cost of Delay will be separately invoiced to the Contractor, and final payment will be withheld from the Contractor until payment has been made of this invoice for the agreed cost of delay. The Contractor and its surety shall be liable for any agreed cost of delay in excess of the amount due the Contractor.

==== END OF SECTION 00800 ====



City of Dubuque
Engineering Department
50. W. 13th Street
Dubuque, IA 52001
(563) 589-427000850

NOTICE TO PROCEED

SECTION 00850

TO: CONTRACTOR NAME
ADDRESS
CITY, STATE ZIP

ISSUE DATE: _____

COMMENCEMENT DATE: _____

(INSERT DATE = 10 DAYS FROM ISSUING NOTICE TO PROCEED)

PROJECT:

Dear _____:

You are hereby notified to commence the work on the Project, on or before the commencement date, in accordance with the Contract Documents. The Contract Time shall begin to run on the commencement date **-OR-** Working days will be charged beginning with the commencement date or on the day work begins, whichever is earlier.

You are required to return an acknowledged copy of this Notice to Proceed to the City.

THE CITY HAS RECEIVED A COPY
OF THE CONTRACTOR'S WRITTEN
SAFETY PROGRAM

☐

YES

CITY OF DUBUQUE, IOWA

By: _____
(Signature)

Robert D. Schiesl, PE

Assistant City Engineer

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged this ____ day of _____, 2026.

PRINCIPAL:

(Contractor)
By: _____
(Signature)

(Name)

(Title)

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SPECIAL PROVISIONS
PROJECT MANUAL - ARCHITECTURAL
SECTION 01100

DIVISION 2 – EXISTING CONDITIONS

02 4119 SELECTIVE DEMOLITION

DIVISION 3 – CONCRETE

03 3000 CAST-IN-PLACE CONCRETE

DIVISION 4 – MASONRY

04 2000 UNIT MASONRY

DIVISION 5 – METALS

05 5000 METAL FABRICATIONS

DIVISION 6 – WOOD, PLASTICS AND COMPOSITES

06 1000 ROUGH CARPENTRY

06 4100 ARCHITECTURAL WOOD CASEWORK

DIVISION 8 – OPENINGS

08 1213 HOLLOW METAL FRAMES

08 1416 FLUSH WOOD DOORS

08 7100 DOOR HARDWARE

DIVISION 9 – FINISHES

09 2116 GYPSUM BOARD ASSEMBLIES

09 2216 NON-STRUCTURAL METAL FRAMING

09 3000 TILING

09 6510 LUXURY VINYL TILE FLOORING

09 6513 RESILIENT BASE AND ACCESSORIES

09 9123 INTERIOR PAINTING

09 9300 STAINING AND TRANSPARENT FINISHING

DIVISION 10 – SPECIALTIES

10 1400 SIGNAGE

10 2800 TOILET ACCESSORIES

DIVISION 12 – FURNISHINGS

12 3661 SOLID SURFACE COUNTERTOPS

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Selective demolition of building elements for alteration purposes.

1.02 DEFINITIONS

- A. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.
- C. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.
- D. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

PART 3 EXECUTION

2.01 DEMOLITION

- A. Remove portions of existing building as indicated in the drawings.
- B. Remove items indicated, for salvage, relocation, and recycling.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 3. Provide, erect, and maintain temporary barriers and security devices.
 - 4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 6. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
 - 7. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Protect existing structures and other elements to remain in place and not removed.
 - 1. Stop work immediately if adjacent structures appear to be in danger.
- D. Minimize production of dust due to demolition operations. Do not use water if that will result in damage to other areas of the existing building outside of the construction area.
- E. Hazardous Materials:
 - 1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

2.03 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 - 1. Verify construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Remove existing work as indicated and required to accomplish new work.
 - 1. Remove items indicated on drawings.
- C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- D. Protect existing work to remain.
 - 1. Prevent movement of structure. Provide shoring and bracing as required.
 - 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch to match new work.

2.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

**SECTION 03 30 00
CAST-IN-PLACE CONCRETE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete for composite floor construction.
- B. Joint devices associated with concrete work.
- C. Concrete curing.

1.02 REFERENCE STANDARDS

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- C. ACI 301 - Specifications for Concrete Construction; 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- F. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- G. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- H. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- I. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2022.
- J. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- K. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
- L. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 2. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 3. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
 - 4. Indicate amounts of mixing water to be withheld for later addition at Project site.

PART 2 PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fly Ash: ASTM C618, Class C or F.

- C. Ground granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- D. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- E. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: Refer to concrete mixtures.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- F. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.02 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
- C. Air Entrainment Admixture: ASTM C260/C260M.
- D. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.
- J. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.03 ACCESSORY MATERIALS

- A. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.04 BONDING AND JOINTING PRODUCTS

- A. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.

2.05 CURING MATERIALS

- A. Curing and Sealing Compound, High Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
 - 1. VOC Content: Ozone Transport Commission (OTC) compliant.
 - 2. Products:
 - a. Conspec by Dayton Superior; Sealcure 1315 WB.
 - b. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
 - c. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
 - d. W. R. Meadows, Inc; VOCOMP-30: www.wrmeadows.com/#sle.
- B. Water: Potable, not detrimental to concrete.

2.06 CONCRETE MIX DESIGN

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 25 percent.
 - a. Slab-on-grade receiving Permeability-reducing cure coat to have fly ash limited to 20 percent.
 2. Ground Granulated Blast-Furnace Slag: 20 percent.
 3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag: 30 percent portland cement minimum, with fly ash not exceeding 25 percent.
 4. Silica Fume: 10 percent.
 5. Combined Fly Ash and Silica Fume: 35 percent with fly ash not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
 1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.07 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Concrete Toppings at Composite Deck: Proportion normal-weight concrete mixture as follows:
 1. Minimum Compressive Strength: 5000 psi at 28 days.
 2. Minimum Cementitious Materials Content: 520 lb/cu. yd.
 3. Maximum Water-Cementitious Materials Ratio: 0.45.
 4. Air Content: Do not allow air content of trowel-finished toppings to exceed 3 percent.
 5. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 5 lb/cu. yd.

2.08 MIXING

- A. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.
- B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- C. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.

3.04 CONCRETE FINISHING

- A. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

3.05 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.06 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

**SECTION 04 20 00
UNIT MASONRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete block.
- B. Mortar and grout.

1.02 REFERENCE STANDARDS

- A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- B. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.
- C. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- D. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units and mortar.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
 - 2. Nonloadbearing Units: ASTM C129.
 - a. Hollow block.
 - b. Lightweight.

2.02 MORTAR MATERIALS

- A. Masonry Cement: ASTM C91/C91M, Type N.
- B. Mortar Aggregate: ASTM C144.
- C. Water: Clean and potable.

2.03 MORTAR MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
 - 1. Interior, non-loadbearing masonry: Type O.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PLACING AND BONDING

- A. Lay hollow masonry units with face shell bedding on head and bed joints.

- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar and mortar smears as work progresses.
- D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

3.03 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
 - 1. Do not vary from joint thickness of adjacent course by more than 1/8 inch.
- F. Maximum Variation of Mortar Joint Thickness: Bed joint, minus [1/8] inch, plus [1/8] inch.
 - 1. Do not vary from joint thickness of adjacent course by more than 1/8 inch.
 - 2. Maximum thickness limited to 1/2 inch.
- G. Maximum Variation in vertical alignment of head joints: 1/4 inch in 10 feet, or 1/2 inch maximum over full height of wall.
- H. Maximum Variation of vertical lines such as external corners, door jambs, reveals, expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 3/8 inch in 20 feet.
- I. Maximum Variation of face alignment exposed masonry units: 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

3.04 CUTTING AND FITTING

- A. Cut and fit for pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.

3.05 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

END OF SECTION

**SECTION 05 50 00
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 05 31 00 - Steel Decking: Bearing angles for metal deck bearing, including anchorage.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- C. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FINISHES - STEEL

- A. Prime Painting: One coat.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

END OF SECTION

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**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- B. PS 1 - Structural Plywood; 2023.
- C. PS 20 - American Softwood Lumber Standard; 2021.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Moisture Content: S-dry or MC19.
- B. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.03 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.02 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide blocking as required to support finishes, fixtures, specialty items, and trim.
- B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

- C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- D. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Grab bars.
 - 3. Towel and bath accessories.
 - 4. Wall-mounted door stops.
 - 5. Wall paneling and trim.

END OF SECTION

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Hardware.

1.02 RELATED REQUIREMENTS

- A. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. BHMA A156.9 - Cabinet Hardware; 2020.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

- A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
- B. Product Data: Provide data for hardware accessories.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
 - 2. Single Source Responsibility: Provide and install this work from single fabricator.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Plastic Laminate Faced Cabinets: Custom grade.
- C. Cabinets:
 - 1. Finish - Exposed Exterior Surfaces: Decorative laminate.
 - 2. Finish - Exposed Interior Surfaces: Decorative laminate.
 - 3. Finish - Semi-Exposed Surfaces: Decorative laminate
 - 4. Finish - Concealed Surfaces: Manufacturer's option.
 - 5. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
 - 6. Door and Drawer Front Retention Profiles: Fixed panel.
 - 7. Casework Construction Type: Type A - Frameless.
 - 8. Grained Face Layout for Cabinet and Door Fronts: Flush panel.
 - a. Custom Grade: Doors, drawer fronts and false fronts wood grain to run and match vertically within each cabinet unit.

9. Adjustable Shelf Loading: 50 psf.
10. Cabinet Style: Flush overlay.
11. Cabinet Doors and Drawer Fronts: Flush style.
12. Drawer Side Construction: Multiple-dovetailed.
13. Drawer Construction Technique: Dovetail joints.

2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

2.03 LAMINATE MATERIALS

- A. Manufacturers:
 1. As indicated on drawings..
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

2.04 COUNTERTOPS

- A. Countertops: See Section 12 36 00.

2.05 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
 1. Color: As selected by Architect from manufacturer's standard range.
- C. Fasteners: Size and type to suit application.
- D. Concealed Joint Fasteners: Threaded steel.

2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
- C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers.
- D. Soft-Close, Door and Drawer Adjustable Dampers:
- E. Hinges: European style concealed self-closing type, steel with nickel-plated finish.

2.07 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.

3.03 ADJUSTING

- A. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

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SECTION 07 92 00 JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.

1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- B. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- D. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.
- E. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Installation Plan: Submit at least four weeks prior to start of installation.
- F. Installation Log: Submit filled-out log for each length or instance of sealant installed.
 - 1. Joint-Sealant Schedule: Include the following information:
 - a. Joint-sealant application, joint location, and designation.
 - b. Joint-sealant manufacturer and product name.
 - c. Joint-sealant color.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

1.06 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 20 years from date of Final Acceptance for weatherseal and non-staining of silicone sealants.
- B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nonsag Sealants:
 - 1. Bostik Inc: www.bostik-us.com/#sle.
 - 2. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - 3. Hilti, Inc: www.us.hilti.com/#sle.
 - 4. Pecora Corporation: www.pecora.com/#sle.
 - 5. Sika Corporation: www.usa-sika.com/#sle.
 - 6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 - 7. W.R. Meadows, Inc: www.wrmeadows.com/#sle.
 - 8. Or approved equal.
- B. Self-Leveling Sealants:
 - 1. Bostik Inc: www.bostik-us.com/#sle.
 - 2. Pecora Corporation: www.pecora.com/#sle.
 - 3. Sika Corporation: www.usa-sika.com/#sle.
 - 4. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 - 5. W.R. Meadows, Inc: www.wrmeadows.com/#sle.
 - 6. Or approved equal.

2.02 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Do Not Seal:
 - a. Intentional weep holes in masonry.
 - b. Joints indicated to be covered with expansion joint cover assemblies.
 - c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
 - d. Joints where sealant installation is specified in other sections.
 - e. Joints between suspended ceilings and walls.
- B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
 - 1. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.
- C. Interior Wet Areas: restrooms, kitchens, and food service areas; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.

2.03 JOINT SEALANTS - GENERAL

2.04 NONSAG JOINT SEALANTS

- A. Type JS-2 - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
 - 1. Color: Clear.
 - 2. Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors and counters.
- B. Type ____ - Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
 - 1. Movement Capability: Plus and minus 35 percent, minimum.
- C. Type ____ - Nonsag Traffic-Grade Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Hardness Range: 20 to 30, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's standard range.
 - 4. Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
- D. Type JS-5 - Non-Curing Butyl Sealant: Solvent-based, single component, non-sag, non-skinning, non-hardening, non-bleeding; non-vapor-permeable; intended for fully concealed applications.
 - 1. Locations:
 - a. Under sill tracks in all exterior metal framed walls.
 - b. Termination strips at roofing membrane, unless roofing manufacturer recommends alternative type of sealant.
 - c. Under sill flashings at windows, lintels, and similar flashings.

2.05 SELF-LEVELING JOINT SEALANTS

2.06 ACCESSORIES

- A. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- B. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- C. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- D. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
 - 4. Roll backer rods into joints with adjustable backer rod insertion roller tool. Do not use sharp tools such as screwdrivers, putty knives, etc.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below 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 sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 12 13 HOLLOW METAL FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal frames for non-hollow metal doors.

1.02 RELATED REQUIREMENTS

- A. Section 08 14 16 - Flush Wood Doors: Non-hollow metal door for hollow metal frames.
- B. Section 08 71 00 - Door Hardware: Hardware, silencers, and weatherstripping.
- C. Section 09 91 23 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2018.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2020.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.
- I. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2016.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- M. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
- N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2019.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Frames:
 - 1. Ceco Door, an Assa Abloy Group company; ____: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company; ____: www.assaabloydss.com/#sle.
 - 3. Republic Doors, an Allegion brand; ____: www.republicdoor.com/#sle.
 - 4. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

- A. Refer to Door and Frame Schedule on the drawings for frame sizes, fire ratings, sound ratings, finishing, door hardware to be installed, and other variations, if any.

2.03 HOLLOW METAL DOOR FRAMES

- A. Frame Finish: Factory primed and field finished.
- B. Interior Door Frames, Non-Fire Rated: _____ fully-welded.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 1 - Standard-duty.
 - b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.

2.04 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.05 ACCESSORIES

- A. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

- A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Install door hardware as specified in Section 08 71 00.
 - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- D. Coordinate installation of electrical connections to electrical hardware items.
- E. Touch up damaged factory finishes.

3.03 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.04 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

**SECTION 08 14 16
FLUSH WOOD DOORS**

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 08 12 13 - Hollow Metal Frames.
- B. Section 08 71 00 - Door Hardware.
- C. Section 09 91 23 - Interior Painting: Field finishing of hollow metal frames.
- D. Section 09 93 00 - Staining and Transparent Finishing: Field finishing of doors.

1.02 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

1.03 SUBMITTALS

- A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- C. Samples: Submit two samples of door veneer, 6 by 6 inches in size illustrating wood grain, stain color, and sheen.
- D. Manufacturer's qualification statement.
- E. Warranty, executed in Owner's name.

1.04 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than five years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

PART 2 PRODUCTS

2.01 DOORS

- A. Doors: See drawings for locations and additional requirements.
 - 1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at each location.

2.02 DOOR AND PANEL CORES

- A. Non-Rated Solid Core: Type particleboard core (PC), plies and faces as indicated.

2.03 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: White birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.

2.04 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- C. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- D. Provide edge clearances in accordance with the quality standard specified.
- E. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
- F. Top of doors are to be sealed to protect from moisture.
- G. Bottom of doors are to be sealed to protect from moisture.

2.05 FINISHES - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 1, Lacquer, Nitrocellulose.
 - b. Stain: As selected by Architect.
 - c. Sheen: Flat.

2.06 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 08 12 13.
- B. Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Use machine tools to cut or drill for hardware.
- C. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION

**SECTION 08 71 00
DOOR HARDWARE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood doors.

1.02 RELATED REQUIREMENTS

- A. Section 08 12 13 - Hollow Metal Frames.
- B. Section 08 14 16 - Flush Wood Doors.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA A156.2 - Bored and Preassembled Locks and Latches; 2017.
- C. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.
- D. BHMA A156.16 - Auxiliary Hardware; 2018.
- E. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.
- F. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Keying Requirements Meeting:
 - 1. Attendance Required:
 - a. Contractor.
 - b. Owner.
 - 2. Agenda:
 - a. Establish keying requirements.
 - b. Establish keying submittal schedule and update requirements.
 - 3. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
 - 4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
 - 5. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

- A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- B. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
 - 1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 - 2. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
 - 3. List groups and suffixes in proper sequence.
 - 4. Provide complete description for each door listed.

5. Provide manufacturer name, product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
- C. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- D. Keying Schedule:
 1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- E. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
 1. Lock Cylinders: Ten for each master keyed group.
 2. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 1. Structural failures including excessive deflection, cracking, or breakage.
 2. Faulty operation of the hardware.
 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
 1. Cylinder Locks and Latches: Ten years, minimum
 2. Manual Surface Door Closer Bodies: Twenty-five years, minimum
 3. Closers: Five years, minimum.
 4. Exit Devices: Five years, minimum.
 5. Locksets and Cylinders: Seven years, minimum.
 6. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.

- C. Provide door hardware products that comply with the following requirements:
1. Applicable provisions of federal, state, and local codes.

2.02 HINGES

- A. Manufacturers:
1. McKinney; an Assa Abloy Group company; MK: www.assaabloydss.com/#sle.
 2. Hager Companies; HA: www.hagerco.com/#sle.
 3. Ives Companyies; IV: www.us.allegion.com/#sle
 4. Stanley, dormakaba Group; ST: www.stanleyhardwarefordoors.com/#sle.
- B. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
 - a. Three hinges: For doors with heights 61 to 90 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

2.03 LOCK CYLINDERS

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
1. Manufacturers:
 - a. Schlage LFIC (SC).
 - b. No Substitution.
- C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Match Facility Standard - contact owner representative for keyway.
 6. Schlage cores and cylinders to be provided by this specification section. These are not owner supplied or installed.
- D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
1. Interchangeable Cores: Core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Jerry Homesat - districts locksmith to be part of the keying meeting.
 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.

3. Existing System: Keying of cylinders and cores Jerry Homesat. Permanent, keyed cylinders and cores to be installed by the hardware supplier.
- F. Key Quantity: Provide the following minimum number of keys:
 1. Change Keys per Cylinder: Two (2).
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
 4. Control Keys: Two (2).
- G. Construction Keying: Provide construction master keyed cylinders.

2.04 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 4. Dustproof Strikes: BHMA A156.16.

2.05 CYLINDRICAL LOCKS

- A. Manufacturers:
 1. Sargent; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
 2. Schlage, an Allegion brand; _____: www.allegion.com/us/#sle.
- B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
 1. Bored Hole: 2-1/8 inch diameter.
 2. Latchbolt Throw: 1/2 inch, minimum.
 3. Backset: 2-3/4 inch unless otherwise indicated.
 4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
 - a. Finish: To match lock or latch.

2.06 WALL STOPS

- A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
 1. Type: Bumper, concave, wall stop.
 2. Material: Aluminum housing with rubber insert.

2.07 WEATHERSTRIPPING AND GASKETING

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- D. Manufacturers:
 1. National Guard Products (NG).
 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 3. Reese Enterprises, Inc. (RE).

2.08 COAT HOOKS

- A. Coat Hooks: Provide on room side of door, screw fastened.
- B. Material: Stainless steel.

2.09 SILENCERS

- A. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
 - 1. Single Door: Provide three on strike jamb of frame.
 - 2. Material: Rubber, black color.

2.10 FINISHES

- A. Finishes: Identified in Door Hardware Schedule on drawings.
- B. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- D. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install each item of mechanical to comply with manufacturer's written instructions and according to specifications.
- C. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- D. Use templates provided by hardware item manufacturer.
- E. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
 - 1. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
 - 2. Mounting heights in compliance with ADA Standards:
- F. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- G. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.03 ADJUSTING

- A. Adjust hardware for smooth operation.
- B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.
- C. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.04 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.
- D. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- E. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.05 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Acoustic insulation.
- C. Gypsum sheathing.
- D. Cementitious backing board.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- B. Section 09 22 16 - Non-Structural Metal Framing.
- C. Section 09 30 00 - Tiling: Tile backing board.

1.03 REFERENCE STANDARDS

- A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2023.
- E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- F. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- H. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- I. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- J. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- K. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2023.
- L. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- M. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- N. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- O. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide data on gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 55-59 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum Company: www.americangypsum.com/#sle.
 - 2. CertainTeed Corporation: www.certainteed.com/#sle.
 - 3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 - 4. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 5. USG Corporation: www.usg.com/#sle.
 - 6. Or approved equal.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold resistant board is required at the following locations.
 - 3. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
- C. Impact Resistant Wallboard:
 - 1. Application: High-traffic areas indicated.
 - 2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 5. Type: Fire-resistance-rated Type X, UL or WH listed.
 - 6. Thickness: 5/8 inch.
 - 7. Edges: Tapered.
 - 8. Paper-Faced Products:
 - a. American Gypsum Company; M-Bloc IR Type X: www.americangypsum.com/#sle.
 - b. CertainTeed Corporation; Extreme Impact Resistant Drywall with M2Tech: www.certainteed.com/#sle.
 - c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Hi-Impact Gypsum Board: www.goldbondbuilding.com/#sle.
 - d. USG Corporation; Sheetrock Brand Mold Tough VHI Firecode X Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
 - e. Or approved equal.
 - 9. Locations:
 - a. All corridor walls
- D. Backing Board For Wet Areas:
 - 1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 1/2 inch.

b. Products:

- 1) PermaBASE Building Products, LLC provided by National Gypsum Company;
PermaBase Cement Board: www.goldbondbuilding.com/#sle.

2.03 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 4 & 6 inch.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
 1. Products:
 - a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant: www.titebond.com/#sle.
 - b. Grabber Construction Products; Acoustic Sealant GSC
 - c. Liquid Nails, a brand of PPG Architectural Coatings;
_____: www.liquidnails.com/#sle.
 - d. Pecora Corporation; AIS-919
 - e. Specified Technologies Inc; Smoke N Sound Acoustical Sealant: www.stifirestop.com/#sle.
 - f. USG Corporation: SHEETROCK Acoustical Sealant
 - g. Or approved equal.
- C. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
 1. Types: As detailed or required for finished appearance.
 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
- D. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Corner Beads: Low profile, for 90 degree outside corners.
 2. L-Trim with Tear-Away Strip: Sized to fit 5/8 inch thick gypsum wallboard.
 3. Expansion Joints:
 - a. Type: V-shaped metal with factory-installed protective tape.
- E. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
 4. Joint Compound: Setting type, field-mixed.
- F. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- G. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
 1. Products:
 - a. CertainTeed Corporation; Level V Wall and Ceiling Primer/Surfer with M2Tech: www.certainteed.com/#sle.
 - b. USG Corporation; USG Sheetrock Brand Tuff-Hide Primer-Surfer: www.usg.com/#sle.
 - c. Or approved equal.
- H. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

- I. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Place two beads continuously on substrate before installation of perimeter framing members.
 - 2. Place continuous bead at perimeter of each layer of gypsum board.
 - 3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.03 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 4. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal partition framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood blocking within stud framing.
- B. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation, gypsum sheathing, cementitious backing board, gypsum wallboard, joint treatment and accessories attached to or within stud framing.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. SCAFCO Corporation: www.scafco.com/#sle.
 - 4. Simpson Strong Tie: www.strongtie.com/#sle.
 - 5. Steel Construction Systems: www.steelconsystems.com/#sle.
 - 6. Or approved equal.

2.02 FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: AISI S220; sheet steel, of size and properties necessary for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Studs: C-shaped with flat faces.
 - 2. Runners: U-shaped, sized to match studs.
 - 3. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
 - 4. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
- B. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code when evaluated in accordance with AISI S100.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50.

2.03 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

- A. Install non-structural members in accordance with ASTM C754.
- B. Extend partition framing to structure in all locations.
- C. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Align and secure top and bottom runners at 24 inches on center.
- E. All partitions to receive acoustic insulation and therefore to receive the following:
 - 1. Place two beads of acoustic sealant between runners and substrate , studs and adjacent construction.
 - 2. Place two beads of acoustic sealant between studs and adjacent vertical surfaces.
- F. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- G. Install studs vertically at 16 inches on center.
- H. Align stud web openings horizontally.
- I. Secure studs to tracks using crimping method. Do not weld.
- J. Stud splicing is not permissible.
- K. Fabricate corners using a minimum of three studs.
- L. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.
- M. Brace stud framing system rigid.
- N. Coordinate erection of studs with requirements of door frames; install supports and attachments.
- O. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- P. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures, wall cabinets, toilet accessories, hardware, and opening frames.
- Q. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION

**SECTION 09 30 00
TILING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for wall applications.
- B. Ceramic accessories.
- C. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS

- A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017.
- B. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
- C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
- D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.
- F. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.
- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).
- K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- L. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Modified Dry-Set Mortar; 2023.
- M. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).
- N. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.
- O. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

- P. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
- Q. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- R. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).
- S. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- T. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- U. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 1 percent of each size, color, and surface finish combination.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products by the same manufacturer.
 - 1. Dal-Tile Corporation; ____: www.daltile.com/#sle.
- B. Porcelain Tile, Type TL-1 & TL-2: ANSI A137.1 standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Color(s): As indicated on drawings.
 - 3. Pattern: As indicated on drawings..

4. Products:
 - a. As indicated on drawings..

2.02 TRIM AND ACCESSORIES

- A. Non-Ceramic Trim: Color noted below, style and dimensions to suit application, for setting using tile mortar or adhesive.
 1. Applications:
 - a. Open edges of wall tile.
 - 1) Basis of Design: Schluter
 - b. Transition between floor finishes of different heights.
 - 1) Basis of Design: Schluter RENO-TK for TL (tile) to CPT (carpet) transition
 - (a) Finish:
 - c. Thresholds at door openings.
 - 1) Basis of Design: Schluter
 2. Manufacturers:
 - a. Schluter-Systems: www.schluter.com/#sle.
 - b. Or approved equal.

2.03 SETTING MATERIALS

- A. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
 1. Products:
 - a. Bostik, Inc: Bosti-Set: www.bostik.com
 - b. Custom Building Products; EBM-Lite Epoxy Bonding Mortar: www.custombuildingproducts.com/#sle.
 - c. LATICRETE International, Inc; LATICRETE LATAPOXY 300 Adhesive: www.laticrete.com/#sle.
 - d. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
 - e. Or approved equal.

2.04 GROUTS

- A. Manufacturers:
 1. Bostik Inc: www.bostik-us.com/#sle.
 2. Custom Building Products: www.custombuildingproducts.com/#sle.
 3. Mapei: www.mapei.com
 4. Or approved equal.
- B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 1. Applications: Floors and Walls.
 2. Color(s): As selected by Architect from manufacturer's full line.

2.05 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
 1. Applications: Between tile and plumbing fixtures.
 2. Color(s): Provide sanded color matched sealant to match grout.

2.06 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 1. Crack Resistance: No failure at 1/8 inch gap, minimum.
 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber or Acrylic.
 - b. Thickness: 20 mils, maximum.
 - c. Products:
 - 1) LATICRETE International, Inc; LATICRETE Blue 92 Anti-Fracture Membrane: www.laticrete.com/#sle.

- 2) Merkrete, by Parex USA, Inc; Merkrete Fracture Guard: www.merkrete.com/#sle.
 - 3) Or approved equal.
- B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control and expansion joints free of mortar, grout, and adhesive.
- J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- K. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- L. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - WALL TILE

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

3.05 CLEANING

- A. Clean tile and grout surfaces.

