#9
b&c

WOODBURY COUNTY BOARD OF SUPERVISORS AGENDA ITEM(S) REQUEST FORM

Date: 7/18/2019 Weekly Agenda Date: 7/23/2019

ELECTED OFFICIAL / DEPARTMENT HEAD / CITIZEN: Kenny Schmitz

WORDING FOR AGENDA ITEM:

Trosper Hoyt Juvenile Detention Kitchen Project- Approval of plans, specifications, form of contract for bid, & set public hearing date.

ACTION REQUIRED:

Approve Ordinance ☐	Approve Resolution ☐	Approve Motion ☑
Public Hearing ☐	Other: Informational ☐	Attachments ☑

EXECUTIVE SUMMARY:

Form of contract, plans, and specifications to be utilized in the competitive bid process have been completed.

BACKGROUND:

June 12th, 2018- Board of Supervisors approves Trosper Hoyt Kitchen Project and authorization to seek bids.

June 6th, 2018- the Juvenile Detention Director recommends to the Woodbury County Board of Supervisors that upgrades planned for the Juvenile Detention area at Trosper Hoyt building by the previous director should be altered to shift project upgrade priorities.

December 5th,2017- Board of Supervisors approves plans & specifications to seek bids for the Trosper Hoyt Master Control