3.06 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

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**SECTION 09 51 00
ACOUSTICAL CEILINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

- A. Product Data: Provide data on suspension system components and acoustical units.
- B. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.05 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acoustic Tiles/Panels (ACT-1):
 - 1. Armstrong World Industries, Inc; ____: www.armstrongceilings.com/#sle.
 - 2. CertainTeed Corporation; ____: www.certainteed.com/ceilings-and-walls/#sle.
 - 3. USG Corporation; ____: www.usg.com/ceilings/#sle.
 - 4. Or approved equal.
- B. Suspension Systems:
 - 1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

- A. Acoustical Panels: To match those provided as part of previous HVAC project
 - 1. Size: 24 by 24 inches.
 - 2. Thickness: 3/4 inch.
 - 3. Panel Edge: Reveal.
 - 4. Color: White.
 - 5. Suspension System: Exposed grid.

2.03 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, stabilizer bars, clips, and splices as required.
 - 1. Materials:
 - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
- B. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.

1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
2. Profile: Tee; 15/16 inch face width.
3. Finish: Baked enamel.
4. Color: White

2.04 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
- D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
- B. 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.
 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structures that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - a. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - b. Do not attach hangers to steel deck tabs.
 - c. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - d. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - e. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - f. Install minimum of four (4) wire hangers at light fixtures, within 6-inches from each corner of the light fixture.
 5. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs.

- C. Support for Recessed and Semi-recessed Grid-Type Light Fixtures: Units may be supported from suspended ceiling support system. Install ceiling support system rods or wires at a minimum of 4 rods or wires for each fixtures, located not more than 6 inches from fixture corners.
 - 1. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near each fixture corner.
 - 2. Fixtures of Sizes less than Ceiling Grid: Center in acoustical panel. Support fixtures independently with at least two $\frac{3}{4}$ -inch metal channels spanning and secured to ceiling tees.
- D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - 2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
- F. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- G. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- H. Locate system on room axis according to reflected plan.
- I. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Overlap and rivet corners.
- J. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- K. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- L. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- M. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- N. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.

2. Make field cut edges of same profile as factory edges.

H. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

**SECTION 09 65 00
RESILIENT FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient base.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

1.03 REFERENCE STANDARDS

- A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

1.04 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- B. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- C. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TV, vinyl, thermoplastic; style as scheduled.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - b. Tarkett: www.commercial.tarkett.com
 - c. Or approved equal.
 - 2. Height: 4 inch.
 - 3. Thickness: 0.125 inch.
 - 4. Finish: Satin.
 - 5. Length: Roll.
 - 6. Color: As indicated on drawings.
 - 7. Accessories: Premolded external corners.

2.02 ACCESSORIES

- A. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.
- D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.04 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

3.05 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

**SECTION 09 67 00
FLUID-APPLIED FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS

- A. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.
- B. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
- B. Samples: Submit two samples, 12 x 12 in size illustrating color and pattern for each floor material for each color specified.
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.05 MOCK-UPS

- A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
 - 1. Number of Mock-Ups to be Prepared: One.
 - 2. Use same materials and methods for use in the work.
 - 3. Locate where directed.
 - 4. Minimum Size: 48 inches by 48 inches.
- B. Obtain approval of mock-up by Architect before proceeding with work.
- C. Approved mock-up may remain as part of the work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.

PART 2 PRODUCTS

2.01 FLUID-APPLIED FLOORING SYSTEMS

- A. Fluid-Applied Flooring Type ER-1: As indicated on drawings.
- B. Fluid-Applied Flooring Type ER-2: As indicated on drawings.

2.02 ACCESSORIES

- A. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.
- B. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive flooring.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 09 05 61.
 - 2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.

3.02 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.
- D. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.

3.04 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

END OF SECTION

**SECTION 09 91 23
INTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- D. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- E. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
- F. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.03 SUBMITTALS

- A. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
 - 2. MPI product number (e.g., MPI #47).
 - 3. Cross-reference to specified paint system products to be used in project; include description of each system.
 - 4. Manufacturer's installation instructions.
- B. Samples: Submit one paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
 - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
 - 4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as factory finished metals, wood cabinets, and wood doors, have been approved.
- C. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets

(MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Paint and Finish Materials: 1 gal of each color; from the same product run, store where directed.
 - 2. Label each container with color in addition to the manufacturer's label.

1.04 QUALITY ASSURANCE

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
- C. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

- b. Architectural coatings VOC limits of the State in which the Project is located.
- 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- D. Colors: As indicated on drawings.
 - 1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, aluminum, and acoustical ceilings.
 - 1. Two top coats and one coat primer.
 - 2. Top Coat(s): Institutional Low Odor/VOC Interior Latex.
- B. Paint I-OP-MD-WC - Medium Duty Vertical and Overhead: Including gypsum board, plaster, concrete, concrete masonry units, uncoated steel, shop primed steel, galvanized steel, and aluminum.
 - 1. Two top coats and one coat primer.
 - 2. Top Coat(s): Institutional Low Odor/VOC Interior Latex.
 - a. Products:
 - 1) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Low Sheen. (MPI #144)
 - 2) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Semi-Gloss.
 - 3) Or similar from approved manufacturer

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
 - 1. Interior Drywall Primer Sealer.
 - a. Products:
 - 1) Sherwin Williams High Build Primer
 - 2) Or similar from approved manufacturer

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Plaster and Stucco: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Concrete:
 - 1. Prepare surface as recommended by top coat manufacturer and in accordance with SSPC-SP 13/NACE No.6.
- F. Masonry:
 - 1. Prepare surface as recommended by top coat manufacturer.
- G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.
- I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- J. Galvanized Surfaces:
- K. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.
- L. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Sand wood and metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 14 00 SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- C. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- D. Verification Samples: Submit samples showing colors specified.
- E. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.05 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flat Signs:
 - 1. ASI Signage Innovations: www.asisignage.com

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 _____, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 1. Sign Type: Flat signs with engraved panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.

3. Character Height: 1 inch.
4. Sign Height: 2 inches, unless otherwise indicated.
5. Colors: As indicated on drawings.

2.03 SIGN TYPES

- A. Flat Signs: Signage media without frame.
 1. Edges: Square.
 2. Corners: Square.
 3. Wall Mounting of One-Sided Signs: Tape adhesive.
 4. Wall Mounting on glass: Tape adhesive with backup cover sign on opposite side of glass. Backup cover sign to be same color as main front sign panel.
- B. Color and Font: Unless otherwise indicated:
 1. Character Font: Helvetica, Arial, or other sans serif font.
 2. Character Case: Upper case only.
 3. Background Color: Clear.
 4. Character Color: Contrasting color.

2.04 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION

**SECTION 10 26 00
WALL AND DOOR PROTECTION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 RELATED REQUIREMENTS

- A. Section 09 22 16 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

1.03 SUBMITTALS

- A. Product Data: Indicate physical dimensions, features, and anchorage details.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Corner Guards:
 - 1. Inpro Corporation; Palladium 3D Trim System: www.inprocorp.com/#sle.

2.02 PRODUCT TYPES

- A. Corner Guards - Flush Mounted:
 - 1. Material: High impact vinyl size and mounting height as indicated on drawings.
 - 2. Width of Wings: 2 inches.
 - 3. Corner: Square.
 - 4. Color: As indicated.
 - 5. Length: One piece.

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

3.02 INSTALLATION

- A. Position corner guard 4 inches above finished floor to 60 inches high.

END OF SECTION

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SECTION 10 28 00 TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. American Specialties, Inc; _____: www.americanspecialties.com/#sle.
 - 2. Bobrick Corporation: www.bobrick.com
 - 3. Bradley Corporation; _____: www.bradleycorp.com/#sle.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- C. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- D. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- E. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Mirrors: Stainless steel framed
 - 1. Size: As indicated on drawings.
 - 2. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.

3. Product Basis of Design: Bobrick B165 Series
4. Size: 48" W x 36" H
 - a. Quantity: One at each location on drawings
- B. Grab Bars: Stainless steel, smooth surface.
 1. Heavy Duty Grab Bars: Floor supports are not acceptable.
 - a. Push/Pull Point Load: Minimum 1000 pound-force, minimum.
 - b. Dimensions: 1-1/2 inch outside diameter, minimum 0.125 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Length and Configuration: As indicated on drawings.
 - d. Product Basis of Design: Bobrick B6806 series
- C. Locker Room Bench: Tube pedestal with plastic bench top.
 1. Basis of design: As indicated on drawings.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Towel Bar: Stainless steel, 3/4 inch round tubular bar; rectangular brackets, concealed attachment, satin finish.
 1. Length: 24 inches.
 2. Products: As indicated on drawings.
- B. Coat Hook: Heavy-duty stainless steel, bracket and backplate for concealed attachment, satin finish.
 1. Products:
 - a. Bobrick B-6827.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
 1. Grab Bars: As indicated on drawings.
 - a. Configuration and Length
 - 1) Beside water closets: 3'-6" horizontally and 1'-6" vertically.
 - 2) Behind water closets: 3'-0" horizontally
 2. Mirrors: As indicated on the drawings

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 12 36 00 COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Countertops for architectural cabinet work.
- B. Countertops for manufactured casework.

1.02 RELATED REQUIREMENTS

- A. Section 12 32 00 - Manufactured Wood Casework.

1.03 REFERENCE STANDARDS

- A. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- C. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- E. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
- D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- F. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.

2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Wilsonart; _____: www.wilsonart.com/#sle.
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - d. Color and Pattern: As indicated on drawings.
3. Other Components Thickness: 1/2 inch, minimum.
4. Exposed Edge Treatment: Built up to minimum 1 inch thick; bullnosed edge.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 - a. Fabricate tops with loose backsplashes for field application.
6. Fabricate in accordance with manufacturer's standard requirements.
7. Selections and locations as indicated on drawings.

2.02 MATERIALS

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
- C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- D. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 1. Join lengths of tops using best method recommended by manufacturer.
 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

- A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

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==== END OF SECTION 01100 ====

SPECIAL PROVISIONS
PROJECT MANUAL - MECHANICAL
SECTION 01200

DIVISION 22 – PLUMBING

22 0010	PLUMBING GENERAL PROVISIONS
22 0500	COMMON WORK RESULTS FOR PLUMBING
22 0516	EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING
22 0519	METERS AND GAGES FOR PLUMBING PIPING
22 0523	GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 0529	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 0553	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 0700	PLUMBING INSULATION
22 1116	DOMESTIC WATER PIPING
22 1123	DOMESTIC WATER PUMPS
22 1316	SANITARY WASTE AND VENT PIPING
22 1413	FACILITY STORM DRAINAGE PIPING
22 1516	FACILITY NATURAL GAS AND COMPRESSED AIR PIPING
22 3400	FUEL-FIRED DOMESTIC WATER HEATERS
22 4000	PLUMBING FIXTURES

SECTION 22 00 10
PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.01 GENERAL

- A. Refer to Division 00 – Procurement, Contracting and Warranty Requirements and Division 01 - General Requirements, which all apply to work under this section.

1.02 DESCRIPTION OF WORK

- A. This section applies to all work under the plumbing contract. This shall include, but not necessarily be limited to, the following:
1. Waste and Vent Systems
 2. Hot and Cold Water Distribution System
 3. Plumbing Fixtures
 4. Water Heating Systems
 5. Sanitary Sewer
 6. Piping Insulation
 7. Natural Gas System
- B. The work shall include all materials, equipment and labor required for complete and properly functioning plumbing systems.
- C. Drawings for plumbing work are in part diagrammatic, intended to convey the scope of work and indicate general arrangement of equipment, piping and approximate sizes and locations of equipment and materials.
- D. Where job conditions require reasonable changes in indicated locations and arrangements, make such changes without additional cost to Owner.
- E. Because of the scale of the drawings, certain piping or items such as unions or fittings may not be shown, but where such items are required by other sections of the specifications, or where they are required by the nature of the work, they shall be furnished and installed.
- F. All elements of the construction shall be performed by work skilled in the particular craft involved, and regularly employed in that particular craft.
- G. All work shall be performed in a neat, workmanlike manner in keeping with the highest standards of the craft.

1.03 CODES AND STANDARDS

- A. All work shall be done in accordance with the applicable portion of the following codes and standards:
1. International Fire Suppression Code
 2. Uniform Fire Suppression Code
 3. Iowa State Plumbing Code
 4. Iowa State Mechanical Code
 5. International Building Code
 6. Uniform Building Code
 7. National Electric Code (NEC)
 8. National Fire Protection Association Standards (NFPA)
 9. Local Utility Company Requirements
 10. Local Codes, all trades
 11. Standards of ASME, ASHRAE, NEMA, IEEE, AGA, SMACNA
 12. Occupational Safety and Health Administration (OSHA)
 13. Underwriters Laboratories, Inc. (U.L.)
 14. Iowa Administrative Codes
 15. Americans With Disabilities Act (ADA)
 16. ANSI/NSF 372

- B. Contractors shall familiarize themselves with all codes and standards applicable to their work and shall notify Design Professional of any discrepancies between the design and applicable code requirements so that any conflicts can be resolved. Where two or more codes or standards are in conflict, that requiring the highest order of workmanship shall take precedence, but such questions shall be referred to Design Professional for final decision.
- C. Where drawings or specifications call for workmanship or materials in excess of code requirements, a lower grade of construction will not be permitted.

1.04 REQUIREMENTS & FEES OF REGULATORY AGENCIES

- A. Contractor shall comply with the rules and regulations of the authorities having jurisdiction and local utility companies. Contractor shall check with each utility company providing service to this project and determine or verify their requirements regarding incoming services.
- B. Meters for incoming services shall be selected based on the project requirements. Any questions concerning this shall be referred to Design Professional prior to bidding. Contractor shall provide the appropriate meter and associated materials if not furnished by the utility company.
- C. Secure all required permits and pay for all inspections, licenses and fees required in connection with the plumbing work. Contractor shall post all bonds and obtain all licenses required by the State, City, County and Utility.
- D. Contractor shall make all arrangements with each utility company and pay all service charges associated with new service.

1.05 PLUMBING DRAWINGS

- A. The plumbing drawings indicate in general the building arrangement only, Contractor shall examine construction drawings to familiarize himself with the specific type of building construction, i.e. type of structural system, floors, walls, ceilings, room finishes and elevations.
- B. Drawings are intended to convey the scope of the work and to indicate the general arrangement and locations of piping and equipment.
- C. Contractor shall layout their own work and shall be responsible for determining the exact locations for equipment and rough-ins and the exact routing of piping so as to best fit the layout of the work.
- D. Contractor shall take their own field measurements for verifying locations and dimensions: scaling of the drawings will not be sufficient for laying out the work.
- E. Because of the scale of the drawings, certain basic items such as pipe fittings and valves may not be shown, but where such items are required by code or by other sections of the specifications, such items shall be furnished and installed.

1.06 ACTIVE SERVICES

- A. Contractor shall be responsible for verifying exact location of all existing services prior to beginning work in that area.
- B. Existing active services, i.e., water, gas, sewer, electric, when encountered, shall be protected against damage. Do not prevent or disturb operation of active services which are to remain.
- C. When active services are encountered which require relocation, Contractor shall make request to authorities with jurisdiction for determination of procedures.
- D. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the authorities having jurisdiction.

1.07 SITE INSPECTION

- A. Contractor shall inspect the site prior to submitting bid for work to familiarize himself with the conditions of the site which will affect their work and shall verify points of connection with utilities, routing of outside piping to include required clearances from any existing structures, trees or other obstacles.
- B. Extra payment will not be allowed for changes in the work required because of Contractor's failure to make this inspection.

1.08 COORDINATION AND COOPERATION

- A. It shall be Contractor's responsibility to schedule and coordinate their work with the schedule of the General Contractor so as to progress the work expeditiously, and to avoid unnecessary delays.
- B. Contractor shall fully examine the drawings and specifications for other trades and shall coordinate the installation of their work with the work of the other contractors. Contractor shall consult and cooperate with the other contractors for determining space requirements and for determining that adequate clearance is allowed with respect to their equipment, other equipment and the building. Design Professional reserves the right to determine space priority of the contractors in the event of interference between piping, conduit, ducts and equipment of the various contractors.
- C. Drawings and specifications are intended to be complimentary. Any work shown in either of them, whether in the other or not, shall be executed according to the true intent and meaning thereof, the same as if set forth in all. Conflicts between the drawings and the specifications or between the requirements set forth for the various contractors shall be called to the attention of Design Professional. If clarification is not asked for prior to the taking of bids, it will be assumed that none is required and that Contractor is in agreement with the drawings and specifications as issued. If clarification is required after the contract is awarded, such clarification will be made by Design Professional and their decision will be final.
- D. Special care shall be taken for protection for all equipment. All equipment and material shall be completely protected from weather elements, painting and plaster until the project is substantially completed. Damage from rust, paint and scratches shall be repaired as required to restore equipment to original condition.
- E. Protection of all equipment during the painting of the building shall be the responsibility of the Painting Contractor, but this shall not relieve Contractor of the responsibility for checking to assure that adequate protection is being provided.
- F. Where the final installation or connection of equipment in the building requires Contractor to work in finished areas of the building, Contractor shall be responsible that such areas are protected and are not marred, soiled or otherwise damaged during the course of such work. Contractor shall arrange with the General Contractor for patching and refinishing of such areas which may be damaged in this respect.

1.09 OPENINGS, CUTTING AND PATCHING

- A. Piping and sleeves passing through all fire or smoke rated floors, roofs, walls, and partitions shall be provided with firestopping. Space between wall/floor and pipe and/or sleeve shall be sealed with UL listed intumescent fire barrier material equivalent to rating of wall/floor. Where piping and sleeves pass through floors, roofs, walls and partitions that are not fire or smoke rated, penetrations shall be sealed with grout or caulk. Refer to Section 07 84 00 – Firestopping and Section 07 92 00 – Joint Sealants for additional information.
- B. New structure:
 - 1. Contractor will coordinate the placing of openings and lintels in the new structure as required for the installation of the plumbing work with the General Contractor.
 - 2. Contractor shall furnish to General Contractor the accurate locations and sizes for required openings, but this shall not relieve Contractor of the responsibility of checking to assure that proper size openings are provided. When additional cutting and patching is required due to Contractor's failure to coordinate this work, Contractor shall make arrangements for the cutting, patching, and painting required.
- C. Existing Structure:
 - 1. Contractor shall provide cutting, lintels and patching, and patch painting in the existing structure, as required for the installation of their work, and shall furnish lintels and supports as required for openings.

2. Cutting of structural support members will not be permitted without prior approval of the Design Professional. Extent of cutting shall be minimized; use core drills, power saws or other machines which will provide neat, minimum openings.
3. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.

1.10 EXCAVATING AND BACKFILLING

- A. Contractor shall do all excavating necessary for sanitary sewers, storm sewers, water piping, gas piping, etc., and shall backfill trenches and excavations after work has been inspected. Care shall be taken in excavating that walls and footings and adjacent load bearing soils are not disturbed in any way, except where lines must cross under a wall footing. Where a line must pass under a footing, the crossing shall be made by the smallest possible trench to accommodate the pipe. Excavation shall be kept free from water by pumping if necessary.
- B. Backfill about the structure shall be placed, when practical, as the work of construction progresses. Backfilling on or against concrete work shall be done only when directed. Backfilling of trenches shall progress as rapidly as the testing and acceptance of the finished sections of the work will permit. Backfill shall be in accordance with Division 31 Specifications.
- C. Backfill about the structure shall be placed, when practical, as the work of construction progresses. Backfilling on or against concrete work shall be done only when directed. Backfilling of trenches shall progress as rapidly as the testing and acceptance of the finished sections of the work will permit and shall be carried to a crown approximately six (6) inches above existing grades. In backfilling trenches, selected material shall be compacted firmly around and to a depth of not less than six (6) inches over the top of work in trench. All fill and backfill and rough grading shall be compacted thoroughly in layers and shall be brought up to within six (6) inches of finished grades. All fill and backfill shall be sand or pit run sand/gravel graded from 1" size downward, if excavated material is not suitable for backfill.

1.11 MATERIALS AND EQUIPMENT

- A. All materials and equipment shall be the standard product of a reputable U.S.A. manufacturer regularly engaged in the manufacture of the specified item. Where two or more units are required of the same item, they shall be furnished by the same manufacturer except where specified otherwise.
- B. All material and equipment shall be installed in strict accordance with the manufacturer's recommendations.
- C. The equipment specifications cannot deal individually with any minute items such as parts, controls, devices, etc., which may be required to produce the equipment performance and function as specified, or as required to meet the equipment guarantees. Such items, when required, shall be furnished as part of the equipment, whether or not specifically called for.

1.12 SUBMITTALS

- A. Contractor shall furnish, to Design Professional, complete sets of shop drawings and other submittal data. Contractor shall review and sign shop drawings before submittal. Refer to Division 01 specifications for additional requirements.
- B. Shop drawings shall be bound into sets and cover related items for a complete system as much as practical and shall be identified with symbols or "plan marks" used on drawings. Incomplete, piecemeal or unbound submittals will be rejected.
- C. Submittal requirements are indicated in each corresponding technical specification section in the Project Manual.
- D. After award of contract, Contractor shall provide a completed submittal schedule including dates that the submittals will be to Design Professional for review.
- E. Design Professional will review shop drawings solely to assist contractors in correctly interpreting the plans and specifications.
- F. Contract requirements cannot be changed by shop drawings which differ from contract drawings and specifications.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. Operation and maintenance manuals shall be submitted to Design Professional in bookmarked pdf and duplicate printed hard copy upon completion of the job. Refer to Division 01 specifications for additional information.
- B. Submit manuals in duplicate upon completion of the job. Manuals shall be bound in a three ring hard-backed binder. Front cover and spine of each binder shall have the following lettering done:

OPERATION
AND
MAINTENANCE
MANUAL
FOR
PLUMBING SYSTEMS

(PROJECT NAME)
(LOCATION)
(DATE)

SUBMITTED BY
(NAME AND ADDRESS OF CONTRACTOR)

- C. Provide a master index at the beginning of manual showing items included. Use plastic tab indexes for sections of manual. Each section shall contain the following information for equipment furnished under this contract:
 - 1. Equipment and system warranties and guarantees.
 - 2. Installation instructions.
 - 3. Operating instructions.
 - 4. Maintenance instructions.
 - 5. Spare parts identification and ordering list.
 - 6. Local service organization, address, contract and phone number.
 - 7. Shop drawings with reviewed stamp of Design Professional and Contractor shall be included, if applicable, along with the items listed above.
 - 8. Reports of all tests and demonstrations including certificate of owner instruction, testing and balancing report, etc.

1.14 TRAINING AND DEMONSTRATIONS

- A. Prior to acceptance of the plumbing installation, Contractor shall provide to Owner, or their designated representatives, all comprehensive training on essential features and functions of all systems installed, and shall instruct Owner in the proper operation and maintenance of such systems.
 - 1. Provide adequate notice to Owner as to when instruction will be conducted so appropriate personnel can be present.
 - 2. Prepare the instruction format for a minimum of four Owner Representatives.
- B. System training:
 - 1. These sessions shall include hands-on demonstrations of system wide start-up, operation in all possible modes, shut-down and emergency procedures.
 - 2. System training shall include, but not be limited to, valve locations, system routing, and air/water flow patterns, system start-up/shut-down/emergency procedures.
- C. Contractor shall submit to Design Professional a certificate, signed by Owner stating the date, time and persons instructed and that the instruction has been completed to Owner's satisfaction. An example of a certificate form is as follows:

CERTIFICATE OF SYSTEM DEMONSTRATION

This document is to certify that Contractor has demonstrated the hereafter listed systems to Owner's representatives in accordance with the Contract documents and that the instruction has been completed to Owner's satisfaction.

A. Project:

B. System(s):

C. Contractor's representatives giving instruction and demonstration:

Contractor: _____

NAMES	DATE	HOURS

D. Owner's representatives receiving instruction:

Owner: _____

NAMES	DATE	HOURS

E. Acknowledgement of demonstration:

Contractor's Representative:

Signature

date

Owner's Representative:

signature

date

1.15 SUBSTITUTIONS

- A. Refer to Divisions 00 and 01.
- B. To obtain approval to use unspecified equipment, submit written requests to the Design Professional at least 10 days prior to bid due date. Requests shall clearly describe the equipment for which approval is being requested. Include all data necessary to demonstrate that equipment's capacities, features and performance are equivalent to include a cost comparison between specified equipment and equipment for which approval is being requested. If the equipment is acceptable, Design Professional will approve it in an addendum. Design Professional will, under no circumstances, be required to prove that an item proposed for substitution is or is not of equal quality to the specified item.
- C. Where substitutions are approved, Contractor assumes all responsibility for physical dimensions and all other resulting changes. This responsibility extends to cover all extra work necessitated by other trades as a result of the substitution.

1.16 ACCEPTABLE MANUFACTURERS

- A. In most cases, equipment specifications are based on a specific manufacturer, model, type, style, dimensional data, catalog number, etc. Listed with the base specification, either in the manual or on the plan schedules are acceptable manufacturers approved to bid products of equal quality. These manufacturers are encouraged to submit to Design Professional at least 8 days prior to the bid due date drawings and catalog numbers of products to be bid as equals.
- B. Manufacturers who do not submit prior to bidding, run the risk of having the product rejected at time of shop drawing submittal. Extra costs associated with replacing the rejected product shall be the responsibility of Contractor and/or the manufacturer.
- C. If Contractor chooses to use a manufacturer listed as an equal, it shall be their responsibility to assure that the manufacturer has complied with the requirements in 'A' above. Contractor shall assume all responsibility for physical dimensions (including accessibility for maintenance), operating characteristics, and all other resulting changes. This responsibility extends to cover all extra work necessitated by other trades as a result of using the alternate manufacturer.
- D. Where a model or catalog number is provided, it may not be inclusive of all product requirements. Refer to additional requirements provided on the plans or in the specifications as required. Similarly, there may be additional requirements included in the model or catalog number that are not specifically stated. These requirements shall also be met.

1.17 WARRANTY

- A. Refer to Divisions 00 and 01 for information on warranties and correction of work within the warranty period.
 - 1. If a warranty or warranty period are not defined in Division 00 or 01, then the start of all warranty periods shall be the date of Substantial Completion and the length of the warranty shall be for one year.
 - a. If construction is phased with distinct and separate Substantial Completion dates for portions of the building and/or systems, separate warranties shall be provided for each of these phased areas and/or systems.
 - b. The entire Plumbing system, including all sub-systems, shall be guaranteed against defect in materials and installation for the duration of the warranty period. Any malfunctions or defects which occur within the warranty period shall be promptly corrected without cost to the Owner. This guarantee shall not limit or void any manufacturer's express or implied warranty.
- B. Refer to other Division 22 sections for systems, equipment, or material requiring extended warranties.
- C. The date of systems/equipment startup or equipment/material shipment to the site shall not be considered the notable date with relation to the warranty of that item. All systems, equipment, material, etc., shall have the same start date with respect to the warranty period.

- D. Systems, equipment or material put into use to facilitate construction activities (e.g. testing and balancing, commissioning, temporary conditioning, etc.) prior to the start of the warranty period shall not impact the length of the warranty in any way.

1.18 CHANGES IN THE WORK

- A. A contract change order is a written order to Contractor signed by Owner and Contractor, issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or the contract time. The contract sum and the contract time may be changed only by contract change order.
- B. Owner, without invalidating the contract, may order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions, with the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by contract change order and shall be performed under the applicable conditions of the contract documents.
- C. The cost or credit to Owner resulting from a change in the work shall be determined by mutual acceptance of a lump sum properly itemized and supported by sufficient substantial data to permit evaluation. A change order in excess of \$300.00 shall be submitted with each item listed individually with a material cost and labor unit extension. Overhead and profit, as mutually agreed upon between Owner and Contractor shall be added to material and labor cost figures.
- D. It shall be the responsibility of Contractor before proceeding with any change to satisfy himself that the change has been properly authorized in behalf of Owner.

1.19 COMPLETION

- A. Systems, at time of completion, shall be complete, efficiently operating, non-hazardous and ready for normal use by Owner.
- B. Contractor shall clean up and remove from the site all debris, excess material and equipment left during the progress of this contract at job completion.

1.20 CLEANING

- A. At the conclusion of the construction, the entire system of piping and equipment shall be cleaned internally.
- B. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. Name plates, ratings, instruction plates, etc., shall not be obscured by paint, insulation, or placement of units.
- C. Before being placed in service, all domestic water distribution systems, including those for cold water and hot water shall be chlorinated as required per Section 22 11 16 - Domestic Water Piping.

1.21 ELECTRICAL WORK

- A. Electrical work and equipment provided by Contractor shall include the following:
 - 1. Starters and disconnects for motors of plumbing equipment, but only where specifically indicated to be furnished integrally with equipment.
 - 2. Wiring from motors to disconnect switches or junction boxes for motors of plumbing equipment, but only where specifically indicated to be furnished integrally with equipment.
 - 3. All control wiring in accordance with the requirements of Division 26.
- B. Electrical Contractor shall provide all power wiring for plumbing equipment, including services for motors and equipment furnished by the plumbing contractor. Motor and equipment locations are shown on the electrical drawings.
- C. Electrical Contractor shall make final connections for all motors and equipment furnished by the plumbing contractor.
- D. Electrical Contractor shall furnish safety disconnects and starters for all motors and equipment furnished by the plumbing contractor (unless specifically indicated to be furnished integrally with the equipment), so as to make service complete to each item of equipment.

- E. Contractor shall consult with Electrical Contractor prior to conduit rough-in and shall verify with him the exact locations for rough-ins, and the exact size and characteristics of the services required, and shall provide Electrical Contractor a schedule of electrical loads for the equipment furnished by him. These schedules will be used for sizing services, disconnects, fuses, starters and overload protection.

1.22 TEMPORARY UTILITIES

- A. Refer to Division 01 for specific requirements concerning temporary utilities.

END OF SECTION 22 00 10

SECTION 22 05 00
COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.01 GENERAL

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. This section includes the following:
 - 1. Demolition
 - 2. Sleeves
 - 3. Escutcheons

PART 2 - PRODUCTS

2.01 DEMOLITION MATERIALS

- A. All materials removed shall be the property of the removing contractor and shall be removed from the site by him, unless otherwise specified.

2.02 SLEEVES

- A. Sleeves passing through non load bearing walls and partitions shall be galvanized sheet steel with lock seam joints of minimum gauges as follows:
 - 1. For pipes 2 1/2" and smaller 24 gauge
 - 2. For pipes 3" to 6" 22 gauge
 - 3. For pipes over 6" 20 gauge
- B. Sleeves passing through load bearing walls, concrete beams, fireproof walls, foundations, footings and waterproof floors shall be Schedule 40 steel pipe or cast iron pipe.
- C. Sleeves are not required in masonry walls which are core drilled or walls of drywall construction, except where partition is a firestop, smokestop, or side of air plenum.
- D. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.
- E. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions and ceilings, and shall extend 1/2" above finished floors. Extend sleeves 1" above finished floors in areas likely to entrap water and fill space between sleeves and pipe with graphite packing and caulking compound.
- F. Sleeves passing through membrane waterproofing or lead safe shall be provided with flashing, furnished and installed by General Contractor, extending 12" beyond sleeve in all directions; flashing shall be secured and sealed to membrane or lead safe and shall be sealed to sleeve and caulked watertight. Sleeves passing through roof shall be installed in same manner except sleeves shall extend to 6" above roof.
- G. For exterior walls below grade, penetrations shall be watertight. Penetrations shall be sealed with modular mechanical rubber links tightened with bolts (Link-Seal or equal). New construction shall use water-tight sleeves approved by the sealing assembly manufacturer. Waterproofing of pipe penetrations in exterior walls shall be coordinated with waterproofing contractor.

2.03 ESCUTCHEONS

- A. Provide chrome plated escutcheons at each sleeved opening into finished spaces. Escutcheons shall fit around insulation or around pipe when not insulated; outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall be high cap type and shall clear sleeve extension. Secure escutcheons or plates to sleeve but not to insulation with set screws or other approved devices.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. General:
 - 1. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.
 - 2. Contractor shall remove existing equipment and piping not necessary for additions or existing portions of building as indicated on drawings and/or specified herein. To include all abandoned equipment and piping back to point of origin. Demolition of equipment shall include removal of associated concrete equipment pad and/or support steel.
 - 3. Contractor shall be responsible for the cutting and capping of all existing services before any work is commenced by the General Contractor.
- B. Work by Others: Unless specifically noted under other contracts, Contractor shall assume all required work shall be performed by him. In general, the following will be performed by others:
 - 1. General Contractor will remove any floors, walls and ceilings, neatly patch, match, complete and finish all affected surfaces.
 - 2. Electrical Contractor will disconnect all electrical services and remove abandoned conduit back to point of origin.
- C. Existing Conditions:
 - 1. If any piping serving existing fixtures or equipment which are to remain are disturbed by operations under this Contract, Contractor shall provide pipe and insulation required to reestablish continuity of such piping systems.
 - 2. Contractor shall arrange for General Contractor to repair, patch and paint all construction, with material necessary to match surrounding material, which is necessary due to removal of equipment and piping.
 - 3. Contractor shall furnish all required labor and material where required to extend new work to connect to similar work where new addition adjoins existing building and for extension of existing system. Connection shall be made in a suitable manner.
- D. Owner's Right of Salvage: The Owner may designate and have salvage rights to any material herein demolished by the Contractor.

3.02 SLEEVES

- A. Install sleeves for all piping passing through floors, roof, walls, concrete beams and foundations as required by this section.

3.03 ESCUTCHEONS

- A. Install escutcheons for all pipes entering finished spaces.

END OF SECTION 22 05 00

SECTION 22 05 16
EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this Section.

1.02 DESCRIPTION OF WORK

- A. Provide material, equipment, labor and supervision necessary to install expansion joints and pump connections as required by the drawings and this section.
- B. Any expansion indicated per plans has been based on copper pipe. If Contractor should choose to use an alternate approved material, he shall be responsible for any resulting changes in expansion.

1.03 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information.
 - 1. Manufacturer's catalog cut sheets and schedules for all mechanical joints and pump connectors.

1.04 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Expansion Compensation Products
 - 1. Flexonics
 - 2. Metraflex
 - 3. Victaulic
 - 4. Minnesota Flexible
 - 5. Keflex
 - 6. Twin City Hose
 - 7. Tri-State Industries
 - 8. Mason Industries

2.02 WATER MAINS

- A. Mechanical Expansion Compensator for 2" diameter and smaller copper pipe: Externally pressurized, all bronze with either stainless steel or bronze bellows, brass or copper shroud and end fittings, internal guides and internal anti-torque device. 150 psi minimum design pressure. Metraflex Model HPFF.
- B. Mechanical Expansion joint for 2-1/2" diameter and larger: Self equalizing, ring controlled bellows, stainless steel shroud and end fittings, internal guides and internal anti-torque device. 300 psi design temperature. Metraflex Model MC.
- C. Mechanical Expansion Joints for Grooved Pipe: Typical installation shall be approved by submittal.
- D. Pipe Guides: Pre-insulated alignment guides, Keflex series CP.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Provide for taking up expansion in hot water mains and risers by means of installing loops, bends and mechanical expansion joints.
- B. Use swing or swivel joints for connections from mains to risers and from risers to coils and equipment connections. Cold spring pipe during installation at points of bends or offsets.
- C. Install anchoring as required for controlling expansion. Structural members for anchoring shall be firmly embedded or fastened into building members and shall withstand force of pipe expansion without straining building structure.
- D. Where expansion joints and/or loops are installed, piping shall be properly guided and anchored as recommended by expansion joint manufacturer.

END OF SECTION 22 05 16

SECTION 22 05 19
METERS AND GAUGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this Section.

1.02 DESCRIPTION OF WORK

- A. Provide material, equipment, labor and supervision necessary to install meters and gauges as required by the drawings and this section.

1.03 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's catalog cuts showing complete descriptive data for all devices required

1.04 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Gauges (For Water)
 - 1. Weiss Series LF402 (Base Specification)
 - 2. Dwyer
 - 3. Taylor
 - 4. Weksler
 - 5. U.S. Gauge
 - 6. Trerice
 - 7. Miljoco

2.02 GAUGES

- A. Weiss Series 4" liquid filled compound pressure-vacuum gauge with snubber, stainless steel case, white dial, 1/4" male NPT, lead free brass and solder connection. Gauges shall be accurate to 1 percent of the full scale. Range 30" vacuum to 100 lb. pressure for water. Note: For outside applications use silicon filled gauge.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Provide a 1/4" ball valve upstream of all gauges.
- B. Install gauge for each pump, mounted on 1/4" copper tube pipe manifold connected to the suction and discharge of the pump, with ball valves in the manifold on each side of the gauge, so that the gauge may be opened to either the suction or discharge pressure.
- C. Install gauges at pressure reducing valves and at other points as indicated on drawings.

END OF SECTION 22 05 19

SECTION 22 05 23
GENERAL DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Provide material, equipment, labor and supervision necessary to install valves as required by the drawings and this section.

1.03 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturers cut sheets and schedules including physical dimensions, construction materials, and pressure and temperature ratings.

1.04 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

1.05 QUALITY ASSURANCE

- A. ANSI/NSF 372 Certification: All potable water supply piping valves (excluding main gate valves greater than 2") shall meet the requirements of ANSI/NSF 372 Certification, Drinking Water System Components, Lead Content.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Gate Valves and Check Valves
 - 1. NIBCO
 - 2. Powell
 - 3. Milwaukee
 - 4. Watts
 - 5. Clow
- B. Ball Valves
 - 1. Watts
 - 2. Milwaukee
 - 3. NIBCO
 - 4. Apollo
 - 5. Viega
- C. Domestic Hot Water Recirculation Balancing Valves
 - 1. Taco
 - 2. Bell & Gossett
 - 3. Wheatley
 - 4. Armstrong
 - 5. Flow Design Inc. (Flow Set)
 - 6. Griswold
 - 7. NIBCO

- D. All valves of same type shall be of the same manufacturer unless otherwise specified in this section or on the drawings.
- E. Model numbers in valve schedule based on NIBCO, unless noted otherwise.

2.02 VALVE CONSTRUCTION

- A. Gate valves shall have solid tapered wedge, except where otherwise specified.
- B. Check Valves: 2" and smaller, horizontal swing type with Teflon seat, bronze lead free body. 200 psi, CWP and 300 deg. F maximum temperature. 2-1/2" and larger, flanged silent check type with bronze mounted bolted bonnet and renewable seat and disc, ductile iron body, 150 psi at 366 deg F conforming to MSS SP-136.
- C. Ball Valves 4" and smaller: Bronze or brass two-piece with stainless steel ball, teflon seats and stuffing box ring, vinyl insulated lever handle.
 - 1. Full port for valves 2-1/2" and smaller.
 - 2. Standard port for valves 3" and larger.
- D. Domestic hot water recirculation balancing valves: Bell & Gossett Model CB "Circuit Setter" or equal.
 - 1. Ball type valve with brass body and stainless-steel ball construction, glass and carbon fitted TFE seat rings, extended readout ports with integral check valves and gasketed caps, drain port, calibrated nameplate and position indicator, memory stops, and NPT connectors, rated for 300 psig at 250°F.
 - 2. Valves to seal leak-tight at maximum rated working pressure.
 - 3. Valves to be selected for 5 ft. pressure drop at full open setting and design water flow.

2.03 VALVE SCHEDULE

- A. Furnish valves as per the following schedule:

<u>Service</u>	<u>Valve type</u>
Domestic hot and cold-water pressures up to 200 psi	Ball - 2-1/2" and smaller, S-685-66-LF (bronze)/S-FP600A-LF (brass) Ball - 3" and 4", T-FP600A-LF Check - 2" and smaller, T/S413Y-LF 2-1/2" and larger, 910-LF
Domestic hot water recirculation valves	All sizes – Bell & Gossett Model CB circuit setter.

- B. Valves installed on all systems with insulated piping shall be provided with valve handle extensions and/or extended neck design to facilitate installation of insulation and make handles operable without damage to the insulation.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install valves in accessible location in general locations indicated on the drawings and as called for in other sections.
- B. Install valves in equipment rooms to provide easy access to valve. Gate and butterfly valves installed 8'-0" above the floor shall be provided with chain operator. Bottom of chain operator shall be 7'-0" above floor.
- C. Check valves shall not be installed in vertical runs of piping unless they are specifically designed for vertical operation.

END OF SECTION 22 05 23

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this Section.

1.02 DESCRIPTION OF WORK

- A. Provide materials, equipment, labor and supervision necessary to install hangers, supports, anchors, guides and seals as required by the drawings and this section.
- B. Types of supports, anchors and seals specified in this section include the following:
 - 1. Horizontal Piping Hangers and Supports.
 - 2. Vertical Piping Clamps.
 - 3. Hanger Rod Attachments.
 - 4. Building Attachments.
 - 5. Saddles and Shields.
 - 6. Miscellaneous Materials.
 - 7. Anchors.

1.03 QUALITY ASSURANCE

- A. Code Compliance: Comply with applicable plumbing and mechanical codes pertaining to product materials and installation of supports, anchors and seals.
- B. UL and FM Compliance: Provide products which are Underwriters Laboratories listed and Factory Mutual approved.
- C. ANSI Compliance: All supports and parts shall conform to the latest requirements of the ANSI Code for Pressure Piping B31.1.0 except as supplemented or modified by the requirements of this specification.

PART 2 - PRODUCTS

2.01 HANGERS, SUPPORTS AND ACCESSORIES (Reference Catalog Figure numbers from Anvil)

- A. Pipe support systems shall secure pipes in place, prevent pipe vibration, provide vertical adjustment for maintaining required grades, and provide for expansion and contraction.
- B. Pipe hangers shall be capable of supporting the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being induced into the pipe or connected equipment.
- C. Wherever possible, pipe attachments for horizontal piping shall be pipe clamps.
- D. Wherever possible, structural attachments shall be beam clamps.
- E. All rigid hangers shall provide a means of vertical adjustment after erection.
- F. Hanger rods shall be subject to tensile loading only. At hanger locations where lateral or axial movement is anticipated, suitable linkage shall be provided to permit swing.
- G. Where horizontal piping movements are greater than 1/2 inch, or where the hanger rod angularity from the vertical is greater than 4 degrees from the cold to hot position of the pipe, the hanger pipe and structural attachments shall be offset in such manner that the rod is vertical in the hot position.
- H. Hangers shall be designed so that they cannot become disengaged by movements of the supported pipe.
- I. Where supports are attached to concrete or other structural members, care shall be taken to prevent damage or weakening of the structural members.

- J. Where concrete inserts are used, it shall be the Contractor's responsibility to accurately locate and attach inserts to concrete forms.
- K. Hangers and supports that are in direct contact with copper piping shall be copper plated or have nonmetallic coating for electrolytic protection.

PART 3 - EXECUTION

3.01 INSTALLATION HORIZONTAL PIPE SUPPORT

- A. Steel and stainless-steel pipe shall be supported at a maximum span of 10 feet for all pipe sizes, with hanger rods sized accordingly for total supported weight.
- B. Copper pipe shall be supported at a maximum length of 6 feet for pipe sizes up through 1-1/2" and at a maximum length of 10 feet for pipe sizes 2" and larger with hanger rods sized accordingly for the total supported weight.
- C. PVC and CPVC pipe shall be supported at a maximum span of 3 feet for pipe sizes up through 1" and at a maximum span of 4 feet for pipe sizes 1-1/4" and larger with hanger rods sized accordingly for total supported weight.
- D. PEX tubing and Polyethylene pipe shall be supported at a maximum span of 32" with hanger rods sized accordingly for the total supported weight.
- E. Cast Iron soil pipe shall be supported with one hanger for each section of pipe (maximum 10' span) with hanger rods sized accordingly for the total supported weight. Locate hangers within 18" of hub or joint.
- F. In addition to the above specified spacings, install additional hangers at change in pipe direction and at concentrated loads, large valves, strainers, etc.
- G. When two or more pipes are to be run parallel together and are not exposed, they may be supported on trapeze type hangers. Trapeze bar angles or channels and hanger rods shall be of sufficient size with required spacing to support the particular group of pipes.
- H. For suspending hanger rods from brackets attached to walls; use welded steel brackets, Fig 194 for loads up to 750 lbs; Fig. 195 for loads up to 1,500 lbs; Fig. 199 for loads up to 3000 lbs.
- I. Where pipes are to be racked along walls, use malleable iron one hole clamp, Fig. 126 for pipes up to 3". For pipes larger than 3", use steel channel strut pipe rack.
- J. Where pipes are to be supported from floor, use unistrut pipe stand with post base. Unformed concrete will not be permitted.
- K. Hangers and supports for insulated cold piping shall not injure or pierce insulation. Provide insulation protection shields or saddles for piping, (Fig. 167) in conjunction with hanger or roll device

3.02 INSTALLATION VERTICAL PIPE SUPPORTS

- A. Support vertical steel and copper pipe at every other floor line.
- B. Support vertical cast iron soil pipe at every floor line.
- C. In addition to the above, support vertical pipes at base of riser with base fitting set on concrete or block pier, or by hanger located on horizontal connection close to riser.
- D. Where pipe sleeves extend above floor, place pipe clamps at ceiling below and support clamp extensions from inserts or other approved attachment.

3.03 PIPE ATTACHMENTS

- A. For horizontal steel pipe, use adjustable carbon steel clevis, Fig. 260, for pipes up to 30".
- B. For horizontal copper pipe and tube, use copper plated adjustable carbon steel clevis, Fig. CT 65.
- C. When thermal expansion for horizontal pipe is in excess of 1/2" axially as indicated on the drawing, use adjustable steel yoke pipe roll, Fig. 181, or pipe roll stand, Fig. 177.

3.04 INTERMEDIATE ATTACHMENTS

- A. Hanger rods: use carbon steel single or double end threaded, Figs. 140 and 253 as required. Continuous threaded rod, Fig. 146, may be used wherever possible. Contractor may at his option cut and thread rod on the job site.
- B. Chain, wire or perforated strap hangers will not be permitted. One pipe shall not be suspended from another pipe.
- C. Hangers shall be supported from appropriate structural members. In no case shall hangers be supported from ductwork, cable trays, piping, or other equipment. Existing hangers and supports shall not be used as supports for new hangers unless specifically designed as such, or additional loadings have been confirmed to be acceptable for existing supports.

3.05 STRUCTURAL ATTACHMENTS

- A. For attaching steel or copper plated hanger rods to reinforced concrete; use black carbon steel concrete inserts, Fig. 285 for loads up to 400 lbs., Fig. 281 for loads up to 1200 lbs. or suitable drilled inserts equal to Ramset/Red Head - Trubolt wedge anchor, Ramset/Red Head Epcon system or Hilti Kwik Bolt II anchor.
- B. For attaching steel hanger rods to structural steel beams, use malleable iron C clamps, Fig. 87, with retaining clip for loads up to 500 lbs.; Fig. 229 with extension piece for loads up to 1,365 lbs. For copper plated hanger rods, use copper plated malleable iron C clamps, Fig. CT 88, with hardened cup point set screw, for loads up to 400 lbs.
- C. For attaching steel hanger rods to wood structural members, use malleable iron ceiling flange pipe threaded, Fig. 128 for loads up to 480 lbs., Fig. 153 for loads up to 1270 lbs. For copper plated hanger rods, use copper plated malleable iron ceiling flange, Fig. CT 128R for loads up to 180 lbs.
- D. Under no circumstances shall hangers be attached to metal roof deck.

3.06 PIPE COVERING PROTECTION

- A. Hangers and supports for insulated cold piping and ductwork shall not injure or pierce insulation. Provide insulation protection shields or saddles for piping, Fig. 160, 161, 162, 163, 164, 165, 165A, 166A, or 167 in conjunction with hanger or roll device.

END OF SECTION 22 05 29

SECTION 22 05 53
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Identification shall be provided on all non-concealed plumbing piping and equipment as indicated by this section, on drawings and/or specified in other Division 22 sections.
- B. Type of identification devices specified in this section include the following:
 - 1. Painted identification materials
 - 2. Plastic pipe markers
 - 3. Plastic tape
 - 4. Valve tags
- C. Identification furnished as part of factory fabricated equipment, is specified as part of the equipment assembly in other Division 22 sections.

1.03 QUALITY ASSURANCE

- A. ANSI Standards: Comply with ANSI A13.1 for lettering size, colors, and viewing angles of identification devices.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Pipe marker material, color, and nomenclature.
 - 2. Valve tag material, color, and nomenclature.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Schedules: Submit valve schedule for each piping system, formatted in an Excel spreadsheet with a digital copy provided to the Owner along with a printed copy on 8 1/2" x 11" paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves which are intended for emergency shut off and similar special uses, by special "flags", in margin of schedule. In addition, furnish extra copies for Maintenance Manuals.

PART 2 - PRODUCTS

2.01 IDENTIFICATION MATERIALS

- A. General: Provide manufacturer's standard products of categories and types required for each application as referenced in other Division 22 sections. Where more than one single type is specified for an application, selection is Installer's option, but provide single selection for each product category.
- B. Painted Identification Materials:
 - 1. Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with recommendations of ANSI A13.1 for piping and similar applications, but not less than 3/4" high letters for access door signs and similar operational instructions.
 - 2. Stencil Paint: Standard exterior type stenciling enamel; black, except as otherwise indicated; either brushing grade or pressurized spray can form and grade.

3. Identification Paint: Standard identification enamel of colors indicated, or, if not otherwise indicated for piping systems, comply with color chart below for colors.
- C. Plastic Pipe Markers:
1. General: Provide manufacturer's standard pre-printed flexible or semi rigid, permanent, color coded, plastic sheet pipe markers.
 2. Color: Color of pipe markers shall comply with ANSI A13.1.
 3. Small Pipes: For external diameters not greater than 6" (including insulation if any), provide full band pipe markers extending 360 degrees around pipe at each location, fastened by one of the following methods:
 - a. Snap on application of pre tensioned semi rigid plastic pipe marker.
 - b. Adhesive lap joint in pipe marker overlap.
 - c. Laminated or bonded application of pipe marker to pipe (or insulation).
 - d. Taped to pipe (or insulation) with color coded plastic adhesive tape, not less than 3/4" wide full circle at both ends of pipe marker, tape lapped 1 1/2".
 4. Large Pipes: For external diameters of 6" and larger (including insulation if any), provide either full band or narrow strip type pipe markers, but not narrower than 3 times letter height (and of required length), fastened by one of the following methods:
 - a. Laminated or bonded application of pipe marker to pipe (or insulation).
 - b. Taped to pipe (or insulation) with color coded plastic adhesive tape, not less than 1 1/2" wide; full circle at both ends of pipe marker, tape lapped 3".
 - c. Strapped to pipe (or insulation) application of semi rigid type, with manufacturer's standard stainless-steel bands.
 5. Lettering: Manufacturer's standard preprinted nomenclature which best describes piping system in each instance, as selected by Design Professional in cases of variance with names as shown or specified.
 6. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as a separate unit of plastic.
- D. Plastic Tape:
1. General: Manufacturer's standard color-coded pressure sensitive (self-adhesive) vinyl tape, not less than 3 mils thick.
 - a. Width: Provide 1 1/2" wide tape markers on pipes with outside diameters (including insulation, if any) of less than 6", 2 1/2" wide tape for larger pipes.
 - b. Color: Comply with color selection indicated for Plastic Pipe Markers.
- E. Valve Tags:
1. Brass Valve Tags: Provide polished brass valve tags with stamp engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 7/16" high, and with 3/16" hole for fastener. Tag thickness 0.040 inches.
 - a. Provide 2" diameter tags, except as otherwise indicated.
 - b. Fill tag engraving with black enamel.
 2. Plastic Valve Tags: Provide red heavy plastic tag with 7/16" white embossed sequenced numbers.
 3. Valve Tag Fasteners: Manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S hooks or heat sealed braided copper wire of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.
- F. Name Plates:
1. General: Provide manufacturer's standard preprinted plastic, brass, or aluminum with stamped, engraved or embossed letters.
 2. Lettering:
 - a. Large Equipment: 1 1/2" lettering as appropriate.
 - b. Small Equipment: 3/4" lettering as appropriate.
 3. Attachments: Mounting holes and screws, pressure sensitive adhesive backing, or solid brass chain.

2.02 LETTERING AND GRAPHICS

- A. General: Coordinate names, abbreviations and other designations used in plumbing identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of plumbing systems and equipment.
 - 1. Multiple Systems: Where multiple systems of same generic name are shown and specified, provide identification which indicates individual system number as well as service (as examples; Boiler No. 3, Air Supply No. 1H, Standpipe F12).

PART 3 - EXECUTION

3.01 APPLICATION AND INSTALLATION

- A. General Installation Requirements:
 - 1. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish including valve tags, install identification after completion of covering and painting if any. Install identification prior to installation of acoustical ceilings and similar concealment.
- B. Piping System Identification:
 - 1. General: Install pipe markers of one of the following types on each piping system, and include arrows to show normal direction of flow:
 - a. Stenciled markers, including color coded background band or rectangle, and contrasting lettering of black or white. Extend color band or rectangle 2" beyond ends of lettering.
 - b. Plastic pipe markers, with application system as indicated under "Materials" in this section.
 - c. Stenciled markers, black or white for best contrast, wherever continuous color coded painting of piping is provided.
 - 2. Locate pipe markers, color bands, and flow direction arrows at all installations of piping, including all exposed piping, piping above all ceilings (both accessible and inaccessible ceilings), and within view of any points of access (access doors, manholes, etc.). The only locations where pipe labels are not required are on piping concealed behind or within any inaccessible walls and within inaccessible chases or shafts. When installing markers, bands, and arrows, they shall be installed to meet the following provisions:
 - a. Visible from the floor.
 - b. Near each valve.
 - c. Near each branch, excluding short take offs for fixtures and equipment; mark each pipe at branch, where there could be question of flow pattern.
 - d. Near locations where pipes pass through walls or floors/ceilings, or enter non accessible enclosures.
 - e. Near major equipment items and other points of origination and termination.
 - f. Spaced intermediately at maximum spacing of 20' along each piping run with a minimum of one marker in each room and on both sides of walls the pipe penetrates
- C. Valve Identification:
 - 1. General: Provide valve tag on every valve, cock and control device in each piping system; exclude check valves, valves within factory fabricated equipment units, valves that are 3/4" and adjacent to equipment served, plumbing fixture faucets, convenience and lawn watering hose bibs, and shut off valves at plumbing fixtures and similar rough in connections of end use fixtures and units. List each tagged valve in valve schedule and project number for each piping system.
- D. Equipment Identification:
 - 1. General: Provide equipment identification for all equipment including water heaters, heat exchangers, water softeners, and pumps.
 - 2. Labeling: All equipment shall be labeled as per construction document plan marks or as designated by Owner.

3. Provide identification by means of nameplates or stenciled painting as appropriate.
 - a. For equipment with factory furnished casing, identification shall be by adhesive fixed name plates.
 - b. Field insulated items, such as heat exchangers may be identified by plastic pipe markers or stenciled lettering.

END OF SECTION 22 05 53

SECTION 22 07 00
PLUMBING INSULATION

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this Section.

1.02 DESCRIPTION OF WORK

- A. Provide material, equipment, labor and supervision necessary to install insulation to all hot and cold surfaces of piping, tanks, fittings and other surfaces as required by the drawings and this section.
- B. Insulation shall include insulating materials, jackets, adhesive, mastic coatings, tie wire and other materials as required to complete the insulating work.

1.03 QUALITY ASSURANCE

- A. NFPA Compliance: Insulating materials, jackets, mastics, etc., shall meet flame spread and smoke developed ratings in accordance with NFPA-90A. Flame spread rating of not more than 25, smoke developed rating of not more than 50 as tested by ANSI/ASTM E84 (UL 723) (NFPA 255) method. All accessory items such as PVC jacketing and fittings, adhesive, mastic, cement tape and cloth shall have the same component ratings as specified above.
- B. Installation of insulation materials shall be in accordance to ASHRAE 90.1 and the latest edition of MICA/NIAC National Commercial & Industrial Standards for the appropriate material application.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's catalog cut sheets and schedules for each type of plumbing insulation. Submit schedule showing manufacturer's product number, thickness, and furnished accessories for each plumbing system requiring insulation.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver insulation, coverings, cements, adhesives, and coatings to site in containers with manufacturer's stamp or label, affixed showing fire hazard ratings of products.
- B. Protect insulation against dirt, water, and chemical and plumbing damage. Do not install damaged insulation; remove from project site.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Insulating Materials
 - 1. Owens/Corning Fiberglass Corp.
 - 2. Armacell
 - 3. Pittsburgh Corning Corp.
 - 4. CertainTeed Corp.
 - 5. Knauf Fiber Glass

6. John's-Manville Corp.
7. Aeroflex

B. Mastics and adhesives as recommended by insulation manufacturer.

2.02 PIPE INSULATION

- A. Type 'A': Preformed sectional heavy density fiberglass insulation and factory applied vapor barrier, all service jacket with pressure sensitive self-sealing longitudinal laps and butt strips. Suitable for operating temperatures from 0 to +850 deg. F. Thermal conductivity shall be no more than 0.23 Btu-in/hr-sq.ft.-deg F @ 75 deg. F mean temperature. Water vapor permeance of .02 perms. Equal to Owens Corning 25 ASJ/SSL.
1. Where insulation is exposed to weather outdoors it shall be covered with an aluminum or stainless steel weatherproof jacket 0.016" thick and sealed.
 2. Where insulation is exposed in indoor occupied space and within 8 feet of finished floor, it shall be covered with 30 mil PVC jacket equal to Johns Manville Zeston.
- B. Type 'B': Flexible elastomeric extruded pipe covering, 6 pound density, 0.27 K factor, water vapor permeance of 0.20 perms. Suitable for temperature from -40 deg. F to +220 deg. F. Equal to Armacell, AP Armaflex, joints sealed with adhesive as recommended by insulation manufacturer.
1. Where insulation is exposed to weather outdoors it shall be covered with an aluminum or stainless steel weatherproof jacket 0.016" thick and sealed.
 2. Where insulation is exposed in indoor occupied space and within 8 feet of finished floor, it shall be covered with 30 mil PVC jacket equal to Johns Manville Zeston.

2.03 FITTING INSULATION

- A. Type 'A1': Fittings: Insulate with mitered segments of same insulating material as for adjacent pipe covering, or with pre-molded fiberglass wired in place and covered with all-service jacket or low smoke PVC fitting covers. Valve bodies, strainer bodies, flanges, etc.: insulate with single or multiple layers of same insulating material as for adjacent pipe covering, wired in place and covered with all-service jacket.
- B. Type 'B1': Fittings: Insulate fittings, valve bodies, strainer bodies, etc., with mitercut pipe insulation or sheet insulation of same material as pipe covering.

2.04 EQUIPMENT INSULATION

- A. Type 'G':
1. Rigid fiberglass insulation board with factory applied all service jacket. Suitable for operating temperatures of 0 to +850 deg. F. Water vapor permeance of .02 perms. Equal to Owens Corning Series 700 with 25 ASJ facing.
 2. Cut or miter insulation where necessary to fit the shape and contour of the equipment. On round surfaces band insulation in place with 3/4" x 0.015" thick galvanized steel bands 18" on center. On flat or irregular surfaces impale insulation over welded pins on 12" centers and secure with speed washers.
 3. Apply vapor seal ASJ pressure-sensitive patches at damaged areas. All insulation edges and butt joints are to be sealed with pressure-sensitive joint sealing tape to match the jacket. Apply in accordance with manufacturers recommendations.
- B. Type 'I':
1. Flexible elastomeric insulation. Suitable for operating temperatures of -40 to +220 deg. F. Equal to Armacell Armaflex II Sheet Insulation.
 2. Cut insulation where necessary to fit the shape and contour of the equipment. Insulation shall be installed using Armacell 520 Adhesive.
 3. Exposed outdoor insulation shall be finished with two coats of Armacell Armaflex finish.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Use only experienced applicators regularly engaged in the trade. Rough work will be rejected. Application details shall be in accordance with the insulating materials supplier's recommendations except where a higher standard is specified. All surface finishes shall be extended in such a manner as to protect all raw edges, cuts and surfaces of insulation.
- B. Do not insulate the following:
 - 1. Valve bonnets
 - 2. Unions in hot piping
 - 3. Preinsulated expansion joints
- C. Inspect all piping and equipment before applying insulation to ensure the installing contractor has completed all leak tests, and that all surfaces are clean, dry and ready for application of insulation. Colder than ambient systems shall not be put into operation until insulation and vapor barriers are complete.
- D. Covering for "cold" pipes shall pass unbroken through hanger clevises, sleeves, walls, floor penetrations, etc. All details of covering for cold surfaces shall be such that continuous covering with unbroken vapor barrier and uncompressed insulation is provided as required to prevent condensation. The same covering and hanging detail shall be used for pipes connecting to vibrating equipment or carrying pulsating pressures to avoid metal contact between pipes and hangers.
- E. Insulation at removable heads, strainer plugs, and other access points shall be fabricated in such a manner that it can be readily removed without damage to the insulation. Removable insulation shall have a vapor proof cover fabricated so as to allow it to be resealed to the equipment vapor barrier.
- F. Provide rigid insulation inserts at hangers for pipes sizes 2" and larger. Inserts shall be polyisocyanurate or calcium silicate, a minimum of 180 degrees and extend 2" beyond the hanger shield. Refer to MICA Plate 1-610. Wood or plastic block hanger inserts shall not be used.
- G. Use hydraulic insulating cement anywhere insulation fibers are exposed, to fill voids, and to repair damages to the factory applied vapor barrier. Finish with material matching or compatible with adjacent jacket material.

*****NOTE: Not all services may apply – refer to plans for scope of services.*****

3.02 INSULATION SCHEDULE

Service	Type Insulation and Thickness*
Above Ground Piping	
Domestic cold water lines (including all pipe material types)	Type A and A1: All pipe sizes – 1" thick Type B and B1: Pipe sizes 1-1/4" and smaller – 1/2" thick Pipe sizes 1-1/2" and larger – 1" thick
Domestic hot water, tempered water, and recirculating lines (including all pipe material types)	Type A/B and A1/B1: Pipe sizes 1-1/4" and smaller – 1" thick Pipe size 1-1/2" – 1-1/2" thick Pipe sizes 2" and larger – 2" thick

Service	Type Insulation and Thickness*
Above Ground Piping	
Storm piping, sump pump discharge lines. Sanitary vent piping within ten feet of roof penetration	Type A and A1: 1" thick for all pipe sizes Type B and B1: 1" thick for all pipe sizes
Underside of roof drain bodies	Type G: 1" thick Type I: 3/4" thick
* Insulation type and thickness indicated in table apply for all pipe materials. **For piping exposed to outdoor ambient temperatures, increase thickness by 1/2"	

END OF SECTION 22 07 00

SECTION 22 11 16
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all equipment, materials, tools, labor and supervision necessary to fabricate and install complete piping system as required by the drawings and this section.
 - 1. Extent of domestic water piping work is indicated on drawings and schedules, and by requirements of this section.
 - 2. Insulation of domestic water piping is specified in other Division 22 sections and is included as work of this section.
 - 3. Installation of valves for domestic water piping system is specified in other Division-22 sections and is included as work of this section.

1.03 QUALITY ASSURANCE

- A. ASME Compliance: Fabricate and install domestic water piping in accordance with ASME B31.9 "Building Services Piping".
- B. UPC Compliance: Fabricate and install domestic water piping in accordance with IAPMO "Uniform Plumbing Code".
- C. IPC Compliance: Fabricate and install domestic water piping in accordance with the "International Plumbing Code".
- D. Plumbing and Drainage Institute: Fabricate and install domestic water piping with Standard PDI-WH201.
- E. ANSI/NSF 372 Certification: All potable water supply piping, valves, fittings, and fixtures (excluding toilets, urinals, fill valves, flush valves, shower valves, and main gate valves greater than 2") shall meet the requirements for ANSI/NSF 372 Certification, Drinking Water System Components, Lead Content.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's material data and installation methods for each type of piping to be provided.
 - 2. Manufacturer's catalog cut sheets for each type of device to be used.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Startup and test reports.
 - 3. Manufacturer's Warranty: Submit manufacturers standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Water Hammer Arrestors
 - 1. Ancon
 - 2. Sioux Chief

3. Wade
 4. Watts
 5. Zurn
- B. Copper Pressure Seal Fittings
1. Viega Pro Press
 2. NIBCO Press System
- C. Commercial Expansion Tanks
1. Bell & Gossett
 2. Amtrol
 3. Spiro Therm
 4. Wessels

2.02 BASIC MATERIALS AND PRODUCTS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with Uniform Plumbing Code and International Plumbing Code where applicable, base pressure rating on domestic water piping system's maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in domestic water piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- B. Valves: Refer to Section 22 05 23 - General Duty Valves for Plumbing Piping.
- C. Piping Specialties: Refer to Section - 22 05 00 - Common Work Results for Plumbing.
- D. Expansion Compensation: Refer to Section 22 05 16 - Expansion Fittings and Loops for Plumbing Piping.
- E. Meters and Gauges: Refer to Section 22 05 19 - Meters and Gages for Plumbing Piping.
- F. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.

2.03 PIPE:

- A. Provide pipe materials meeting the following criteria and referenced standards:
1. Ductile Iron Pipe (D-Iron): Cement lined ductile iron, ANSI/AWWA C104/A21.4.
 2. Polyvinyl Chloride (PVC): DR18 ANSI/AWWA C900 or C905 with tracer wire.
 3. Type K Copper (K Cu): Type K copper water tube, hard temper, ASTM B88.
 4. Type L Copper (L Cu): Type L copper water tube, hard temper, ASTM B88.
 5. Brass (Brass): Schedule 40 Chromium plated, ASTM B43.
 6. Cross Linked Polyethylene (PEX): Cross-linked polyethylene PEXa (DIN 4726) , ASTM F876, ASTM F877, ASTM F1960.
 7. Stainless Steel (St St): Type 304 schedule 10, ASTM A 312/ A 312M.
- B. Unless specifically prohibited by local codes, provide piping materials for systems indicated according to the following table:

Service	Material						
	D-Iron	PVC	K Cu	L Cu	Brass	PEX	St St
Water service pipes 2" and smaller		X	X				
Above ground domestic water				X		X	X
Exposed fixture connections					X		

2.04 FITTINGS:

- A. Cast iron water pipe: Class 250 ANSI A21.20, AWWA C110-71, standard mechanical joint fittings.

- B. Copper water tube cast bronze or wrought copper:
 - 1. Solder joint type. ASME B16.18 and B16.22-63. Where copper piping is used for combined water/fire protection water service, joints upstream of fire protection backflow preventer shall be brazed.
 - 2. Pressure Seal pipe joining system, copper press fittings, 1/2" to 4" in diameter. ASME B16.18, ASME B16.22. O-rings for copper press fittings shall be EPDM. Installation per manufacturer's recommendations.
- C. Brass pipe: Cast bronze screwed, 125-pound, flat band water pattern, chromium plated, for chromium plated pipe.
- D. Stainless Steel pipe:
 - 1. Grooved-end (roll grooved only): ASTM A 815/A 815M. Stainless steel casting with dimensions matching stainless steel pipe.
 - 2. Pressure Seal piping joining system, Type 304 stainless steel, ASTM A312 Schedule 10S, with EPDM gasket UL Classified in accordance with ANSI/NSF 61.
- E. Cross-Linked Polyethylene (PEX) (domestic water): ASTM F1960 utilizing expander fittings. ASTM F1960 brass fittings ANSI/NSF 14 and 61 certified.

2.05 JOINTS

- A. Copper water tube:
 - 1. Use non-corrosive 95-5 tin-antimony solder, cut pipe square, clean, ream and polish tube ends and inner surfaces of fittings, apply flux and solder joint as recommended by manufacturer of solder type fittings. Where copper piping is used for combined water/fire protection water service, joints upstream of fire protection backflow preventer shall be brazed.
 - 2. Pressure Seal pipe joining system, copper press fittings, 1/2" to 4" in diameter. ASME B16.18, ASME B16.22. O-rings for copper press fittings shall be EPDM.
- B. Stainless Steel pipe:
 - 1. Grooved-end (roll grooved only): AWWA C606 for stainless steel pipe dimensions, stainless steel housing, bolts, and nuts, EPDM rubber gaskets suitable for hot and cold water.
 - 2. Pressure Seal piping joining system, Type 304 stainless steel, ASTM A312 Schedule 10S, with EPDM gasket UL Classified in accordance with ANSI/NSF 61.
- C. Cross-Linked Polyethylene (PEX) (domestic water): ASTM F1960 utilizing expander fittings. ASTM F1960 brass fittings ANSI/NSF 14 and 61 certified.

2.06 NIPPLES AND UNIONS

- A. All nipples shall conform to size, weight and strength of adjoining pipe. When length of unthreaded portion of nipple is less than 1-1/2", use extra strong nipple; do not use close nipples.
- B. For pipe 2" and smaller, use screwed unions, for pipe 2-1/2" and over use flanged unions connections.
- C. Install unions in the following locations so that a minimum amount of pipe need be disassembled:
 - 1. Long runs, at intervals of 80 feet.
 - 2. In by-pass around equipment, valves, and controls.
 - 3. In connections to equipment.
 - 4. Where indicated on drawings.
- D. Dielectric unions shall be installed between any connection of copper pipe and ferrous piping or equipment. In grooved piping systems, provide Clearflo by Victaulic.

2.07 AIR VENTS

- A. Manual Air Vents: Bell & Gossett Model No. 17SR.
- B. Automatic Air Vents: Bell & Gossett Model No. 7

2.08 WATER HAMMER ARRESTORS

- A. Water hammer arrestors shall be piston type with seamless copper chamber, two O-ring piston and a 60 psi charge. Water hammer arrestors shall be sized, tested and certified in accordance with the Plumbing and Drainage Institute Standard PDI-WH201 and American Society of Sanitary Engineering Standard ASSE-1010.

2.09 EXPANSION TANKS

- A. Furnish and install pre-charged steel expansion tanks as indicated on plans. Tanks shall have integral heavy-duty Butyl rubber diaphragm, NPT system connection(s), and a .302" - 32 charging valve connection (standard tire valve) to facilitate the on-site charging of the tank to meet system requirements. The tank shall be suitable for potable water and be constructed in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code and stamped 125 PSI working pressure.

PART 3 - EXECUTION

3.01 INSPECTION

- A. General: Examine areas and conditions under which domestic water piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION OF BASIC MATERIALS AND PRODUCTS

- A. General: Install basic materials and products as per manufacturers' recommendations, Uniform and International Plumbing Codes, local code requirements and as required to meet system pressure and performance requirements.
- B. Piping Protection: Protect piping from damage during construction, including, but not limited to covering pipes during application of spray on fire-proofing to prevent fire proofing material from coming in contact with the pipes.
- C. Valves
 - 1. Refer to Section 22 05 23 - General Duty Valves for Plumbing Piping.
 - 2. Locate valves for easy access and operation. Do not locate valves with stems below horizontal.
 - 3. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves 2 or more plumbing fixtures and elsewhere as indicated.
 - 4. Shutoff Valves: Install on inlet and outlet of each domestic water equipment item and elsewhere as indicated.
 - 5. Check Valves: Install on discharge side of each pump, and elsewhere as indicated.
- D. Piping Specialties: Refer to Section 22 05 00 - Common Work Results for Plumbing.
- E. Expansion Compensation Products: Refer to Section 22 05 16 - Expansion Fittings and Loops for Plumbing Piping.
- F. Meters and Gauges: Refer to Section 22 05 19 - Meters and Gages for Plumbing Piping.
- G. Supports and Anchors: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

3.03 DOMESTIC WATER PIPING

- A. Install pipe for all domestic water and domestic water systems as indicated on drawings, as called for in other sections, and as specified herein.
- B. Arrange and install piping approximately as indicated; straight, plumb, and as direct as possible; form right angles on parallel lines with building walls. Keep pipes close to walls and avoid interference with other trades. Locate groups of pipes parallel to each other; space at a distance to permit applying full insulation and to permit access for servicing valves. Most piping to be run in concealed locations unless indicated exposed, or in equipment rooms. Locate piping to avoid ductwork.

- C. Install horizontal piping as high as possible without sags or humps so that proper grades can be maintained for drainage.
- D. Check all piping for interference with other trades; avoid placing water pipes over electrical equipment.
- E. Where rough-in is required for equipment furnished by others, verify exact rough-in dimension with owner or equipment supplier before roughing-in.
- F. Extend cold water and hot water piping to each fixture and other equipment requiring water supplies.
- G. Pitch pipes to accessible drainage point where unions, plugged tees or drainage valves shall be provided.
- H. Branch take off pipe connections shall come off the top of mains.
- I. Pipes built into masonry or concrete construction shall be wrapped with tar paper or burlap to prevent bonding to the concrete.
- J. No pipe shall be located in an outside wall or other location where freezing is likely to occur.
- K. No pipe shall be in contact with, or attached to, a structural member in a manner that causes the transmission of noise to the structure. Block ends of runs to prevent movement due to water hammer.

3.04 EQUIPMENT CONNECTIONS

- A. Refer to Section 22 11 23 - Domestic Water Pumps and 22 34 00 - Fuel Fired Domestic Water Heaters.
- B. General: Connect domestic water piping system to plumbing equipment as indicated and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and union on supply and return, drain valve on drain connection.

3.05 INSTALLATION OF FIXTURES

- A. Refer to Section 22 40 00 - Plumbing Fixtures.
- B. General: Connect water piping system to plumbing fixtures as indicated and comply with manufacturer's instructions where not otherwise indicated.
- C. Refer Water supply to all fixtures and containers shall be so installed as to prevent back siphonage of polluted water into the water supply. All supplies shall be either above the flood rim of the fixture or separated from the drainage end by means of approved vacuum breakers

3.06 INSTALLATION OF WATER HAMMER ARRESTORS

- A. Install water hammer arrestors as indicated on the drawings and as required per Plumbing and Drainage Institute Standard PDI-WH201. Water hammer arrestors to be installed in accessible locations where possible.

3.07 INSTALLATION OF PLUMBING SPECIALTIES

- A. General: Install plumbing specialties and valves as per manufacturer's installation instructions.
- B. Provide unions, valves to units at each connection as required by inspection.

3.08 HYDROSTATIC TESTING

- A. General: New water mains shall be subject to hydrostatic testing in accordance with AWWA C600 and other applicable AWWA Standards of latest revision and the following supplemental instructions.
- B. Supplemental Instructions:
 - 1. All newly laid pipe or any valved section thereof shall be subject to a hydrostatic pressure of 1.5 X the working pressure at the point of testing or 100 psig, whichever is greater.
 - 2. The test procedures shall:
 - a. Not exceed pipe or thrust restraint design pressures.
 - b. Be of at least 4-hour duration.
 - c. Not exceed the rated pressure of the valves or hydrants.

3. Each valved section of pipe shall be filled with water slowly and the specified test pressure shall be applied by means of a pump connected to the pipe.
4. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants.
5. Any damaged or defective pipe, fittings, valves or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated.
6. A leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain test pressure.
7. No pipe installation will be accepted where leakage is observed.

3.09 TESTS AND DEMONSTRATIONS

- A. Tests Required: Piping shall be tested and proved tight under the following static pressures. Pressure shall be maintained for four (4) hours.

<u>System</u>	<u>Pressure</u>
Domestic Water Piping Systems	Refer to Section 22 11 16 – Domestic Water Piping: Hydrostatic Testing

- B. All systems shall be tested by Contractor and placed in proper working order prior to demonstrating systems to Owner. Provide notification seven days prior to testing. Contractor shall submit a report to Design Professional citing dates, times, pressures, and results of all tests performed.

3.10 DISINFECTION

- A. General: Upon completion of a newly installed piping or when repairs to an existing pipe are made, the piping shall be disinfected according to instructions listed in AWWA C651, local codes, local utility requirements, and the following supplemental instructions.
- B. Repairs: Repairs to mains and plumbing shall be disinfected by swabbing with hypochlorite and flushing in accordance with AWWA C651.

END OF SECTION 22 11 16

SECTION 22 11 23
DOMESTIC WATER PUMPS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of plumbing pumps work required by this section is indicated on drawings and schedules, and by requirements of this section.
- B. Types of pumps specified in this section include the following:
 - 1. In-line Circulators
- C. Refer to Division-26 sections for the following work; not work of this section:
 - 1. Power supply wiring from power source to power connection on pumps. Include starters, disconnects and required electrical devices, except where specified as furnished, or factory installed, by manufacturer.

1.03 QUALITY ASSURANCE

- A. UL Compliance: Design, manufacturer and install pumps in accordance with UL 778 "Motor Operated Water Pumps".
- B. UL and NEMA Compliance: Provide electric motors and components which are listed and labeled by Underwriters Laboratories and comply with NEMA standards.
- C. ANSI/NSF 372 Certification: Domestic Water Pumps shall meet the requirements of ANSI/NSF 372 Certification, Drinking Water System Components, Lead Content.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data: provide one submittal containing the following information:
 - 1. Manufacturer's pump specifications, installation and start-up instructions, and current accurate pump characteristic performance curves with selection points clearly indicated.
 - 2. Drawings: Submit manufacturer's assembly type drawings indicating dimensions, weight loadings, required clearances and method of assembly of components.
 - 3. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to pumps. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - c. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handle pumps and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged pumps or components; replace with new.
- B. Store pumps and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris and physical damage.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. In-Line Circulators and Pumps
 - 1. Armstrong Pumps, Inc.
 - 2. Aurora
 - 3. Bell & Gossett ITT; Fluid Handling Div.
 - 4. Grundfos
 - 5. Taco, Inc.
- B. General: Provide factory tested pumps, thoroughly cleaned and painted with one coat of machinery enamel prior to shipment. Type, size and capacity of each pump is listed in pump schedule. Provide pumps of same type by same manufacturer.

2.02 IN-LINE CIRCULATORS

- A. General: Provide in-line circulator pumps where indicated, and of capacities as scheduled. In-line circulators shall be of either all bronze or stainless-steel construction.
- B. Type: Horizontal mount, permanently lubricated, designed for 150 psi working pressure and 225 deg. F continuous water temperature.
- C. Construction: Cast bronze or stainless-steel body with suction and discharge flanges. Steel shaft mounted on permanently lubricated, sealed ball-bearings. Water-tight seal fill mechanical carbon on silicon carbide face seals.
- D. Impeller: Composite construction, enclosed type, hydraulically and dynamically balanced, and keyed to shaft.
- E. Motor: Non-overloading at any point on pump curve, drip-proof, permanently sealed ball bearings, resilient mounted construction, permanent split capacitor with thermal overload protection, single phase motors.
- F. Controls: Provide circulator with integral time clock.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine areas and conditions under which pumps are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable with Installer.

3.02 INSTALLATION OF PUMPS

- A. General: Install plumbing pumps where indicated, in accordance with manufacturer's published installation instructions, complying with recognized industry practices to ensure that pumps comply with requirements and serve intended purposes.
- B. Access: Provide access space around pumps for service as indicated, but in no case less than that recommended by manufacturer.
- C. Support: Install in-line pumps, supported from piping system.
- D. Controls: Install devices furnished by manufacturer but not specified to be factory mounted. Furnish copy of manufacturer's wiring diagram submittal to Electrical Installer for power wiring.
 - 1. Verify that wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-26 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.
- E. Piping Connections: Refer to Division-22 Plumbing piping sections. Provide piping, valves, accessories, gauges and supports as indicated, including the following:
 - 1. Strainer and shut-off valve in suction line.
 - 2. Check valve, balancing/shut-off valve in discharge line. At contractor's option, an indicating type butterfly valve may be used in lieu of balancing cock and shut-off valve.
 - 3. Compound gauge with turn cocks connected between pump suction and discharge.

3.03 ADJUSTING AND CLEANING

- A. Alignment: Check alignment, and where necessary, realign shafts of motors and pumps within recommended tolerances by manufacturer, and in presence of manufacturer's service representative.
- B. Start-up: Lubricate pumps before start-up. Start-up in accordance with manufacturer's instructions.
- C. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

3.04 TRAINING AND DEMONSTRATIONS

- A. Equipment training:
 - 1. Manufacturer's representatives and contractor shall provide 2 hours (min) instruction on each pump and related components.
 - 2. Training sessions shall use the printed installation, operation and maintenance instruction materials included in the O&M manuals and emphasize preventative maintenance and safe operating procedures.
 - 3. Training shall be performed by qualified factory trained technicians.
 - 4. Plumbing Contractor shall attend all sessions performed by the manufacturer's representative and shall add to each session any special information relating to the details of installation of the equipment as it might impact the operation and maintenance.
 - 5. Equipment training shall occur as soon as possible after start up of the equipment and shall include hands-on operation.

END OF SECTION 22 11 23

SECTION 22 13 16
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all equipment, materials, tools, labor and supervision necessary to fabricate and install complete piping system as required by the drawings and this section.
 - 1. Extent of sanitary waste and vent piping work is indicated on drawings and schedules, and by requirements of this section.

1.03 QUALITY ASSURANCE

- A. UPC Compliance: Fabricate and install sanitary waste and vent piping in accordance with IAMPO "Uniform Plumbing Code".
- B. IPC Compliance: Fabricate and install sanitary waste and vent piping in accordance with the "International Plumbing Code".
- C. Plumbing and Drainage Institute: Fabricate and install domestic water piping with Standard PDI-WH201.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's catalog cut sheets including materials and components and construction materials and dimension drawings for each type of drain.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Startup and test reports.
 - 3. Manufacturer's Warranty: Submit manufacturers standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Floor Drains and Floor Sinks
 - 1. Jay R. Smith
 - 2. Jonespec
 - 3. Josam
 - 4. Wade
 - 5. Watts
 - 6. Zurn
 - 7. Mifab

2.02 BASIC MATERIALS AND PRODUCTS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with International and Uniform Plumbing Codes. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in sanitary waste and vent piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- B. Piping Specialties: Refer to Section - 22 05 00 - Common Work Results for Plumbing.
- C. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.

2.03 PIPE:

- A. Provide pipe materials meeting the following criteria and referenced standards:
 - 1. Cast Iron Soil Pipe (C-Iron): Service class, bell and spigot, asphalt coated, ASTM A74.
 - 2. No-Hub Cast Iron Soil Pipe (C-Iron NH): Service class, no hub, asphalt coated, CISPI 301 or ASTM A-888.
 - 3. Polyvinyl Chloride (PVC): Schedule 40, DWV, ASTM D1785 and ASTM D2665.
 - 4. DWV Copper (DWV Cu): Drainage Waste and Vent copper pipe , ASTM B306.
 - 5. Brass (Brass): 17 gauge brass tube, chromium plated, ASTM B43.
- B. Unless specifically prohibited by local codes, provide piping materials for systems indicated according to the following table:

Service	Material							
	C-Iron	C-Iron NH	PVC	DWV Cu	Brass	FR PP	PP	CPVC
Sanitary waste and vent above slab, up to and including 2-1/2"		X	X	X				
Sanitary waste and vent above slab, 3" and larger	X	X	X	X				
Condensate Drain Line – condensing heater			X					
Exposed fixture connections					X			

2.04 FITTINGS:

- A. Material and strength of fittings for sewer pipe, conform to pipe as per ASTM Standards.
- B. PVC DWV pipe fittings: ASTM D2665 DWV Schedule 40 socket type. Provide fittings produced and recommended for the service indicated by manufacturer of tubing. Solvent cements as per ASTM 2564.
- C. Copper drainage tube: Cast bronze fittings, solder joint fittings. ANSI B16.23.
- D. Brass pipe: Cast bronze screwed, 125 pound, flat band water pattern, chromium plated, for chromium plated pipe.

2.05 JOINTS

- A. Cast iron bell and spigot soil pipe: Pack joints with oakum, fill with molten lead at one pouring, caulk solid flush with hub rim. If approved by Code, pre-set plastic or neoprene joint may be used, ASTM C 564.
- B. Cast iron no-hub pipe: Coupling assembly tightened by torque wrench, CISPI 310, ASTM C 564.
- C. PVC pipe fittings (below grade sanitary sewer): Listed compression type joints.
- D. PVC DWV pipe: Solvent cement in accordance with ASTM D2564.

- E. Copper drainage tube: Use non-corrosive 50-50 solder, cut pipe square, clean, ream and polish tube ends and inner surface of fittings, apply flux and solder joint as recommended by manufacturer of solder type fittings. Use same method for copper refrigerant pipe, except use silver solder with 5% silver content, or equal strength brazing alloy.

2.06 VENTS

- A. Vents through the roof shall be cast iron long increasers beginning at 12" under the roof and extending at least above the highest possible water level on the roof but in no case less than 12". Size increases as follows:

<u>Vent Size</u>	<u>Increase To</u>
1-1/4" and 1-1/2"	3" minimum
2" and 2-1/2"	4" minimum
3"	4"
4"	6"

- B. Provide and install flashing for each vent through the roof. The flashing shall extend up around the pipe and be sealed to the pipe and shall extend over the roof deck at least one foot in each direction from the base.

2.07 FLOOR DRAINS AND FLOOR SINKS

- A. Shall be of the style as called for in fixture schedule.
B. Drains without integral traps shall have service class p-traps.

2.08 CLEANOUTS

- A. In floors of finished areas: cast iron caulking ferrule for soil pipe hub with brass countersunk plug and cast brass round flush access cover with polished top.
B. In floors of unfinished areas: cast iron with tapered body for caulking into soil pipe hub, with brass countersunk plug.
C. In walls of finished areas: cast brass raised head plug and round stainless steel cover plate with polished top and countersunk cover screw. Provide with caulking ferrule where installed in cast iron soil pipe.
D. In walls of unfinished areas: cast brass raised head, iron pipe size male threads. Provide with caulking ferrule where installed in iron soil pipe.
E. In floors of areas subject to vehicular travel: cast iron with tapered body for caulking into soil pipe hub, with brass countersunk plug. Weight rated for fork truck and heavy traffic duty.

PART 3 - EXECUTION

3.01 INSPECTION

- A. General: Examine areas and conditions under which sanitary waste and vent piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION OF BASIC MATERIALS AND PRODUCTS

- A. General: Install basic materials and products as required per manufacturer=s recommendations, International and Uniform Plumbing Codes, local code requirements and as required to meet the intent of the documents.
B. No soil or waste pipe shall be covered by earth or construction without first being proved free of leaks by a hydrostatic test of at least 10 feet head.
C. Install vents in practical alignment and supported with constant pitch back to the drainage system, concealed from finished spaces, unless shown or directed otherwise.
D. Soil, waste and vent connections to fixtures shall be accurately located and concealed from finished spaces, unless indicated otherwise.

- E. Connections to horizontal branches shall be at 45 deg. angle using Wye or Tee-Wye. Connection to vertical stacks shall be with Sanitary Wye or Tee-Wye at 45 deg.

3.03 SANITARY WASTE AND VENT PIPING

- A. Install pipe for all sanitary waste and vent systems as indicated on drawings, as called for in other sections, and as specified herein.
- B. Arrange and install piping approximately as indicated; straight, plumb, and as direct as possible; form right angles on parallel lines with building walls. Keep pipes close to walls and avoid interference with other trades. Locate groups of pipes parallel to each other; space at a distance to permit applying full insulation and to permit access for servicing valves. Most piping to be run in concealed locations unless indicated exposed, or in equipment rooms. Locate piping to avoid ductwork.
- C. Provide proper support to maintain uniform fall of 1/4" per foot for lines 3" and smaller and 1/8" per foot for lines 4" and larger. Protect all openings against the entrance of dirt. Where piping must cross footings, the piping shall cross under footings unless noted otherwise on the drawings.
- D. Check all piping for interference with other trades, avoid placing water pipes over electrical equipment.
- E. Where rough-in is required for equipment furnished by others, verify exact rough-in dimension with owner or equipment supplier before roughing-in.
- F. Piping Specialties: Refer to Section 22 0500 - Common Work Results for Plumbing.
- G. Supports, Anchors and Seals: Refer to Section 22 0529 - Hangers and Supports for Plumbing Piping.
- H. Equipment Connections
 - 1. General: Connect sanitary waste and vent piping system to plumbing equipment as indicated, and comply with equipment manufacturer's instructions where not otherwise indicated. Install shutoff valve and union on supply and return, drain valve on drain connection.
- I. Field Quality Control
 - 1. Piping Tests: Test sanitary waste and vent piping in accordance with testing requirements of Division 22 Basic Materials and Methods, Section 22 00 10 - Plumbing General Provisions.
- J. Underground installation of thermoplastic pipe shall be done in accordance with ASTM D 2321.

3.04 INSTALLATION OF CLEANOUTS

- A. Provide a cleanout at the base of each stack where the sewer leaves the building and at other points where required by code and good practice. Cleanout spacing shall not exceed 50'-0" on long runs. Cleanouts shall be the same size as pipe up to and including 6" and 6" for 6" or larger pipes. Cleanouts for concealed pipes shall be set flush with floor and wall surfaces.

3.05 INSTALLATION OF FLOOR DRAINS AND FLOOR SINKS

- A. Obtain exact finished floor levels from the General Contractor and set floor drain top rims accurately to proper level below finished floor to allow for proper slope towards drains.
- B. Unless specifically noted otherwise on the plans, floor sink top rims shall be installed flush with the finish floor level.

3.06 INSTALLATION OF FIXTURES

- A. Refer to Section 22 40 00 - Plumbing Fixtures.

3.07 TESTS AND DEMONSTRATIONS

- A. Tests Required: Piping shall be tested and proved tight under the following static pressures. Pressure shall be maintained for four (4) hours.

<u>System</u>	<u>Pressure</u>
Sanitary Waste and Vent Piping Below Grade	10 feet waterhead or fill to top of vent outlet above roof.
Sanitary Waste and Vent Piping Above Grade	Fill piping with water to top of vent outlet above roof, or 10 feet waterhead.

TESTING NOTE: All rubber gasket joints for cast iron soil pipe and fittings should be properly restrained if test pressures exceed 10 feet of head.

- B. All systems shall be tested by Contractor and placed in proper working order prior to demonstrating systems to Owner. Provide notification seven days prior to testing. Contractor shall submit a report to Design Professional citing dates, times, pressures, and results of all tests performed.

END OF SECTION 22 13 16

SECTION 22 14 13
FACILITY STORM DRAINAGE PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all equipment, materials, tools, labor and supervision necessary to fabricate and install complete piping system as required by the drawings and this section.
 - 1. Extent of storm drainage piping work is indicated on drawings and schedules, and by requirements of this section.
 - 2. Insulation of storm drainage piping is specified in other Division 22 sections and is included as work of this section.

1.03 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's catalog cut sheets including materials and components and construction materials and dimension drawings for each type of site drain and roof drain.

1.04 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Startup and test reports.
 - 3. Manufacturer's Warranty: Submit manufacturers standard warranty document.

1.05 QUALITY ASSURANCE

- A. UPC Compliance: Fabricate and install storm drainage piping in accordance with IAMPO "Uniform Plumbing Code".
- B. IPC Compliance: Fabricate and install storm drainage piping in accordance with the "International Plumbing Code".

PART 2 - PRODUCTS

2.01 BASIC MATERIALS AND PRODUCTS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with International and Uniform Plumbing Codes. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in storm drainage piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- B. Piping Specialties: Refer to Section - 22 05 00 - Common Work Results for Plumbing.
- C. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.

2.02 PIPE:

- A. Provide pipe materials meeting the following criteria and referenced standards:
 - 1. Cast Iron Soil Pipe (C-Iron): Service class, bell and spigot, asphalt coated, ASTM A74.

2. Cast Iron Soil Pipe (C-Iron NH): Service class, no hub, asphalt coated CISPI 301 or ASTM A-888.
 3. Polyvinyl Chloride Pipe (PVC): Schedule 40, DWV, ASTM D1785 and ASTM D2665.
- B. Unless specifically prohibited by local codes, provide piping materials for systems indicated according to the following table:

Service	Material			
	C-Iron	C-Iron NH	PVC	PVC-ext
Above slab storm sewers	X	X	X	

2.03 FITTINGS:

- A. Material and strength of fitting for sewer pipe shall conform to pipe as per ASTM Standards.
- B. PVC pipe fittings (below grade sanitary sewer): Provide fittings produced and recommended for the service indicated by manufacturer of piping.
- C. PVC DWV pipe fittings: ASTM D2665 DWV Schedule 40 socket type. Provide fittings produced and recommended for the service indicated by manufacturer of tubing. Solvent cements as per ASTM 2564.

2.04 JOINTS

- A. Cast iron bell and spigot soil pipe: Pack joints with oakum, fill with molten lead at one pouring, caulk solid flush with hub rim. If approved by Code, pre-set plastic or neoprene joint may be used, ASTM C 564.
- B. Cast iron no-hub pipe: Coupling assembly tightened by torque wrench, CISPI 310, ASTM C 564.
- C. PVC pipe fittings (below grade sanitary sewer): Listed compression type joints.
- D. PVC DWV pipe: Solvent cement in accordance with ASTM D2564.

PART 3 - EXECUTION

3.01 INSPECTION

- A. General: Examine areas and conditions under which storm drainage piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION OF BASIC MATERIALS AND PRODUCTS

- A. General: Install basic materials and products as required per manufacturer's recommendations, International and Uniform Plumbing Codes, and as required to meet the intent of the documents.
- B. Piping Specialties: Refer to Section 22 05 00 - Common Work Results for Plumbing.
- C. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.
- D. Lay building storm drains beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements and other special installation requirements. Clear interior of piping of dirt and other superfluous materials as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops. Where piping must cross footings, the piping shall cross under footings unless noted otherwise on the drawings.
- E. Install storm water piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller and 1/8" per foot (1%) for piping 4" and larger.

3.03 STORM DRAINAGE PIPING

- A. Install pipe for all storm drainage systems as indicated on drawings, as called for in other sections, and as specified herein.

- B. Arrange and install piping approximately as indicated; straight, plumb, and as direct as possible; form right angles on parallel lines with building walls. Keep pipes close to walls and avoid interference with other trades. Locate groups of pipes parallel to each other; space at a distance to permit applying full insulation and to permit access for servicing valves. Most piping to be run in concealed locations unless indicated exposed, or in equipment rooms. Locate piping to avoid ductwork.
- C. Install horizontal piping as high as possible without sags or humps so that proper grades can be maintained for drainage.
- D. Check all piping for interference with other trades; avoid placing water pipes over electrical equipment.
- E. Where rough-in is required for equipment furnished by others, verify exact rough-in dimension with owner or equipment supplier before roughing-in.
- F. Underground installation of thermoplastic pipe shall be done in accordance with ASTM D 2321.

3.04 FIELD QUALITY CONTROL

- A. Piping Tests: Test storm drainage piping in accordance with testing requirements of Division 22 Basic Materials and Methods, Section 22 00 10 - Plumbing General Provisions.

3.05 TESTS AND DEMONSTRATIONS

- A. Tests Required: Piping shall be tested and proved tight under the following static pressures. Pressure shall be maintained for four (4) hours.

<u>System</u>	<u>Pressure</u>
Storm Drainage Piping Above Grade	Fill piping with water to top of vent outlet above roof, or 10 feet waterhead.

TESTING NOTE: All rubber gasket joints for cast iron soil pipe and fittings should be properly restrained if test pressures exceed 10 feet of head.

- B. All systems shall be tested by Contractor and placed in proper working order prior to demonstrating systems to Owner. Provide notification seven days prior to testing. Contractor shall submit a report to Design Professional citing dates, times, pressures, and results of all tests performed.

END OF SECTION 22 14 13

SECTION 22 15 16
FACILITY NATURAL GAS PIPING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all equipment, materials, tools, labor and supervision necessary to fabricate and install complete piping system as required by the drawings and this section.
 - 1. Extent of natural gas piping work is indicated on drawings and schedules, and by requirements of this section.
 - 2. Installation of valves for natural gas piping system is specified in other Division-22 sections and is included as work of this section.
- B. Trenching and Backfill: Trenching and backfill required in conjunction with gas service piping is specified in applicable Division 22 sections and is included as work of this section.

1.03 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and install natural gas systems in accordance with NFPA 54 "National Fuel Gas Code".
- B. Utility Compliance: Fabricate and install natural gas systems in accordance with local gas utility company requirements.
- C. UPC Compliance: Fabricate and install natural gas systems in accordance with IAPMO "Uniform Plumbing Code".

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's catalog cut sheets and schedules for all materials and components.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Startup and test reports.
 - 3. Manufacturer's Warranty: Submit manufacturers standard warranty document.
 - 4. Spare Parts.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Pressure Regulators:
 - 1. Cashco
 - 2. Fisher
 - 3. Maxitrol
- B. Plug Valves
 - 1. Homestead
 - 2. Nordstrum
 - 3. Walworth
 - 4. DeZurik

- C. Ball Valves
 - 1. Watts
 - 2. Nibco
 - 3. Apollo
 - 4. Milwaukee

2.02 BASIC MATERIALS AND PRODUCTS

- A. General: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide materials and products complying with NFPA 54 where applicable; base pressure rating on natural gas piping system's maximum design pressures. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in natural gas piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- B. Piping Specialties: Refer to Section - 22 05 00 - Common Work Results for Plumbing.
- C. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.

2.03 PIPE:

<u>Material</u>	<u>Service</u>
A. Black steel pipe Schedule 40, ASTM A53	Interior natural gas piping.

2.04 FITTINGS:

- A. Steel Pipe:
 - 1. Threaded pipe (2" dia and smaller): Malleable iron fittings, 125 pound standard flat band water pattern.
 - 2. Welded pipe (2 1/2" dia and larger): Standard radius weld fittings and weld neck or slip-on flanges, same material and strength as pipe.

2.05 JOINTS

- A. Steel Pipe:
 - 1. Threaded pipe (2" dia and smaller): Make joints using Teflon tape applied to male threads only. Cut pipe square, cut threads clean, remove burrs and ream ends to full size of bore. For fuel piping and lubricating oil piping, joint sealing material shall be resistant to petroleum products.
 - 2. Welded pipe (2 1/2" dia and larger): Welding shall conform to welding section of ANSI-B31.3 "Code for Power Piping."

2.06 NIPPLES AND UNIONS

- A. All nipples shall conform to size, weight and strength of adjoining pipe. When length of unthreaded portion of nipple is less than 1-1/2", use extra strong nipple; do not use close nipples.
- B. For pipe 2" and smaller, use screwed unions, for pipe 2-1/2" and over use flanged unions. For steel pipe use black or galvanized malleable iron unions, to conform to pipe with ground joint. Cast iron flanged unions gasket type. For threaded brass pipe, use bronze ground joint unions with octagon ends.
- C. Install unions in the following locations so that a minimum amount of pipe need be disassembled:
 - 1. In by-pass around equipment, valves, and controls.
 - 2. In connections to equipment.
 - 3. Where indicated on drawings.

2.07 VALVES

- A. Natural Gas: 2" and smaller: Two-piece full-port bronze ball valve, suitable for natural gas service, threaded ends.

- B. Natural Gas: 2 1/2" to 6": Carbon steel or cast iron plug valve MSS SP-78, WOG (suitable for natural gas service) with flanged ends.
- C. Natural Gas Meter Valve: Provide with tamper-proof operator.

PART 3 - EXECUTION

3.01 INSPECTION

- A. General: Examine areas and conditions under which natural gas piping systems materials and products are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION OF BASIC MATERIALS AND PRODUCTS

- A. General: Install basic materials and products as per manufacturer=s recommendations, Uniform Plumbing Code, local code requirements, Utility Company requirements and as required to meet the intent of the document.
- B. Natural Gas Piping
 - 1. Install pipe for all natural gas systems as indicated on drawings, as called for in other sections, and as specified herein.
 - 2. Arrange and install piping approximately as indicated; straight, plumb, and as direct as possible; form right angles on parallel lines with building walls. Keep pipes close to walls and avoid interference with other natural gas items. Locate groups of pipes parallel to each other; space at a distance to permit applying full insulation and to permit access for servicing valves. Most piping to be run in concealed locations unless indicated exposed, or in equipment rooms. Locate piping to avoid ductwork.
 - 3. Install horizontal piping as high as possible without sags or humps so that proper grades can be maintained for drainage.
 - 4. Check all piping for interference with other trades; avoid placing pipes over electrical equipment.
 - 5. Where rough-in is required for equipment furnished by others, verify exact rough-in dimension with owner or equipment supplier before roughing-in.
 - 6. Piping up to 2" diameter shall be screwed, piping 2-1/2" diameter and over shall be welded. Concealed gas piping shall be welded or otherwise installed as required per NFPA 54 and local code.
 - 7. Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or equipment connections are completed.
 - 8. Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.
 - 9. Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.
 - 10. Exposed outside pipe: Prime coat with appropriate lead oxide paint and apply finish enamel coat to match color of adjacent building material.
- C. Valves
 - 1. Locate valves for easy access and operation. Do not locate valves with stems below horizontal.
 - 2. Sectional Valves: Install on each branch and riser, close to main, where branch or riser serves 2 or more natural gas terminals or equipment connections, and elsewhere as indicated.
 - 3. Shutoff Valves: Install on inlet and outlet of each natural gas equipment item, and on inlet of each natural gas terminal, and elsewhere as indicated.
 - 4. Drain Valves: Install on each natural gas equipment item located to completely drain equipment for service or repair. Install at base of each riser, at base of each rise or drop in piping system, and elsewhere where indicated or required to completely drain natural gas piping system.
- D. Piping Specialties: Refer to Section 22 05 00 - Common Work Results for Plumbing.
- E. Supports, Anchors and Seals: Refer to Section 22 05 29 - Hangers and Supports for Plumbing Piping.

- F. Install specialties and accessories as indicated on drawings and in accordance with manufacturer's recommendations and applicable codes and standards.

3.03 INSTALLATION OF EQUIPMENT CONNECTIONS

- A. General: Connect gas piping to each gas fired equipment item, with drip leg and shutoff gas cock. Comply with equipment manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

- A. Piping Tests: Inspect, test, and purge natural gas systems in accordance with NFPA 54, and local utility company requirements.

3.05 TESTS AND DEMONSTRATIONS

- A. Tests Required: Piping shall be tested and proved tight under the following static pressures. Pressure shall be maintained for four (4) hours.

<u>System</u>	<u>Pressure</u>
Natural Gas Piping	10 psi air pressure, liquid soap test around all joints.

- B. All systems shall be tested by Contractor and placed in proper working order prior to demonstrating systems to Owner. Provide notification seven days prior to testing. Contractor shall submit a report to Design Professional citing dates, times, pressures, and results of all tests performed.

3.06 ADJUSTING AND CLEANING

- A. Cleaning and Inspecting: Clean and inspect natural gas systems in accordance with requirements of Division 22 Basic Mechanical Materials and Methods, Section 22 00 10 – Plumbing General Provisions.

3.07 SPARE PARTS

- A. Valve Wrenches: Furnish to Owner, with receipt, 2 valve wrenches for each type of gas valve installed, requiring same.

END OF SECTION 22 15 16

SECTION 22 34 00
FUEL-FIRED DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of plumbing equipment work is indicated on drawings and provisions of this section, including schedules and equipment lists associated with either drawings or this section.
- B. Types of plumbing equipment required for project include the following:
 - 1. Water Heaters
 - 2. Instantaneous Water Heaters

1.03 QUALITY ASSURANCE

- A. UL and NEMA Compliance: Provide electric motors and electrical components required as part of plumbing equipment, which have been listed and labeled by Underwriters Laboratories and comply with NEMA standards.
- B. NEC Compliance: Comply with National Electrical Code (ANSI/NFPA 70) as applicable to installation and electrical connections of ancillary electrical components of plumbing equipment.
- C. ANSI Compliance: Comply with ANSI Z223.1 (NFPA 54) "National Fuel Gas Code", as applicable to installation of gas fired water heaters.
- D. AGA Labels: Provide water heaters which have been listed and labeled by American Gas Association.
- E. ANSI/NSF 372 Certification: Fuel-Fired Domestic Water Heaters shall meet the requirements of ANSI/NSF 372 Certification, Drinking Water System Components, Lead Content.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data: provide one submittal containing the following information:
 - 1. Manufacturer's plumbing equipment specifications, installation and start up instructions, with capacity and ratings clearly marked.
 - 2. Drawings: Submit assembly type drawings indicating dimensions, weights, required clearances, and methods of assembly of all components.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Operation and Maintenance Data: Include detailed information on setup.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Domestic Hot Water Insulated Storage Tanks
 - 1. A.O. Smith, Consumer Products Div.
 - 2. Rheem
 - 3. Cemline

2.02 WATER HEATERS

A. Domestic Hot Water Insulated Storage Tank

1. General: Provide domestic hot water storage tanks of size and capacity as indicated on schedule. Jacketed and insulated tank shall meet R12.5 minimum thermal insulation requirements of the U.S. Department of Energy and current edition of ASHRAE/IESNA 90.1.
2. Tank: Constructed and stamped according to ASME specification for working pressure of 150 psi; magnesium anode rod; glass lining on internal surfaces exposed to water. Inspection openings shall be installed in accordance with ASME code requirements and manufacturer's standard practice.
3. Jacket: Provide outer steel jacket with tank insulation and baked enamel finish.
4. Warranty: Furnish 5 year limited warranty for tank leakage.
5. Accessories: Provide ring base, brass drain valve; port for tank sensor/aquastat connection.

PART 3 - EXECUTION

3.01 INSTALLATION OF WATER HEATERS

A. Gas fired Water Heaters

1. General: Install gas fired water heaters as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.
2. Support: Set units and orient so controls and devices needing service and maintenance have adequate access. Level and plumb unit.
3. Gas Supply: Connect to gas line with drip leg, tee, gas cock and union; full size of unit inlet connection. Locate piping so as not to interfere with service of unit.
4. Piping: Connect hot and cold water piping to units with shutoff valves and unions.
5. Start Up: Start up, test and adjust gas fired water heaters in accordance with manufacturer's start up instructions, and Utility Company's requirements. Check and calibrate controls, adjust burner for maximum efficiency.
6. Pressure and Temperature Relief: Route pipe to nearest indirect sanitary drain. Pipe size to match relief connection size.

B. Domestic Hot Water Insulated Storage Tank

1. General: Install domestic hot water storage tanks as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.
2. Support: Set units and orient so controls and devices needing service and maintenance have adequate access. Level and plumb unit.

3.02 TRAINING AND DEMONSTRATIONS

A. Equipment training:

1. Manufacturer's representative and contractor shall provide 2 hours (min) instruction on each water heater.
2. Training sessions shall use the printed installation, operation and maintenance instruction materials included in the O&M manuals and emphasize preventative maintenance and safe operating procedures.
3. Training shall be performed by qualified factory trained technicians.
4. Plumbing Contractor shall attend all sessions performed by the manufacturer's representative and shall add to each session any special information relating to the details of installation of the equipment as it might impact the operation and maintenance.
5. Equipment training shall occur as soon as possible after start up of the equipment and shall include hands-on operation..

END OF SECTION 22 34 00

SECTION 22 40 00
PLUMBING FIXTURES

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 22 00 10 - Plumbing General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Provide material, equipment, labor and supervision necessary for the plumbing fixture installation as required by the drawings and this section.
- B. Fixtures, trim and accessories shall be of type and model numbers as scheduled on the drawings.

1.03 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product data – provide one submittal containing the following information:
 - 1. Manufacturer's catalog cuts giving manufacturer's model numbers, fixture and rough in dimensions, and construction material for each type of fixture, trim and accessory scheduled.
 - 2. Furnish rough-in information that impacts other trades to General Contractor for distribution to other sub-contractors. This includes, but is not limited to, sink cut out templates, shower/tub framing dimension drawings, electrical power rough-in dimension drawings, etc.

1.04 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - 2. Manufacturer's Warranty: Submit manufacturers standard warranty document.

1.05 QUALITY ASSURANCE

- A. ANSI/NSF 372 Certification: All potable water supply piping and valves shall meet the requirements of ANSI/NSF 372 Certification, Drinking Water System Components, Lead Content.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Vitreous China and Cast Iron Enameled Fixtures
 - 1. American Standard
 - 2. Kohler
 - 3. Zurn
 - 4. Sloan
- B. Faucets
 - 1. American Standard
 - 2. Chicago Faucet
 - 3. Delta
 - 4. Elkay
 - 5. Kohler
 - 6. T & S Brass Works
 - 7. Sloan
 - 8. Zurn

- C. Flush Valves
 - 1. Sloan - Royal Series
 - 2. Zurn – Aquavantage Series
- D. Fiberglass Tub and Shower Modules
 - 1. Aquarius
 - 2. Oasis
 - 3. Aquatic
 - 4. Best Bath
 - 5. Neo-Metro
- E. Shower Valves
 - 1. Leonard
 - 2. Symmons
 - 3. Delta
 - 4. Kohler
 - 5. Bradley
 - 6. Acorn Engineering
- F. Thermostatic Mixing Valves
 - 1. Leonard
 - 2. Powers
 - 3. Symmons
 - 4. Apollo
 - 5. Lawler
 - 6. Acorn Controls

2.02 VITREOUS AND CAST IRON FIXTURES

- A. Vitreous ware shall be non absorbant, even color, unwarped, two fired vitreous china, grade "A" as rated by the Bureau of Standards.
- B. Enameled cast iron fixtures shall have the enamel fused with the iron to provide a hard acid resisting enameled finish.
- C. Vitreous and enamel fixtures shall be white, except where other colors are called for in the schedule.
- D. Bath tubs shall have slip resistant surface.
- E. Fiberglass, gel-coat fixtures shall incorporate Microban antimicrobial protection.

2.03 ACCESSORIES

- A. Accessories to include supply pipes, stop valves, faucets, tail pieces, strainers, waste and traps. Floor and wall plates shall be brass. Exposed accessories shall be chrome plated.
- B. Potable water supply piping, faucets and fixtures and associated accessories (excluding toilets, urinals, fill valves, flush valves, and shower valves) shall meet the certification requirements of ANSI/NSF 372 – Drinking Water System Components, Lead Content.
- C. Stop valves shall be compression type with loose key control.
- D. P-trap shall be adjustable 18 gauge tubular brass. Where offset P-traps are required for handicapped accessible lavatories, offset and P-trap shall be insulated with Handi Lav-Guard by Truebro, or equal. When supply risers are exposed, they shall be insulated with Handi Lav-Guard by Truebro, or equal.
- E. Accessories shall be considered "exposed" even when concealed behind base cabinets having doors.
- F. Mixing valve, transformer, or piping under the counter shall be covered with Lav-Shield by Truebro or equal in areas where a cabinet does not cover them.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install fixtures and make water supply, waste and vent connections as indicated on the drawings.
- B. Set fixtures in center of stalls, between partitions where required. Dimensions for spacing shall be verified with General Contractor. Fixtures in ADA accessible stalls shall be installed with the flush valve handle to the open side of the stall, where applicable.
- C. Setting shall be absolutely tight and rigid on proper ground. Use Miracle Adhesive Corporation Tub Caulk or approved equal pointing material under all setting surfaces.
- D. Wall hung fixtures shall be securely hung. All wall hung fixtures shall have carriers unless other mounting means are approved by Design Professional. Mounting heights shall be as indicated on Architectural elevations, and in accordance with the requirements of the ADA.
- E. Fixtures shall be covered after they are set to prevent damage during the balance of construction. At the conclusion of work, the covering shall be removed and the fixtures properly cleaned.
- F. Contractor shall be responsible for the protection of the fixtures until acceptance by Owner. Damaged fixtures shall be replaced at no additional cost to Owner.
- G. Joints of lavatories with counter and/or wall, sinks with wall, urinals with wall and water closets with wall and/or floor shall be caulked with transparent silicone caulk by Contractor.

END OF SECTION 22 40 00

SPECIAL PROVISIONS
PROJECT MANUAL - ELECTRICAL
SECTION 01300

DIVISION 26 – ELECTRICAL

26 0010	ELECTRICAL GENERAL PROVISIONS
26 0500	COMMON WORK RESULTS FOR ELECTRICAL
26 0519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 0533	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 0553	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 2416	PANELBOARDS
26 2726	WIRING DEVICES
26 5000	LIGHTING

SECTION 26 00 10
ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Refer to Division 00 – Procurement, Contracting and Warranty Requirements and Division 01 - General Requirements, which all apply to work under this section.

1.02 DESCRIPTION OF WORK

- A. Work shall include furnishing of all systems, equipment and material specified in this division and as called for on the electrical drawings, to include supervision, operations, methods and labor for the fabrication, installation, start up and tests for the complete electrical installation.
- B. All elements of the construction shall be performed by workmen skilled in the particular craft involved, and regularly employed in that particular craft.
- C. All work shall be performed in a neat, professional manner in keeping with the highest standards of the craft.

1.03 CODES AND STANDARDS

- A. All work shall be done in accordance with the applicable portion of the following codes and standards:
 - 1. National Electrical Code
 - 2. National Fire Protection Association
 - 3. National Electrical Manufacturers Association
 - 4. Standards of Institute of Electrical and Electronic Engineers
 - 5. International Building Code
 - 6. Occupational Safety and Health Act
 - 7. Iowa Administrative Code
 - 8. NECA Standards
 - 9. Americans With Disabilities Act (ADA)
- B. All Contractors shall familiarize themselves with all codes and standards applicable to their work and shall notify Design Professional of any discrepancies between the design and applicable code requirements so that any conflicts can be resolved. Where two or more codes or standards are in conflict, that requiring the highest order of professionalism shall take precedence, but such questions shall be referred to Design Professional for final decision.

1.04 REQUIREMENTS & FEES OF REGULATORY AGENCIES

- A. Secure all required permits and pay for all inspections, licenses and fees required in connection with the electrical work including State of Iowa Electrical Inspections. Contractor shall post all bonds and obtain all licenses required by the State, City, County and Utility.

1.05 ELECTRICAL DRAWINGS

- A. The electrical drawings indicate in general the building arrangement only. Contractor shall examine construction drawings to become familiar with the specific type of building construction, i.e. type of structural system, floors, walls, ceilings, room finishes and elevations.
- B. Drawings for the electrical work are in part diagrammatic, and are intended to convey the scope of the work and to indicate in general the location of equipment.
- C. Contractor shall layout their own work and shall be responsible for determining the exact locations for equipment and rough ins and the exact routing of conduits and raceway so as to best fit the layout of the work.
- D. Contractor shall take their own field measurements for verifying locations and dimensions; scaling of the drawings will not be sufficient for laying out the work.

- E. Because of the scale of the drawings, certain basic items such as couplings, pull or splice boxes may not be shown, but where such items are required by code or by other sections of the specifications or where they are required for proper installation of the work, such items shall be furnished and installed.

1.06 ACTIVE SERVICES

- A. Contractor shall be responsible for verifying exact locations of all existing services prior to beginning work in that area.
- B. Existing active services, i.e., water, gas, sewer, electric, when encountered, shall be protected against damage. Do not prevent or disturb operation of active services which are to remain.
- C. When active services are encountered which require relocation, Contractor shall make request to authorities with jurisdiction for determination of procedures.
- D. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the authorities having jurisdiction.

1.07 SITE INSPECTION

- A. Contractor shall inspect the site prior to submitting bid for work to familiarize themselves with the conditions of the site which will affect their work and shall verify points of connection with utilities, routing of outside conduit to include required clearances from any existing structures, trees or other obstacles.
- B. Extra payment will not be allowed for changes in the work required because of Contractor's failure to make this inspection.

1.08 COORDINATION AND COOPERATION

- A. It shall be Contractor's responsibility to schedule and coordinate their work with the schedule of the General Contractor so as to progress the work expeditiously, and to avoid unnecessary delays.
- B. Contractor shall fully examine the drawings and specifications for other trades and shall coordinate the installation of their work with the work of the other contractors. Contractor shall consult and cooperate with the other contractors for determining space requirements and for determining that adequate clearance is allowed with respect to their equipment, other equipment and the building. The Design Professional reserves the right to determine space priority of the contractors in the event of interference between piping, conduit, ducts and equipment of the various contractors.
- C. Drawings and specifications are intended to be complimentary. Any work shown in either of them, whether in the other or not, shall be executed according to the true intent and meaning thereof, the same as if set forth in all. Conflicts between the drawings and the specifications or between the requirements set forth for the various contractors shall be called to the attention of the Design Professional. If clarification is not asked for prior to the taking of bids, it will be assumed that none is required, and that the Contractor is in agreement with the drawings and specifications as issued. If clarification is required after the contract is awarded, such clarification will be made by the Design Professional and their decision will be final.
- D. Special care shall be taken for protection for all equipment. All equipment and material shall be completely protected from weather elements, painting, plaster, etc., until the project is substantially completed. Damage from rust, paint, scratches, etc., shall be repaired as required to restore equipment to original condition.
- E. Protection of all equipment during the painting of the building shall be the responsibility of the Painting Contractor, but this shall not relieve Contractor of the responsibility for checking to assure that adequate protection is being provided. Refer to Division 09 for painting protection.
- F. Where the final installation or connection of equipment in the building requires the contractor to work in areas previously finished by the General Contractor, the Electrical Contractor shall be responsible that such areas are protected and are not marred, soiled or otherwise damaged during the course of such work. Electrical Contractor shall arrange with the General Contractor for patching and refinishing of such areas which may be damaged in this respect.

1.09 OPENINGS, CUTTING AND PATCHING

- A. Refer to Division 1 for additional cutting and patching information. Refer to Division 07 for additional information regarding Firestopping and Joint Sealants.
- B. Conduits and wireways passing through all fire or smoke rated floors, roofs, walls, and partitions shall be provided with firestopping. Space between wall/floor and conduits, sleeves and/or wireways, shall be sealed with UL listed intumescent fire barrier material equivalent to rating of wall/floor. Where conduits, sleeves and/or wireways pass through floors, roofs, walls and partitions that are not fire or smoke rated, penetrations shall be sealed with grout or caulk
- C. New structure:
 - 1. Contractor will coordinate the placing of openings and lintels in the new structure as required for the installation of the electrical work with the General Contractor.
 - 2. Contractor shall furnish to General Contractor the accurate locations and sizes for required openings, but this shall not relieve Contractor of the responsibility of checking to assure that proper size openings are provided. When additional cutting and patching is required due to Contractor's failure to coordinate this work, Contractor shall make arrangements for the cutting, patching, and painting required.
- D. Existing Structure:
 - 1. Contractor shall provide cutting, lintels and patching, and patch painting in the existing structure, as required for the installation of their work, and shall furnish lintels and supports as required for openings.
 - 2. Cutting of structural support members will not be permitted without prior approval of the Design Professional. Extent of cutting shall be minimized; use core drills, power saws or other machines which will provide neat, minimum openings.
 - 3. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.

1.10 MATERIALS AND EQUIPMENT

- A. All materials and equipment shall be the standard product of a reputable U.S.A. manufacturer regularly engaged in the manufacture of the specified item unless authorized in writing by Design Professional. Where more than one unit is required of the same system, they shall be furnished by the same manufacturer except where specified otherwise.
- B. All material and equipment shall be installed in strict accordance with the manufacturer's recommendations.
- C. The equipment specifications cannot deal individually with any minute items such as parts, controls, devices, etc., which may be required to produce the equipment performance and function as specified, or as required to meet the equipment guarantees. Such items when required shall be furnished as part of the equipment, whether or not specifically called for.

1.11 SUBMITTALS

- A. Contractor shall furnish, to the Design Professional, complete sets of shop drawings and other submittal data. Contractor shall review and sign shop drawings before submittal. Refer to Division 01 specifications for additional requirements.
- B. Shop drawings shall be bound into sets and cover related items for a complete system as much as practical and shall be identified with symbols or "plan marks" used on drawings. Incomplete, piecemeal or unbound submittals will be rejected.
- C. Submittal requirements are indicated in each corresponding technical specification section in the Project Manual.
- D. After award of contract, the contractor shall provide a completed submittal schedule including dates that the submittals will be to the Design Professional for review.
- E. Design Professional will review shop drawings solely to assist contractors in correctly interpreting the plans and specifications.

- F. Contract requirements cannot be changed by shop drawings which differ from contract drawings and specifications.

1.12 OPERATION AND MAINTENANCE MANUALS

- A. Operation and maintenance manuals shall be submitted to Design Professional. Refer to Division 01 specifications for additional information.
- B. Submit manuals in duplicate upon completion of the job. Manuals shall be bound in a three ring hard-backed binder. Front cover and spine of each binder shall have the following lettering done:

OPERATION
AND
MAINTENANCE
MANUAL
FOR
ELECTRICAL SYSTEMS

(PROJECT NAME)
(LOCATION)
(DATE)

SUBMITTED BY
(NAME AND ADDRESS OF CONTRACTOR)

- C. Provide a master index at the beginning of manual showing items included. Use plastic tab indexes for sections of manual. Each section shall contain the following information for equipment furnished under this contract:
1. Equipment and system warranties and guarantees.
 2. Installation instructions.
 3. Operating instructions.
 4. Maintenance instructions.
 5. Spare parts identification and ordering list.
 6. Local service organization, address, contact and phone number.
 7. Shop drawings with reviewed stamp of Design Professional and Contractor shall be included, if applicable, along with the items listed above.
- D. Items to be included shall be those listed in shop drawing section.

1.13 ELECTRICAL TESTING

- A. All systems shall be tested by Contractor and placed in proper working order prior to demonstrating systems to Owner.
- B. Contractor shall test the electrical grounding system resistance in accordance with Specification Section 26 0526 – Grounding and Bonding for Electrical Systems and submit a report to Design Professional stating the results.

1.14 TRAINING AND DEMONSTRATIONS

- A. Prior to acceptance of the electrical installation, the Contractor shall demonstrate to the Owner, or their designated representatives, all essential features and functions of all systems installed, and shall instruct the Owner in the proper operation and maintenance of such systems. Owner instruction shall be provided for the following systems.
1. Provide adequate notice to Owner as to when instruction will be conducted so appropriate personnel can be present.
 2. Prepare the instruction format for a minimum of four Owner Representatives.
- B. System training:
1. These sessions shall include hands-on demonstrations of system wide start-up, operation in all possible modes, shut-down and emergency procedures.
 2. System training shall include, but not be limited to, distribution equipment and branch panel locations, feeder sources, system start-up/shut-down/emergency procedures.

- C. Contractor shall submit to the Design Professional a certificate signed by the Owner stating the date, time, and persons instructed and that the instruction has been completed to the Owner's satisfaction. An example of a certificate form is as follows:

CERTIFICATE OF SYSTEM DEMONSTRATION

This document is to certify that the contractor has demonstrated the hereafter listed systems to the Owner's representatives in accordance with the Contract documents and that the instruction has been completed to the Owner's satisfaction.

A. Project:

B. System(s):

C. Contractor's representatives giving instruction and demonstration:

Contractor: _____

NAMES	DATE	HOURS

D. Owner's representatives receiving instruction:

Owner: _____

NAMES	DATE	HOURS

E. Acknowledgement of demonstration:

Contractor's Representative:

signature

date

Owner's Representative:

signature

date

1.15 SUBSTITUTIONS

- A. Refer to Divisions 00 and 01. Requests shall clearly describe the equipment for which approval is being requested. Include all data necessary to demonstrate that equipment's capacities, features and performance are equivalent between specified equipment and equipment for which approval is being requested. If the equipment is acceptable, Design Professional will approve it in an addendum. Design Professional will, under no circumstances, be required to prove that an item proposed for substitution is or is not of equal quality to the specified item.
- B. Where substitutions are approved, Contractor assumes all responsibility for physical dimensions and all other resulting changes. This responsibility extends to cover all extra work necessitated by other trades as a result of the substitution.

1.16 ACCEPTABLE MANUFACTURERS

- A. In most cases, equipment specifications are based on a specific manufacturer's type, style, dimensional data, catalog number, etc. Listed with the base specification, either in the manual or on the plan schedules are acceptable manufacturers approved to bid products of equal quality. These manufacturers are encouraged to submit to Design Professional at least 8 days prior to the bid due date drawings and catalog numbers of products to be bid as equals.
- B. Manufacturers, who do not submit prior to bidding, run the risk of having the product rejected at time of shop drawing submittal. Extra costs associated with replacing the rejected product shall be the responsibility of the Contractor and/or the manufacturer.
 - 1. If Contractor chooses to use a manufacturer listed as an equal, it shall be their responsibility to assure that the manufacturer has complied with the requirements in 'A' above. Contractor shall assume all responsibility for physical dimensions, operating characteristics, and all other resulting changes. This responsibility extends to cover all extra work necessitated by other trades as a result of using the alternate manufacturer.
 - 2. Where a model or catalog number is provided, it may not be inclusive of all product requirements. Refer to additional requirements provided on the plans or in the specifications as required. Similarly, there may be additional requirements included in the model or catalog number that are not specifically stated. These requirements shall also be met.

1.17 WARRANTY

- A. Refer to Divisions 00 and 01 for information on warranties and correction of work within the warranty period.
 - 1. If a warranty or warranty period are not defined in Division 00 or 01, then the start of all warranty periods shall be the date of Substantial Completion and the length of the warranty shall be for one year.
 - a. If construction is phased with distinct and separate Substantial Completion dates for portions of the building and/or systems, separate warranties shall be provided for each of these phased areas and/or systems.
 - b. The entire Electrical system, including all sub-systems, shall be guaranteed against defect in materials and installation for the duration of the warranty period. Any malfunctions or defects which occur within the warranty period shall be promptly corrected without cost to the Owner. This guarantee shall not limit or void any manufacturer's express or implied warranty.
- B. Refer to other Division 26 sections for systems, equipment, or material requiring extended warranties.
- C. The date of systems/equipment startup or equipment/material shipment to the site shall not be considered the notable date with relation to the warranty of that item. All systems, equipment, material, etc., shall have the same start date with respect to the warranty period.
- D. Systems, equipment or material put into use to facilitate construction activities (e.g. testing and balancing, commissioning, temporary conditioning, etc.) prior to the start of the warranty period shall not impact the length of the warranty in any way.

1.18 CHANGES IN THE WORK

- A. Refer to Divisions 00 and 01.

1.19 COMPLETION

- A. Systems, at time of completion, shall be complete, efficiently operating, non hazardous and ready for normal use by the Owner.
- B. When all the electrical work is complete Contractor shall thoroughly clean all material and equipment installed as a part of this contract and leave all equipment and material in new condition.
- C. Contractor shall clean up and remove from the site all debris, excess material and equipment left during the progress of this contract at job completion.

1.20 CLEANING

- A. Prior to assembly of electrical equipment, all loose dirt, scale, oil, and other foreign matter on internal and exterior surfaces shall be removed by means consistent with good electrical practices.
- B. All temporary labels, stickers, etc., shall be removed from all fixtures and equipment. Name plates, ratings, instruction plates, etc., shall not be obscured by paint, insulation, or placement of units.
- C. Electrical equipment shall be thoroughly cleaned on the interior and exterior of equipment. This includes, but is not limited to: removal of wiring trimmings within electrical panels and dirt/debris from activation boxes.
- D. All light fixtures shall be wiped clean with all fingerprints and dust removed.

1.21 ACCESS DOORS

- A. When the Electrical Contractor provides any equipment requiring periodic servicing which will be concealed by non-accessible architectural construction, the Electrical Contractor shall provide a flush access door. The access door shall be equal to a Karp DSC 214M Universal access door for non-rated construction or KRP-150FR for fire rated construction. Other approved manufacturers include Nystrom, Acudor, and Access Panel Solutions, with model applicable to the specific construction involved.
- B. Access doors in fire rated construction shall be fire rated and have U.L. label.
- C. Construction:
 - 1. Door and trim shall be 13 gauge steel, frames shall be 16 gauge steel.
 - 2. Trim shall be of one piece construction.
 - 3. Finish shall be prime coat of rust inhibitive baked grey enamel.
 - 4. Hinges shall be concealed, offset, floating hinge.
 - 5. Locks shall be flush, screwdriver operated with stainless steel cam and studs.

1.22 TEMPORARY UTILITIES

- A. Refer to Specification Division 1 for specific requirements concerning temporary utilities.

END OF SECTION 26 00 10

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. This section includes the following:
 - 1. Demolition.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials removed shall be the property of the removing contractor and shall be removed from the site unless otherwise specified.

PART 3 - EXECUTION

3.01 GENERAL

- A. Demolition shall be accomplished by the proper tools and equipment for the work to be removed. Personnel shall be experienced and qualified in the type of work to be performed.

3.02 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on casual field observation. Report discrepancies to Owner before disturbing existing installation.

3.03 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Existing Electrical Services: Maintain existing system in service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 72 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- D. Existing Fire Alarm System: Maintain existing system in service. Disable system only to make switchovers and connections. Notify Owner at least 72 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Telecommunications Systems: Maintain existing systems in service. Disable systems only to make switchovers and connections. Obtain permission from Owner at least 72 hours before partially or completely disabling system.

3.04 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction. Extend existing installations using materials and methods as specified.
- C. Remove abandoned wiring to source of supply.

- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- K. Clean and repair existing materials and equipment which remain or are to be reused.

3.05 FLUORESCENT LAMP AND BALLAST DISPOSAL

- A. Unless noted otherwise, all existing fluorescent and HID lamps and ballasts within light fixtures to be removed shall be assumed to contain mercury and PCB's respectively. These items shall be disposed of in accordance with all federal, state and local codes and ordinances. These items are required to be disposed of by a mercury and PCB Disposal Contractor, who shall be a subcontractor to Electrical Contractor. This Disposal Contractor shall have all local, state, and federal authorization for handling, transporting, and processing these materials. Disposal Contractor shall have pollution insurance and shall generate a Certificate of Disposal.

3.06 WORK BY OTHERS

- A. Unless specifically noted under other contracts, Electrical Contractor shall assume all required work shall be included. In general, the following will be performed by others:
 - 1. General Contractor will remove any bases, floor fill, wall work and footings; neatly patch, match, complete and finish all affected surfaces.
 - 2. Mechanical Contractor will disconnect all mechanical services and remove pipe back to behind finish surfaces, close and cap ends of pipe.

3.07 OWNER'S RIGHT OF SALVAGE

- A. Owner may designate and have salvage rights to any material herein demolished by the Contractor.

END OF SECTION 26 05 00

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all material, tools, labor, and supervision necessary to install all wiring systems.
- B. This section describes the basic materials and methods of installation for general wiring systems of 600 volts and less. Wiring for a higher voltage rating, if required, shall be as specified in other sections or called for on the drawings.

1.03 QUALITY ASSURANCE

- A. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wire, cable, and connectors.
- B. UL Compliance: Comply with UL standards pertaining to wire, cable, and connectors.
- C. UL Labels: Provide electrical wires, cables and connectors which have been UL listed and labeled.
- D. NEMA/ICEA Compliance: Comply with applicable portions of NEMA/Insulated Cable Engineers Association standards pertaining to materials, construction and testing of wire and cable.
- E. ANSI/ASTM: Comply with applicable portions of ANSI/ASTM standards pertaining to construction of wire and cable.
- F. The materials used for wiring systems shall be the products of a manufacturer regularly engaged in the manufacturing of the specified material.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's technical product data for each product specified.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings

PART 2 - PRODUCTS

2.01 WIRE AND CABLE

- A. All wire and cable for power, lighting, control, and signal circuits shall have copper conductors of not less than 98% conductivity and shall be insulated to 600 V. Conductor sizes #12 AWG and smaller shall be solid, conductor sizes #10 AWG and larger shall be stranded.
- B. Minimum size conductors shall be #12 AWG for power and lighting.
- C. Type of wire and cable for various applications shall be as follows:
 - 1. Type THHN/THWN-2, or XHHW-2 (90 deg. C) use for branch circuits, panel and equipment feeders in dry locations.
 - 2. For all vibration type installations (i.e. motors, etc.), provide stranded type conductors.

2.02 CONDUCTOR COLOR CODING

- A. Wiring systems shall be color coded. Conductor insulation shall be colored in sizes up through #8 AWG. Conductors #6 AWG and larger shall be colored or have black insulation and shall be phase color coded with one half inch band of colored tape at all junctions and terminations. Colors shall be assigned to each conductor as described below and carried throughout all main and branch circuit distribution. When necessary to use tape, use colored tape on black wire. Do not use colored tape on colored wire.

	120/208V - Wye
Phase 'A' Conductor	Black
Phase 'B' Conductor	Red
Phase 'C' Conductor	Blue
Neutral Conductor	White*
Equipment Grounding Conductor	Green

- * For branch circuits with non-shared neutral conductors, provide colored tracer to match associated phase conductor. Tracers shall be Black, Red, Blue, Brown, Orange, or Yellow.

2.03 CONNECTORS

- A. Twist-on Wire Connectors.
1. Dry Locations. 600V rated, UL 486C listed, Ideal Industries 451/452/454 or equal by 3M or Thomas and Betts. Use for #8 and smaller.
 2. Wet locations. 600V rated, UL 485D listed with pre-filled silicone sealant. Ideal Industries 61/62/63 series or equal by 3M or Thomas and Betts. Use for #8 and smaller. To be used for all above ground splices in exterior locations and interior wet locations.
- B. Push-in Wire Connectors.
1. Dry Locations. 600V rated, UL 486C listed, Ideal Industries 32/33/34 or equal by Wago, 3M or Thomas and Betts. Use for #10 and smaller.
- C. Conductor Taps and Splices.
1. Dry Locations. 600V rated, UL 486A/B listed, insulated mechanical termination. IlSCO ClearTap PCT or equal by Burndy. Use for #6 and larger.
 2. Wet and Underground Locations. 600V rated, UL 486D listed, watertight mechanical termination suitable for direct burial in earth. IlSCO SafetySub PDSS or equal by Burndy or 3M. Use for #6 and larger.
 3. Insulation piercing taps are not allowed.
 4. Split bolt connectors and splices are not allowed.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Wire shall not be installed in the conduit system until the building is enclosed and masonry work is completed.
- B. Conduit shall be swabbed free of moisture and debris prior to pulling in wiring. Pull mouse through conduits prior to pulling conductors.

3.02 INSTALLATION

- A. All cable for major feeders shall be continuous from origin to termination, unless otherwise indicated.
- B. Branch circuit conductor sizes shall be increased to maintain a maximum 3% voltage drop.
1. 120V, 20A homeruns shall be sized as follows based on one-way circuit length:
 - a. 0-80': #12 AWG
 - b. 81'-140': #10 AWG
 - c. 141'- 210': #8 AWG

d. 211' and over: #6 AWG

- C. Conductors for emergency power systems shall be kept entirely independent of all other wiring and equipment. Emergency system wiring shall not occupy the same raceway, wireway or junction box,
- D. Splices shall be made only in accessible junction boxes or handholes.
- E. All power feeder cable shall be pulled with the use of approved pulling compound or powder. Compound must not deteriorate conductor or insulation.
- F. If conductor insulation is damaged during installation, replace entire conductor.
- G. Use pulling means, including fish tape, cable or rope which cannot damage raceway.
- H. Install exposed cable, parallel and perpendicular to surfaces or exposed structural members and follow surface contours, where possible.
- I. Keep branch circuit conductor splices to a minimum.
- J. The continuity of circuit conductors shall not be dependent on service connections such as lamp holders, receptacles, etc., where the removal of such devices would interrupt the continuity.
- K. Provide separate green equipment ground conductor throughout entire electrical system.
- L. All branch circuits shall have dedicated neutrals.

3.03 FIELD QUALITY CONTROL

- A. Prior to energizing system, test cable and wire for continuity of circuitry, and for short circuits. Correct malfunctions when detected.
- B. After wire terminations are complete, energize circuitry and demonstrate functioning in accordance with requirements.

END OF SECTION 26 05 19

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of grounding work is indicated by drawings and shall comply with NEC.
- B. Applications of grounding work in this section include the following:
 - 1. Service equipment.
 - 2. Enclosures.
 - 3. Equipment.
- C. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.

1.03 QUALITY ASSURANCE

- A. NEC Compliance: Comply with NEC requirements as applicable to materials and installation of electrical grounding systems, associated equipment and wiring. Provide grounding products which are UL-listed and labeled.
- B. UL Compliance: Comply with applicable requirements of UL Standards Nos. 467 and 869 pertaining to electrical grounding and bonding.
- C. IEEE Compliance: Comply with applicable requirements of IEEE Standard 142 and 241 pertaining to electrical grounding.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data: provide one submittal containing the following information:
 - 1. Submittal data for equipment, cabling, and hardware shall consist of catalog cuts showing technical data necessary to evaluate the materials with specific item designated by arrow or by being highlighted.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings.

PART 2 - PRODUCTS

2.01 GROUNDING SYSTEMS

- A. Materials and Components
 - 1. General: Except as otherwise indicated, provide electrical grounding systems indicated; with assembly of materials, including, but not limited to, cables/wires, connectors, terminals (solderless lugs), grounding rods/electrodes and plate electrodes, bonding jumper braid, surge arresters, and additional accessories needed for complete installation. Where more than one type unit meets indicated requirements, selection is Installer's option. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE, and established industry standards for applications indicated.
 - 2. All components shall be listed under ANSI/UL 467 – "Grounding and bonding Equipment".
 - 3. Raceways: Provide raceways, and electrical boxes and fittings complying with Division 26, Section 26 05 33 – Raceway and Boxes for Electrical Systems.

4. Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC.
- B. Connectors
 1. Lugs: Grounding and bonding conductors shall terminate in two-hole, long barrel irreversible compression lugs, Burndy YGA series or equal by Blackburn, IlSCO, Erico, Harger or Anderson. All connectors shall be UL476 listed.

2.02 INSTALLATION OF ELECTRICAL GROUNDING

- A. General: Install electrical grounding systems where shown, in accordance with applicable portions of NEC, with NECA's "Standard of Installation", and in accordance with recognized industry practices to ensure that products comply with requirements and serve intended functions.
- B. Coordinate with other electrical work as necessary to interface installation of electrical grounding system with other work.
- C. When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.
- D. Provide separate green ground conductor throughout entire electrical system sized as required by the NEC.
- E. Conduit Grounding
 1. Bond all metallic conduit systems together to provide a continuous electrical ground path. Bond metallic conduits to other conduit components using insulated ground bushings when required. Connect ground bushings to the grounding system using conductors sized in compliance with NEC.
 2. Provide ground conductors in non-metallic conduits in accordance with the NEC.
- F. All portions of the metal building structure that are not electrically continuous shall be bonded to the service entrance grounding electrode system.

END OF SECTION 26 05 26

SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Provide materials, labor and supervision as necessary to provide hangers and supports for conduit, fixtures and equipment.

1.03 QUALITY ASSURANCE

- A. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical supporting devices.
- B. ANSI/NEMA Compliance: Comply with applicable requirements of ANSI/NEMA Std. Pub. No. FB 1, "Fittings and Supports for Conduit and Cable Assemblies".
- C. NECA Compliance: Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports, and equipment mounting.
- D. UL Compliance: Provide electrical components which are UL listed and labeled.

PART 2 - PRODUCTS

2.01 MANUFACTURED SUPPORTING DEVICES

- A. Manufacturer: Subject to compliance with requirements, provide channel systems of one of the following:
 - 1. B Line Systems, Inc.
 - 2. Thomas & Betts, Superstrut
 - 3. Unistrut Div.; Tyco International
 - 4. Globestrut
- B. General: Provide supporting devices; complying with manufacturer's standard materials, design and construction in accordance with published product information, and as required for a complete installation; and as herein specified. Where more than one type of device meets indicated requirements, selection is Installer's option.
- C. Conduit Cable Supports: Provide cable supports with insulating wedging plug for non armored type electrical cables in risers; construct for rigid metal conduit; type wire as indicated; construct body of malleable iron casting with hot dip galvanized finish.
- D. U Channel Strut Systems: Provide U channel strut system for supporting electrical equipment, 16 gauge minimum, of types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface.
 - 1. Metallic Coatings:
 - a. Hot-dip galvanized after fabrication. Conform to ASTM A1011 SS GR 33, Finish conform to ASTM A123
 - b. Pre galvanized conform to ASTM A653 SS GR 33, G90.
 - 2. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating. Conform to ASTM A1011 SS GR 33, E-Coat finish.
 - 3. Channel Dimensions: Selected for applicable load criteria.

PART 3 - EXECUTION

3.01 INSTALLATION OF SUPPORTING DEVICES

- A. Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to ensure supporting devices comply with requirements.

- B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
- C. Conduit hangers and support devices shall be approved type for the method of supporting required. Size supports as necessary per manufacturer's recommendations for the weight being supported. All hangers and supports shall have galvanized finish or other approved corrosion resistance finish. In general, hangers and supports shall be as follows:
 - 1. Where single or multiple run of conduit is routed on surface of structure; use conduit clamps mounted on U channel strut so as to maintain not less than 1" clearance between conduit and structure.
 - 2. Where single run of conduit is suspended from overhead; use split ring conduit clamp suspended by 3/8" steel drop rod.
 - 3. Where multiple parallel runs of conduit are suspended from overhead; use split ring conduit clamps uniformly spaced and supported on trapeze hangers fabricated of U channel strut, suspended by not less than two steel drop rods.
 - 4. Where circuit voltage is above 600 volts, conduit clamps shall be provided with insulating bushings of dielectric strength as required.
 - 5. Where conduit is buried in concrete floor topping; anchor conduit to structural floor with one-hole jiffy clamps.
 - 6. Maximum hanger and support spacing shall be in accordance with NEC.
- D. Hangers and supports shall be anchored to structure as follows:
 - 1. Hangers and supports anchored to poured concrete, use malleable iron or steel concrete inserts attached to concrete forms.
 - 2. Hangers or supports anchored to precast concrete, use self drilling expansion shields. Expansion shields may be used where concrete inserts have been missed or additional support is required in poured concrete.
 - 3. Hanger or supports anchored to structural steel, use beam clamps and/or steel channels as required by structural system.
 - 4. Hangers or supports anchored to metal deck, use spring clips or approved welding pins. Maximum permissible load on each hanger shall not exceed 50 pounds.
 - 5. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls.
 - 6. Use sheet metal screws in sheet metal studs and wood screws in wood construction.
- E. The following is not permitted:
 - 1. Attaching supports and hangers to piping, ductwork, mechanical equipment, conduit, ceiling tiles, ceiling support wires, or the like.
 - 2. Use of powder-actuated anchors.
 - 3. Drilling of structural steel members.
- F. Fixtures on plastered or acoustical ceilings shall not be supported directly on ceiling tile. Provide metal bar hangers or U channel strut attached to ceiling supports.
- G. Where disconnect switches and panels cannot be mounted on wall, provide support racks fabricated of structural steel or U channel strut.
- H. U Channel Strut Application
 - 1. Interior dry locations:
 - a. PVC, Polyurethane or polyester coating.
 - b. Pre galvanized steel.
 - 2. Exterior and wet locations:
 - a. Hot dipped galvanized steel.

END OF SECTION 26 05 29

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all materials, tools labor and supervision necessary to fabricate and install complete conduit systems.
- B. Conduit systems shall be provided for all wiring, except where the drawings or other sections of the specifications indicate that certain wiring may be installed in cable trays, surface raceway, underfloor raceway, wireways and/or auxiliary gutters.
- C. Types of raceways in this section include the following:
 - 1. Electrical Metallic Tubing (EMT)
 - 2. Flexible Metal Conduit (FMC)
 - 3. Liquidtight Flexible Metal Conduit (LFMC)
 - 4. MC cable.
 - 5. Surface metal raceways.
- D. Refer to 26 05 53 Identification for Electrical Systems for required factory colored conduit requirements.
- E. Contractor shall furnish all material, tools, labor and supervision necessary to install electrical boxes and fittings as required by drawings and specifications.
- F. Types of electrical boxes and fittings in this section include the following:
 - 1. Outlet boxes.
 - 2. Junction boxes
 - 3. Pull boxes
 - 4. Wireways
 - 5. Activation boxes

1.03 QUALITY ASSURANCE

- A. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways.
- B. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to electrical raceway systems; and provide products and components which have been UL listed and labeled.
- C. NEC Compliance: Comply with requirements as applicable to the construction and installation of raceway systems.
- D. The materials used in the fabrication of the raceway system shall be products of a manufacturer regularly engaged in the manufacturing of the specified material.
- E. NEC compliance: Comply with NEC as applicable to construction and installation of electrical wiring boxes and fittings.
- F. UL Compliance: Provide electrical boxes and fittings which have been UL listed and labeled.
- G. ANSI/NEMA Standards Compliance: Comply with ANSI C 134.1 (NEMA Standards Pub No. OS 1) as applicable to sheet steel outlet boxes, covers and box supports.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.

- B. Provide one submittal containing the following information:
 - 1. Raceway Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations, for each type of raceway listed below. Include data substantiating that materials comply with requirements for the following:
 - a. Raceway
 - b. MC Cable
 - c. Surface Metal Raceway
 - 2. Activation Box Product Data: Submit manufacturer's data including specifications, installation instructions and general recommendations for each type of activation box required. Include data substantiating that units comply with requirements.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings.

PART 2 - PRODUCTS

2.01 RACEWAYS

- A. General: Provide conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) for each service indicated. Where types and grades are not indicated, provide proper selection determined by Installer to fulfill wiring requirements, and comply with applicable portions of NEC for raceways. Conduit shall be used where concealed in permanent wall construction or in ceiling plenums. See 26 0553 for color conduit requirements.
- B. Electrical Metallic Tubing (EMT):
 - 1. Thin wall, electrically welded cold rolled steel conduit, galvanized inside and out by electro galvanized process. Baked clear elastic enamel coating in and out. Product shall conform to UL-797 and ANSI C80.3.
 - 2. Fittings (couplings, conduit bodies, and connectors):
 - a. NEMA FB I, UL 514B; steel, watertight gland compression type connectors with double locknuts and insulated throat.
 - b. NEMA FB I, UL 514B; steel, set screw type connectors with double locknuts and insulated throat.
 - c. Conduit bodies cover: stamped steel, with stainless steel screws and neoprene gaskets.
 - d. Indentor, drive-on, die-cast or pressure cast fittings are not permitted.
- C. Flexible Metal Conduit (FMC):
 - 1. Formed of one continuous length of spirally wound electro galvanized steel strip. Product shall conform to ANSI/UL-1 for Flexible Metal Conduit.
 - 2. Fittings: NEMA FB I, UL 514B; 3/4" – 2" trade size: Die-Cast Zinc; Above 2" trade size: Zinc-Plated Malleable Iron. Insulated throat.
- D. Liquidtight Flexible Metal Conduit (LFMC):
 - 1. Formed of one continuous length of spirally wound steel strip, with water and oil tight neoprene jacket. Product shall conform to ANSI/UL-360 for Liquidtight Flexible Steel Conduit.
 - 2. Fittings: NEMA FB 1, UL 514B; steel. Insulated throat.
- E. Type MC Cable: Type MC cable meets or exceeds all applicable ASTM Specifications, UL Standard for Safety 1569, UL Standard for Safety 1581, UL Standard for Safety 83, Federal Specification A-A-59544 and requirements of the National Electrical Code (NFPA 70).
 - 1. Type MC cable is constructed with copper conductors that are soft annealed copper, insulated with heat and moisture resistant lead-free polyvinyl chloride (PVC) over which a nylon (polyamide) or UL listed equivalent jacket is applied (Type THHN and THWN). The assembly is wrapped with polypropylene tape and covered with interlocking aluminum armor.

2. Cable shall be UL listed type MC, suitable for operation at 600 volts in all installations as specified by the National Electrical Code.
3. MC cable shall contain a copper equipment ground conductor equal in size with the branch circuit conductors, with green insulation.

2.02 SURFACE METAL RACEWAY

- A. Provide surface metal raceways of sizes and channels indicated on plans and constructed of steel or aluminum with covers. Finish with manufacturer's standard baked on enamel paint or exposed metal as scheduled on drawings.
- B. Provide all components including raceway, adaptors, low-voltage dividers, boxes, and fittings for a complete installation.
 1. Manufacturer: Subject to compliance with requirements, the following manufacturers are acceptable:
 - a. Wiremold (basis of design)
 - b. Hubbell

2.03 WALL OUTLET BOXES

- A. General: Boxes shall be Racor, Steel City, Appleton or equal, catalog numbers based on Racor, unless otherwise indicated. In general, the type of boxes shall be as follows:
 1. In Stud Walls: For single outlet use 4" square by 2-1/8" deep box. Boxes to be provided with raised covers of depth as required for thickness of wall materials.
 2. In Masonry and Poured Concrete Walls: Use 3 3/4" high by 2 1/2" and/or 3 1/2" deep masonry boxes #691 through #694 and/or #695 through #699.
 3. Surface Mounted Wall Outlets for conduit: Use 4" square by 1 1/2" deep box #192 with raised cover.
 4. Surface Mounted Wall Outlets for surface metal raceway: Use single gang boxes 1-1/2" deep Wiremold #V57xx series.
 5. Suspended Ceiling: Use octagon boxes, depth as required for application, securely fastened to structure.

2.04 ACTIVATION BOXES

- A. Activation Boxes: Provide boxes as scheduled on the drawings.
- B. Activation boxes shall be provided with barriers to separate high and low potential voltages.
- C. Activation box shall maintain the fire rating of the floor or wall in which it is installed.
- D. Activation boxes shall be complete with necessary gaskets, plates, spacers, mud caps, covers, fasteners, brackets and ancillary components appropriate for their installation. Follow the manufacturer's specific written instructions for each type of installation.
- E. For wall activation boxes, coordinate elevation with other trades such that the box is concealed behind the wall mounted display and does not interfere with the mounting system of the monitor.
- F. For wall and floor activation boxes, coordinate exact placement with Architectural details prior to rough-in; dimensions shall not be scaled from electrical drawings.
- G. Wall and floor activation boxes shall maintain the fire rating of the wall or floor in which they are installed.
- H. Furnish electrical outlets with duplex receptacles per specification Section 26 2726 – Wiring Devices.
- I. Manufacturers: Subject to compliance with requirements, the following manufacturers are acceptable:
 1. Wiremold/Legrand/Chief
 2. FSR Inc.
 3. Hubbell
 4. Steel City

2.05 PULL BOXES, AND JUNCTION BOXES

- A. Construction, sizes and installation of pull boxes and junction boxes shall comply with NEC, Article 314.
- B. Pull and junction boxes not specifically described in NEC, Article 314, shall be fabricated of heavy gauge galvanized steel with screw or hinged covers, and equipped with corrosion resistant screws and hardware.
- C. Pull boxes and junction boxes for outdoor installation shall be raintight.

2.06 METAL WIREWAYS

- A. Construction, sizes, and installation of metal wireways shall comply with NEC, Article 376.
- B. General: Provide electrical raceways of types, grades, sizes and weights (wall thicknesses), number of channels, for each type of gutter indicated. Provide complete assembly of raceway including, but not necessarily limited to, couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other components and accessories as needed for the complete system. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements, and comply with applicable provisions of NEC for electrical raceways.
- C. Wireways shall be constructed as a complete assembly of raceway including, but not necessarily limited to, couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, and other components and accessories as needed for complete system. Gutters shall have hinged covers. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements.
- D. Wireways shall have hinged covers unless noted otherwise.

PART 3 - EXECUTION

3.01 RACEWAY APPLICATION

- A. Raceway uses permitted and not permitted per NFPA 70 requirements and as described below.
- B. Electrical Metal Conduit (EMT)
 - 1. Concealed in interior partitions
 - 2. Above suspended ceilings
 - 3. Exposed in mechanical rooms, electrical rooms, custodial closets and similar unfinished utility spaces where not subject to severe physical damage.
 - 4. Exposed, exterior locations not subject to physical damage.
- C. Flexible Metal Conduit (FMC)
 - 1. Final connections from junction box to recessed luminaires. Lengths not to exceed 6'. Not to be used from light fixture to light fixture.
 - 2. Within door frames and casework.
- D. Liquidtight Flexible Metal Conduit (LFMC)
 - 1. Final connections to vibrating equipment including transformers, light fixtures, and motor driven equipment in wet locations including all exterior locations. To be used for all pumps.
- E. Type MC Cable
 - 1. Only allowed for light fixture connections to junction box. Length limited to 6'.
 - 2. Use for branch circuit wiring only in office areas above ceilings and concealed in stud and drywall partitions. MC cable is not to be used at any exposed locations, mechanical rooms, shop spaces, or in high bay spaces.
 - 3. Type MC cable is prohibited for feeders or branch circuits over 30 amps.
- F. Surface Metal Raceway
 - 1. Use in finished spaces on existing precast, masonry, and concrete walls.

3.02 INSTALLATION OF RACEWAY

- A. In general, all horizontal runs of branch circuit conduit shall be installed in ceiling plenum. Raceway for convenience outlets, wall mounted fixtures and other wall outlets shall be routed overhead and dropped through wall to the outlet.
- B. Branch circuit raceway shall not be installed in or below concrete floor slabs except where conditions will not permit the raceway to be installed overhead.
- C. Generally, all conduit shall be concealed, except in crawl spaces, tunnels, shafts, mechanical equipment rooms, and at connection to surface panels and free standing equipment, and as otherwise noted.
- D. Exposed conduit and conduit concealed in ceiling space shall be routed in lines parallel to building construction.
- E. All conduit runs above suspended acoustic ceilings shall be routed so as not to interfere with tile panel removals with 4'0" to 6'0" flexible conduit drops from an independent junction box, accessible from below the ceiling, to ceiling mounted equipment.
- F. Minimum raceway size:
 - 1. Minimum size conduit shall be 3/4" trade size. Minimum size surface raceway shall be V700. Where specified size is not called for on drawings or in the specifications, conduit shall be sized per NEC.
 - 2. FMC connections from junction box to light fixture may be 1/2" trade size.
- G. Use approved thread lubricant for rigid steel and aluminum conduits to ensure equipment grounding paths.
- H. Use approved thread sealant for all underground and wet locations threaded conduit joints.
- I. Install the conduit system mechanically and electrically continuous from outlet to outlet and to all cabinets, junction or pull boxes. Conduit shall enter and be secured to all cabinets and boxes in such a manner that all parts of the system will have electrical continuity.
- J. PVC conduit shall not be installed above grade unless noted otherwise.
- K. Support conduit raceway systems in accordance with requirements as set forth in the National Electric Code.
- L. All connections to NEMA 3R enclosures shall maintain the enclosure listing regardless of the equipment location.
- M. For any location where a temperature differential exists (i.e. conditioned spaces to non-conditioned spaces), interiors of conduits shall be sealed with duct seal. Seal material shall be removeable.

3.03 INSTALLATION OF BOXES AND FITTINGS

- A. Install electrical boxes and fittings where indicated, complying with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
- B. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.

3.04 OUTLET BOX INSTALLATION

- A. Outlet boxes shall be installed for all fixtures, switches, receptacles and other devices.
- B. Approximate locations of outlets are shown on the plans, but each outlet location as shown shall be checked by Contractor before installing the outlet box.
- C. Wall boxes installed flush in common wall shall not be back-to-back or through wall type. Boxes located on opposite sides of a common wall that are closely connected by conduit shall have the conduit openings plugged with duct seal.
- D. Install boxes and conduit bodies in those locations to ensure ready accessibility of electrical wiring.

- E. Outlet boxes shall be installed plumb and square with wall face and with front of box or cover located within 1/8" of face of finish wall. Boxes in masonry shall be set with bottom or top of the box tight to the masonry unit.
- F. Contractor shall verify recessed box mud ring extension depth with architectural wall construction and finishes.
- G. Outlet box installation shall maintain the fire rating of the wall in which they are installed. Install listed putty pads per UL requirements.

3.05 PULL BOX, JUNCTION BOX & WIREWAY INSTALLATION

- A. Install pull boxes, junction boxes and auxiliary wiring gutters where indicated on drawings and where required to facilitate installation of the wiring.
- B. For concealed conduit, install boxes flush with ceiling or wall, with covers accessible and easily removable. Where flush boxes are installed in finish ceilings or walls, provide cover which shall exceed the box face dimensions by a sufficient amount to allow no gap between box and finished material.
- C. Boxes shall not be located in finished, occupied rooms, without prior approval of Design Professional.

3.06 ACTIVATION BOX INSTALLATION

- A. Install activation boxes flush with surrounding wall or floor surface, factor in lids and covers in addition to wall/floor finishes when setting boxes.
- B. Coordinate raceway into boxes with Telecom and AV Contractors to limit the number of bends and entry into appropriate sides of boxes.
- C. Coordinate exact placement of boxes with Architectural details, do not scale drawings for locations.
- D. All floor activation boxes within the same area shall be oriented in the same direction.

3.07 COMMUNICATIONS RACEWAY INSTALLATION

- A. The term "Communications" includes all low voltage technology systems including voice and data, access control, video surveillance, intrusion detection, audio video, induction loop, paging, intercom, nurse call, school bell and/or clock systems. The term does not include fire alarm system, which is addressed separately in the plans and specifications.
- B. Contractor shall furnish and install Communications boxes and conduits, including wall sleeves unless otherwise noted. Provide dedicated sleeves for each of the following systems unless a consolidated pathway(s) system is provided and filled to less than 40% capacity after all cables are installed:
 - 1. Data and voice
 - 2. Audio Visual
 - 3. Paging, intercom, school bell, clock system
 - 4. Emergency two-way communication
 - 5. All other life safety or security systems that are not fire alarm or not already listed.
- C. Interior Installations:
 - 1. Interior building, above grade conduits and sleeves shall be EMT unless otherwise noted. PVC is never acceptable above grade.
 - 2. All interior conduits shall have bushings installed during conduit installation.
 - 3. All conduit sleeves shall have bushings installed at both ends during sleeve installation.
 - 4. All interior conduits shall have pull strings, except sleeves which are less than 4' long. EMT conduits shall receive standard round cable pull string (multi-strand plastic twine type).
 - 5. Minimum interior conduit size for all information jacks (voice data cabling) shall be 1" unless otherwise noted.
 - 6. Minimum interior conduit size for audiovisual systems shall be 1" unless otherwise noted.
 - 7. Minimum interior conduit size for paging, intercom, and/or alerting systems shall be 1" unless otherwise noted.

8. Boxes for all low voltage systems in stud walls shall be metallic 5"x5"x2.875" with single gang mud ring unless otherwise noted.
9. Boxes in masonry walls shall be minimum 3.5" deep. single gang, unless otherwise noted.
10. Wiremold surface raceway for all low voltage systems shall be minimum V2400 unless noted otherwise.
11. Wiremold surface boxes for all low voltage shall be minimum 2.5" deep single gang, unless otherwise noted.
12. Conduits inside walls which feed the low voltage side of dual compartment Wiremold shall be minimum 1.25" unless otherwise noted.
13. Install conduit pathways per ANSI TIA-569 for all technology systems.
 - a. No section of conduit shall contain more than two (2) 90 degree bends, or equivalent, between pull points. e.g., outlet boxes, pull boxes, distribution rooms.
 - b. A pull box shall be placed in a conduit run where:
 - 1) The length is over 100 ft.
 - 2) There are more than two 90 degree bends or equivalent.
 - 3) There is a reverse U-shaped bend in the conduit run.
14. Pull boxes shall be placed in a straight section of conduit.
15. Pull boxes shall not be used in place of a bend. The corresponding conduit ends should be aligned with each other.
16. A pull box shall be accessible.
17. A pull box shall not be placed in an inaccessible ceiling space unless immediately above a suitable marked access panel.
18. Conduit body fittings e.g., LB or LC fittings are not considered pull boxes and shall not be used where a pull box is required per ANSI or unless noted otherwise.

END OF SECTION 26 05 33

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall provide identification for wiring systems and equipment as called for in this section.
- B. Types of electrical identification specified in this section include the following:
 - 1. Conduit color banding.
 - 2. Cable conductor identification.
 - 3. Equipment/system identification signs.

1.03 QUALITY ASSURANCE

- A. UL Compliance: Comply with applicable portions of UL safety standards pertaining to electrical marking and labeling identification systems.
- B. NEC Compliance: Comply with NEC as applicable to installation of identifying labels and markers for wiring and equipment.

PART 2 - PRODUCTS

2.01 ELECTRICAL IDENTIFICATION MATERIALS

- A. General: Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option, but provide single selection for each application.
- B. Color Coded Conduit System
 - 1. General: Provide manufacturer's standard colored conduit for EMT installations as noted below. For rigid aluminum, rigid steel, and IMC conduit, use colored electrical tape to band conduits within 6" of termination at each switchboard, panelboard, distribution board, pull box and junction box. Where conduit is exposed and painted to match adjacent surfaces, band with colored electrical tape.
 - 2. Colors:
 - a. Normal Power: gray/silver (uncolored)
 - b. Emergency yellow*
 - c. Fire alarm: red*
 - d. Division 27 systems: purple**
 - e. Division 28 systems excluding fire alarm: purple**
 - * Factory colored conduit required for EMT conduit
 - ** Field applied electrical tape banding at conduit terminations required. Factory colored conduit optional for EMT conduit.
 - 3. For exposed conduits in finished spaces, refer to architectural for paint to match room finish.
 - 4. For branch circuits, mark panel name and circuit numbers on all junction/pull boxes.
- C. Cable/Conductor Identification Bands
 - 1. General: Provide manufacturer's standard vinyl cloth self-adhesive cable/conductor markers of wrap around type; either pre numbered plastic-coated type or write on type with clear plastic self-adhesive cover flap; numbered to show circuit identification.
- D. Self-Adhesive Tape for Receptacle Circuit Identification
 - 1. General: Provide clear self-adhesive or pressure sensitive, preprinted, flexible vinyl tape for panel name and circuit number.

- E. Engraved Plastic Laminate Signs
 - 1. General: Provide engraving stock melamine plastic laminate, in sizes and thickness indicated, engraved with engraver's standard letter style of sizes and wording indicated, black and white core (letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
 - a. Thickness: 1/16", for units up to 20 sq. in. or 8" lengths; 1/8" for larger units.
 - b. Fasteners: Self tapping stainless steel screws, except contact type permanent adhesive where screws cannot or should not penetrate substrate.

PART 3 - EXECUTION

3.01 APPLICATION AND INSTALLATION

- A. General Installation Requirements
 - 1. Coordination: Where identification is to be applied to surfaces which require finish, install identification after completion of painting.
- B. Conduit Identification
 - 1. Conduit above accessible ceiling spaces shall be identified per 2.01 B.
 - 2. Where electrical conduit is exposed in spaces with exposed mechanical piping which is identified by a color coded method, apply color coded identification on electrical conduit in a manner similar to piping identification.
 - 3. Identify junction and pullboxes of systems with stencil lettering for panel and circuit numbers or system type.
- C. Cable/Conductor Identification
 - 1. General: Apply cable/conductor identification on each cable and conductor in each box/enclosure/cabinet where wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided. Match identification with marking system used in panelboards, shop drawings, contract documents and similar previously established identification for project electrical work.
- D. Equipment/System Identification
 - 1. General: Install engraved plastic laminate sign on each major unit of electrical equipment in building; including central or master unit of each electrical system, unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, 1/2" high lettering on 1 1/2" high sign (2" high where 2 lines are required), white lettering in black field. Provide text matching terminology and numbering of the contract documents and shop drawings. Provide signs for each unit of the following categories of electrical work.
 - a. Panelboards, electrical cabinets and enclosures.
 - 2. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrate.
 - 3. Provide labeling of Enclosed Circuit Breakers, Switchboards, Panelboards and Disconnects per NEC Articles 110, 700 and 702 for multiple services and essential electrical system.
 - 4. All receptacles shall be labeled with panel and circuit number. Final location of label shall be field coordinated. If labeling is to be on outside of cover, Contractor shall use clear dyno-tape with black lettering that matches other tags.
 - 5. All panelboards shall be labeled with panel ID, conduit size, feeder wire size, origin and size of overcurrent protection device serving panelboard and phase schedule. Format shall be as follows:
"Panel XX, 1.25"C, 4#3, 1#8, Fed from Dist. Bd. XX by 100A/3P
Phase A: Black, Phase B: Red, Phase C: Blue, Neutral: White"

END OF SECTION 26 05 53

SECTION 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Contractor shall furnish all equipment, materials, tools, labor and supervision necessary to install lighting panelboards and distribution panelboards as specified in this section and as called for on the drawings.
- B. Types of panelboards and enclosures in this section include the following:
 - 1. Lighting and appliance panelboards.
 - 2. Power distribution panelboards.

1.03 QUALITY ASSURANCE

- A. Compliance: Comply with applicable UL safety standards pertaining to panelboards and accessories, and enclosures; provide units which have been UL listed and labeled.
- B. NEC Compliance: Comply with NEC as applicable to installation of panelboards, cabinets and cutout boxes.
- C. NEMA Compliance: Comply with NEMA Stds. Pub. No. 250, "Enclosures for Electrical Equipment (1000 volt maximum)", Pub. No. 1, "Panelboards", and installation portion of Pub. No. PB 1.1, "Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less".

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product Data - provide one submittal containing the following information:
 - 1. Manufacturer's data including specifications, installation instructions and general recommendations, for each type of panelboard required. Include data substantiating that units comply with requirements.
 - 2. Drawings: Submit dimensioned drawings of panelboards and enclosures showing accurately scaled layouts of enclosures and required individual panelboard devices, including but not necessarily limited to, circuit breakers, fusible switches, fuses, ground fault circuit interrupters and accessories.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings
 - b. Include manufacturer's maintenance information.
 - 2. Manufacturer's Warranty: Submit manufacturer's standard warranty document.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Schneider Electric/Square D (Basis of Design)
 - 2. ABB/GE Industrial Solutions
 - 3. Eaton
 - 4. Siemens

2.02 PANELBOARDS

- A. General: Except as otherwise indicated, provide panelboards, enclosures and components, of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design and construction in accordance with published product information; equip with number of unit panelboard devices as required for complete installation.
 - 1. All Multi-Section Panels: Same dimensions.
 - 2. Provide two keys for each panel.
 - 3. Provide copper ground bar.
 - 4. All panels shall have a designed short circuit rating label.
- B. Lighting and Appliance Panelboards:
 - 1. Panelboard bus structure and main lugs or main breakers shall have current ratings as shown on the panelboard schedule. Such ratings shall be established by heat rise tests, conducted in accordance with UL Standard 67. Bussing shall be distributed phase sequence type.
 - 2. The bus assembly shall be enclosed in a steel cabinet. Wiring gutter space shall be in accordance with UL Standard 67 for panelboards. The rigidity and gauge of steel to comply with UL Standard 50 cabinets. Provisions for additional circuit breakers shall be such that field addition to connectors or mounting hardware will not be required to add circuit breakers to the panelboards.
 - 3. If ground fault interrupting breakers (GFI), switched neutral or other special types of breakers require additional pole spaces, size of panel shall be increased accordingly to give the scheduled numbers of poles for spare breakers and blank spaces.
 - 4. Fronts shall include doors and have flush, stainless steel, cylinder tumbler type locks with catches and spring loaded door pulls. The flush lock shall not protrude beyond the front of the door. All panelboard locks shall be keyed alike. Fronts shall have adjustable indicating trim ring clamps which shall be completely concealed steel hinges. Fronts shall not be removable with door in the locked position. A circuitry directory frame and card with a clear plastic covering shall be provided on the inside of the door.
 - 5. Terminals for feeder conductors to the panelboard mains and neutral shall be UL listed as suitable for conductor specified.
 - 6. Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule. Series connected interrupting ratings are not acceptable. This short circuit current rating shall be established by testing with the overcurrent devices mounted on the panelboard. The short circuit tests on the overcurrent devices and on the panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. Method of testing shall be per Underwriters Laboratories Standard UL 67. The source shall be capable of applying the specified panelboard short circuit current or greater. Testing of panelboard overcurrent devices for short circuit rating only while individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.
 - 7. Provide (1) spare stub out for every (3) prepared spaces or spare circuit breakers in panelboard. Provide minimum of (1) 1.25"C and (4) 3/4"C for all flush mounted panelboards. Provide stub outs to accessible ceiling space and designate with label or endcap.
 - 8. Bus Bar: Aluminum or Copper.
 - 9. Panelboards shall have door-in-door covers.
- C. Power Distribution Panelboards; Circuit Breaker Type:
 - 1. Panelboards to be used for main circuit distribution and power circuit distribution shall be similar to lighting panelboards with the following additions:
 - a. Cabinet doors over 48" long shall be equipped with three point latch and vault lock. End walls shall be removable.

- b. Main lugs or main breakers shall be barriered on five sides. The barrier in front of the main lugs shall be hinged to a fixed part of the interior. The end of the bus structure opposite the mains shall be barriered.
 - c. When required, panelboards shall be suitable for use as service equipment.
 - d. Bus Bar: Copper.
- D. Power Distribution Panelboards, fusible type:
 - 1. Panelboards shall be dead front type, equipped with quick make, quick break fusible branch switches.
 - a. Panelboard bus structure and main lugs or main switch shall have current ratings as shown on the panelboard schedule. The bus structure shall accommodate plug on branch switches as indicated in the panelboard schedule without modifications to the bus assembly.
 - b. All fusible branch switches shall be quick make, quick break with visible blades and dual horsepower ratings. Switch handles shall physically indicate "ON" and "OFF" positions. Switches shall be lockable only in the "OFF" position and accept three industrial type heavy duty padlocks. Switch covers and handles shall be interlocked to prevent opening in the "ON" position. A means shall be provided to permit authorized personnel to release the interlock for inspection purposes. A circuit identification cardholder shall be provided for each branch switch.
 - c. Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the integrated equipment short circuit rating shown on the panelboard schedule or on the plans. Series connected interrupting ratings are not acceptable. This short circuit current rating shall be established by testing with the fusible switches mounted in the panelboard. Short circuit tests on the overcurrent devices and on the panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. Method of short circuit testing shall be per Underwriters Laboratories Standard UL 67. The source shall be capable of supplying the specified panelboard short circuit current or greater. Testing of panelboard overcurrent devices for short circuit rating only while individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Panelboards shall be marked with their maximum short circuit rating at the supply voltage and shall be UL listed.
 - d. Panelboards shall be UL listed for use on a system capable of delivering not more than 200,000 rms symmetrical amperes at 600 volts ac maximum when all branch switches are equipped with appropriately rated Class R, J, L or T fuses.
 - e. Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets. Wiring gutters shall be sized in accordance with UL Standard 67. Cabinets shall be equipped with a four piece front without door and have concealed, self adjusting trim clamps. Fronts shall be of full finished steel with rust inhibiting primer and baked enamel finish.
 - f. Bus Bar: Copper.
- E. Load Centers:
 - 1. Provide load center type panelboards as shown and scheduled on the drawings.
 - 2. Branch circuit breaker ratings shall be of size and number as indicated on drawings. Load centers shall be plug on type construction. All current carrying parts of the bus assembly shall be plated. Terminals for feeder conductors to main and branch neutral shall be UL listed as suitable for the type conductor specified. The load center bus assembly shall be enclosed in a steel cabinet. The size of the wiring gutters and gauge steel shall be in accordance with UL standards No. 67 for panelboards. Fronts shall include door and shall be provided with a directory for circuit identification. Load center boxes and fronts shall have rust resisting phosphate treatment and baked enamel finish.

3. All branch breakers shall be plug on type, toggle action with quick make, quick break mechanism. Trip indication shall be clearly shown by the breaker handle taking a position between ON and OFF when the breaker is tripped. All multi pole breakers shall be single operating handle, common trip variety.
4. Integrated Interrupting Rating: Series rating not allowed.

2.03 CIRCUIT BREAKERS

- A. General: Except as otherwise indicated, provide circuit breakers and ancillary components, of types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard design, materials, components, and construction in accordance with published product information, and as required for a complete installation.
- B. Circuit Breakers - Branch Circuit Panelboards:
 1. Branch circuit breakers up to 150 amperes shall be Square D Type QOB or equal. Breakers shall be bolt-on type toggle action with quick-make, quick-break mechanism. Trip indication shall be clearly shown by the breaker handle taking a position between on and off when the breaker is tripped. All multi-pole breakers shall be single-operated handle, internal common trip. Breakers having handle ties but not factory labeled "common trip" will be rejected. UL Class A ground fault circuit protection and arc fault protection shall be provided on 120V AC branch circuits as specified on the plans or panelboard schedule. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for branch circuit wiring. Single pole 15 and 20 ampere circuit breakers shall be UL listed as "Switching Breakers" at 120V AC and carry the SWD marking. Tandem or "piggyback" breakers providing two circuits from one pole space are prohibited.
- C. Circuit Breakers - Distribution Panelboards:
 1. General: Except as otherwise indicated, provide circuit breakers and ancillary components, of types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard design, materials, components, and construction in accordance with published product information, and as required for a complete installation.
 2. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with fully connected rating to meet available fault currents. No series rated devices.
 - a. Breakers 20A to 125A:
 - 1) Thermal magnetic trip.
 - b. Breakers 150A-225A: Electronic trip with true RMS sensing
 - 1) Adjustable long-time pick-up setting
 - 2) Adjustable long-time delay.
 - 3) Adjustable instantaneous trip settings.
 - 4) Adjustable short time pick-up settings with I²t delay.
 - 5) Ground fault pick-up & delay where ground fault protection is indicated.
 - 6) Local status indicator showing breaker status and trip log for last (5) trip events.
 - 7) Trip unit shall include real time metering for voltage, current, power and frequency.
 - c. Breakers 250A-700A: Electronic trip with true RMS sensing
 - 1) Adjustable long-time pick-up setting
 - 2) Adjustable long-time delay.
 - 3) Adjustable instantaneous trip settings.
 - 4) Adjustable short time pick-up settings with I²t delay.
 - 5) Ground fault pick-up & delay where ground fault protection is indicated.
 - 6) Local status indicator showing breaker status and trip log for last (5) trip events.
 - d. Trip unit shall include real time metering for voltage, current, power and frequency.

- 3) Adjustable instantaneous trip settings.
- 4) Adjustable short time pick-up settings with I²t delay.
- 5) Ground fault pick-up & delay where ground fault protection is indicated.
- 6) Local status indicator showing breaker status and trip log for last (5) trip events.
- 7) Breakers 1200A or larger shall be provided with an energy reduction maintenance switch.
- 8) Trip unit shall include real time metering for voltage, current, power and frequency.
- e. Refer to the equipment schedules for special provisions for select circuit breakers including variations of the requirements noted above, ground fault trip, ground fault alarm, shunt-trip, undervoltage trip, and zone selective interlocking.

2.04 FUSES

- A. General: Except as otherwise indicated, provide fuses of types, sizes, ratings, and average time/current and peak let-through current characteristics indicated, which comply with manufacturer's standard design, materials, and construction in accordance with published product information, and with industry standards and configurations.
- B. Main Service Feeders and Branch Circuits: For switch rating over 600 amperes: Hi-Cap, Type KRP-C with interrupting rating of 200,000 amperes RMS. For switch rating 600 amperes or less: Low peak current limiting fuses, Type LPN(S)-R, with interrupting rating of 200,000 amperes RMS.
- C. Motors Above One (1) Horsepower: For fuse rating 600 amperes or less, dual element time delay, Type FRN(S)-R, with interrupting rating of 200,000 amperes RMS. Size fuses per Article 430 of the National Electric Code.
- D. Motors One (1) Horsepower or Less: Single phase 150 volts or less, Fustat fuses for motor running protection sizes. Single phase or three phase over 150 volts, Fustron fuses for motor running protection, with interrupting rating of 100,000 RMS. Size fuses per Article 430 of the National Electric Code.
- E. Fuses for all feeders, branch circuits, motors and other equipment shall be selected in types and ratings in accordance with NEC to provide a coordinated system of overcurrent protection, thus in case of a fault or harmful overload, only the fuses nearest the fault or overload will open.
- F. Provide one spare set of three (3) of each size and type of fuse used on project.

2.05 SURGE PROTECTIVE DEVICE (SPD)

- A. SPD shall meet UL 1449, 4th Edition, Type 2 requirement.
- B. SPD shall be integral to the panelboard.
- C. SPD shall have a minimum surge current capacity of 120,000A per phase, 60,000A per mode.
- D. Provide 60A circuit breaker to connect SPD to bus.
- E. Panelboard SPD per section 26 43 13 – Surge Protective Devices.

PART 3 - EXECUTION

3.01 INSTALLATION OF PANELBOARDS

- A. General: Install panelboards and enclosures where indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
- B. Securely anchor panelboards to structure and make feeder and branch circuit connections as indicated in specifications and on the drawings.
- C. Each panelboard directory shall be typewritten to identify the load fed by each circuit. Spare breakers and circuits to be left blank with circuit breaker in off position.

END OF SECTION 26 24 16

SECTION 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 - Procurement and Contracting Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Provide materials, equipment, labor and supervision necessary to install wiring devices as required by the drawings and this section.
- B. Types of wiring devices this section include the following:
 - 1. Straight blade receptacles
 - 2. GFI receptacles
 - 3. AFCI receptacles
 - 4. Wall switches
 - 5. Wiring device accessories
 - 6. Wall box dimmers

1.03 QUALITY ASSURANCE

- A. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring devices.
- B. UL Compliance and Labeling: Provide electrical wiring devices which have been UL listed and labeled.
- C. NEMA Compliance: Comply with NEMA standards for general and specific purpose wiring devices.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product data: provide one submittal containing the following information:
 - 1. Manufacturer's catalog cuts showing complete descriptive data for each type of wiring device required.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data.
 - 2. Startup and test reports: Submit reports immediately upon completion of tests.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Hubbell, Inc.
 - 2. Leviton Manufacturing Co., Inc.
 - 3. Pass & Seymour / Legrand

2.02 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Device Color:
 - 1. Device color shall be selected by the architect at the time of submittal review.
 - 2. Device color may not be consistent throughout the building. Select areas may require special colors. Refer to Architectural elevations and finishes.
 - 3. Device model numbers indicated below to not include a color suffix. Model numbers listed do not indicate brown device color.

4. Where a device is shown connected to an emergency circuit, it shall have a "red" body.
- B. Modular Connectors: Devices that are manufactured for use with modular plug-in connectors (snap connect, plug tail, etc.) may be substituted. Plug in connectors shall meet the following conditions:
 1. Connectors shall comply with UL498 and shall be made with stranded building wire.
- C. Weather Resistant:
 1. Devices located at exterior and wet locations shall be weather resistant. Provide weather resistant versions of the model specified.
 2. Refer to Part 3 - Execution section for required locations.
- D. Controlled Receptacles:
 1. Where receptacles that are noted to be automatically controlled through the lighting control system, they shall be permanently marked "CONTROLLED" with the controlled symbol as defined in NFPA 70.
 2. For duplex receptacles, one or both outlets shall be permanently marked as noted.
- E. Isolated Ground Receptacles:
 1. Devices marked 'IG' shall be Isolated Ground type.
 - a. Receptacle shall be orange in color and marked with a triangle symbol on the receptacle face.

2.03 STRAIGHT BLADE RECEPTACLES

- A. Commercial Specification Grade Convenience Receptacles 125 V, 20 A, Tamper Resistant: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
 1. Hubbell HBL5361TR (simplex), BR20TR (duplex).
 2. Pass & Seymour 5361TR (simplex), CRB5362TR (duplex)
 3. Leviton 5361TR (simplex), BR20TR (duplex)

2.04 GFCI RECEPTACLES

- A. Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596. Configuration 5-20R. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection. Self-testing, 4 to 6mA trip. Hubbell is basis of design. Other manufacturers as listed above are acceptable.
 1. Heavy duty tamper resistant: Hubbell GFTRST20
 2. Heavy duty tamper resistant and weather resistant: Hubbell GFTWRST20
 3. Heavy duty faceless. Hubbell GFBFST20

2.05 AFCI RECEPTACLES

- A. Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 1699A, and FS W-C-596. Configuration 5-20R. Include indicator light that shows when the AFCI has malfunctioned and no longer provides proper arc fault protection. Self-testing. Combine AFCI GFCI functionality where indicated. Hubbell is basis of design. Other manufacturers as listed above are acceptable.
 1. Tamper resistant AFCI: Hubbell AFR20TR
 2. Faceless AFCI. Hubbell AFR20BF
 3. Tamper resistant combination GFCI and AFCI: Hubbell AFGF20TR

2.06 WALL SWITCHES

- A. Heavy duty industrial grade switch. Comply with NEMA WD 1, and FS W-S-896. Hubbell is basis of design. Other manufacturers as listed above are acceptable.
 1. Single pole toggle light switch 20 amp, 120 277 volt, Hubbell #1221 series.
 2. Three way toggle light switch 20 amp, 120 277 volt Hubbell #1223 series.
 3. Four way toggle light switch 20 amp, 120 277 volt, Hubbell #1224 series.

2.07 WIRING DEVICE ACCESSORIES

- A. Cover Plates:
 1. Smooth High-Impact Thermo plastic (nylon, unbreakable), Hubbell NP Series or equal.
 2. Plates for surface outlets shall be of the raised cover type utilizing 4" square boxes.

2.08 WALL BOX DIMMERS

- A. Acceptable Manufacturers:
 - 1. Lutron Electronics Co., Inc.
 - 2. Hubbell
 - 3. Lithonia
- B. 0-10v Dimmers: Provide single pole, three way or multi-location, semi conductor modular type 0-10 Volt dimmers for LED fixtures with 60 hertz, wattage and voltage as indicated, and with electromagnetic filters to reduce noise and interference to minimum. Construct with continuously adjustable trim potentiometer for adjustment of low end dimming.
 - 1. Lutron Nova T linear slide
 - 2. Lutron Diva
 - 3. Lutron Maestro

PART 3 - EXECUTION

3.01 INSTALLATION OF WIRING DEVICES

- A. Install wiring devices as indicated on the drawings and as called for below.
- B. 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.
- C. In masonry walls, switches and receptacle heights shall be adjusted as required so outlets are at nearest mortar joint to specified height.
- D. Where light switches are located adjacent to doors, they shall be installed on "knob" side of door, unless indicated otherwise.
- E. Switched duplex receptacles shall be wired so that only the top receptacle is switched; the remaining receptacle shall be unswitched.
- F. All GFI type receptacles shall be installed where GFI notation is shown on plans. No downstream protection of receptacles will be allowed from load side of other GFI type receptacles unless specifically noted on drawings.
- G. All GFI receptacles shall be accessible for testing. Where a GFI receptacle is located behind equipment, a faceless GFCI device shall be provided in an adjacent accessible location.
- H. All receptacles within 6' of the edge of a sink shall be GFI type, Contractor shall notify Engineer prior to installation if the drawings do not indicate these as GFI.
- I. Prior to roughing in outlet boxes, Contractor shall verify from general construction drawings, door swings, type of wall finishes and locations for counters and work benches.
- J. Receptacles shall be installed with ground terminal down. Horizontal receptacles shall be installed with the grounded (neutral) terminal up.
- K. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.

END OF SECTION 26 27 26

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SECTION 26 50 00
LIGHTING

PART 1 - GENERAL

1.01 RELATED WORK

- A. The requirements of Division 00 – Procurement, Contracting and Warranty Requirements, Division 01 - General Requirements and Section 26 00 10 - Electrical General Provisions are applicable to work required of this section.

1.02 DESCRIPTION OF WORK

- A. Provide lighting fixtures, accessories, labor and supervision necessary to install complete lighting system as required by the drawings and this section.
- B. Types of lighting fixtures in this section include the following:
 - 1. Solid State (LED)

1.03 QUALITY ASSURANCE

- A. NEC Compliance: Comply with NEC as applicable to installation and construction in building lighting fixtures.
- B. NEMA Compliance: Comply with applicable requirements of NEMA standard publications pertaining to lighting equipment.
- C. Listings: Provide lighting fixtures which have been listed and labeled. Listing or labeling shall be by UL, ETL Intertek or other nationally recognized agency.

1.04 SUBMITTALS

- A. Refer to Division 01 Submittal requirements.
- B. Product data: provide one submittal containing the following information:
 - 1. Manufacturer's data on interior and exterior lighting fixtures.
 - 2. Drawings: Submit fixture drawings in pdf form with separate sheet(s) for each fixture type arranged in alphabetical order. Include proposed options and accessories clearly indicated on each sheet.
 - a. Submittal shall indicate the specific lumen output and power consumption for each fixture type.
 - b. For fixtures requiring field assembly provide factory generated shop drawings indicating feed points, joint locations, and assembly instructions.
 - c. Include driver product data for each fixture type.
 - d. The pdf shall be book-marked by the fixture type. Submittal that is not bookmarked will be returned without review.

1.05 CLOSEOUT DOCUMENTS

- A. Refer to Division 01 Closeout requirements.
- B. Provide closeout items containing the following:
 - 1. Operation and Maintenance Manual:
 - a. Include approved Product Data and Drawings.
 - b. Include manufacturer's maintenance information.
 - c. Operation and Maintenance Data: Include detailed information on device programming and setup.
 - 2. Startup and test reports: Submit reports immediately upon completion of tests.
 - 3. Manufacturer's Warranty: Submit manufacturers standard warranty document.
 - 4. Spare Parts.

1.06 WARRANTY

- A. Fixtures shall be guaranteed to be free from original defects in both material and workmanship for a period of five (5) years. This warranty shall become effective starting the date of project substantial completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers shall be as listed in the light fixture schedule on the drawings.
- B. Basis of Design Product: The design for each luminaire is based on the product named and described in the light fixture schedule on the drawings. Provide either the named product or a comparable product by one of the equivalent manufacturers listed. Equivalent manufacturers shall match the basis of design product in both form and function. The Architect and Engineer have the final acceptance of equivalent products. Where equivalent products are not determined to match the basis of design, the basis of design product shall be provided at no additional cost to the Owner. Upon request, equivalent manufacturers shall submit lighting calculations and ies files to prove performance of product and samples for table top viewing.

2.02 SOLID STATE LIGHTING / LIGHT EMITTING DIODE (LED) LUMINAIRES

- A. General:
 - 1. Luminaire manufacturer shall have a minimum of five (5) years' experience in the manufacture and design of LED products and systems.
 - 2. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers.
- B. LED Warranty
 - 1. Luminaire manufacturer provide a five (5) year written warranty, warranty shall start upon project substantial completion.
- C. Replacement and Spares:
 - 1. Manufacturer shall provide written guarantee of the following:
 - a. Manufacturer shall be able to provide compatible replacement parts that are designed to fit into original luminaire for ten (10) years.
 - b. Replacement LED array/module shall be within 3 MacAdam color ellipse, within 10% of lumen output, 7% of correlated color temperature (CCT) and equivalent distribution of original array/module.
 - c. Replacement LED array/module shall utilize equal to or less than amount of wattage of original array/module.
 - 2. LED driver and array/module shall be replaceable in field.
- D. Products and Components – Performance:
 - 1. All LED components shall be mercury-free and lead-free.
 - 2. LEDs shall comply with ANSI/NEMA/ANSI C78.377-2008 – Specifications for the Chromaticity of Solid State Lighting Products. Color shall remain stable throughout the life of the light source.
 - 3. LEDs shall comply with IESNA LM-80 – Standards for Lumen Maintenance of LED Lighting Products.
 - 4. LEDs shall have a minimum rated source life of 50,000 hours under normal operating conditions or as noted on the lighting fixture schedule. LED “rated source life” is defined as the time when a minimum of 70% of initial lumen output remains, as defined by IESNA LM-70.
 - 5. Luminaire assembly shall include a method of dissipating heat so as to not degrade life of source, electronic equipment, or lenses. LED luminaire housing shall be designed to transfer heat from the LED board to the outside environment. Luminaire housing shall have no negative impact on life of components. Upon request, manufacturer shall provide junction temperature limitations and test reports of installed LED in fixture.
 - 6. Method of dissipating heat shall be passive, active cooling systems are not allowed.
 - 7. High power LED luminaires shall be thermally protected using one or more of the following thermal management techniques: metal core board, gap pad, and/or internal monitoring firmware.
 - 8. LEDs shall be adequately protected from moisture or dust in interior applications.

9. For wet and damp use, LED-based luminaires themselves shall be sealed, rated, and tested for appropriate environmental conditions, not accomplished by using an additional housing or enclosure. Such protection shall have no negative impact on rated life of source or components, or if so, such reductions shall be explicitly brought to the attention of the designer.
 10. All hardwired connections to LED luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
 11. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas) chromaticity coordinates, CCT and CRI. Optical performance, polar diagrams, and relevant luminance and illuminance photometric data. Provide data in IES file format in accordance with IES LM-79-2008, based on test results from an independent Nationally Recognized Testing Laboratory. Provide information upon special request.
- E. LED drivers shall meet the following requirements:
1. Drivers shall have a minimum efficiency of 85%.
 2. Minimum/Maximum Ambient Temperature: -20°C/55°C interior locations, -40°C/55°C exterior locations,
 3. Input Voltage: 120 to 277 (±10%) V or as scheduled.
 4. Power Supplies: Class I or II output.
 5. Dimming Type: 0-10V control with current source driver, current sinking drivers are not allowed.
 6. Surge Protection for exterior fixtures: The system must survive 250 repetitive strikes of "C Low" (C Low: 6kV/1.2 x 50 µs, 10kA/8 x 20 µs) waveforms at 1-minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ANSI C62.41.2-2002, Scenario 1 Location Category C.
 7. Power Factor (PF): ≥ 0.90.
 8. Total Harmonic Distortion (THD): ≤ 20%.
 9. Comply with FCC Title 47 CFR Part 18 Non-consumer RFI/EMI Standards.
 10. Drivers shall be reduction of hazardous substances (ROHS)-compliant.
 11. Mean Time Between Failure (MTBF): 100,000 hours based on 90% survival.

PART 3 - EXECUTION

3.01 INSTALLATION OF INTERIOR LIGHTING FIXTURES

- A. Install interior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of the National Electric Code (NEC), NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.
- B. All low-voltage luminaires using remote drivers or power supplies shall be installed as follows:
 1. Installation shall be in compliance with the manufacturer's instructions including distance limitations.
 2. Remote drivers and power supplies shall be located in accessible locations and clearly noted on as-built plans. Where plywood is used for power supply mounting, plywood shall be UL Listed fire resistant.
 3. Unless specifically noted "Class 2", all low-voltage wiring between remote drivers or power supplies and luminaires shall be considered Class 1 and installed in accordance with NEC Article 725. Wiring shall be 600V rated and installed in conduit.
 4. All remote drivers and power supplies not specifically labeled "Class 2" on the power supply housing shall be installed in a ventilated metal enclosure. Where the power supply includes cooling fan or convection cooling, ventilation openings in enclosure shall be provided to not impede power supply cooling.
- C. Coordinate with other electrical work as appropriate to properly interface installation of interior lighting fixtures with other work.
- D. Coordinate fixture location with reflected ceiling plan.

- E. Recessed fixtures in removable ceilings shall be connected to the branch circuit with flexible conduit and branch circuit wire from an accessible junction box. Where fluorescent fixture housings are connected together, use 90 deg.C wire for branch circuit feed through fixture channels.
- F. All fixtures shall be grounded. All lamp sockets shall be wired so that the outer shell is connected to the neutral grounded conductor.
- G. Fixtures recessed in furred ceiling shall be installed so that they can be removed from below the ceiling.
- H. Luminaires located in suspended ceilings shall be connected with a maximum 6 foot length of flexible metal conduit and building wire.
- I. Housing, trim, and lens frame shall be true, straight and parallel to each adjacent fixtures and features.
- J. Contractor shall include all materials and labor necessary for the final aiming and adjusting of adjustable light fixtures. Adjustment of light fixtures may be required to occur after sunset at a time designated by the Engineer.
- K. Round fixtures or fixtures smaller than the ceiling grid shall have at least two (2) 3/4 inch (19 mm) metal channels spanning, and secured to, the ceiling tees for centering and aligning the fixture.
- L. Troffer, recessed and semi-recessed fixtures shall be installed at a minimum per the manufacturer's instructions and the requirements below. Fixtures shall not be supported directly on the ceiling material. Support fixtures with metal bar hangers or strut channels attached to the ceiling tees. Coordinate with Ceiling Contractor to ensure ceiling tees can support the weight of the light fixtures.
- M. Suspended Linear or Pendant mounted fixtures shall be independently supported from the building structure by wires, straps or rods.
- N. Fixture whips shall be in accordance with section 26 05 33 Raceway and Boxes for Electrical Systems.

END OF SECTION 26 50 00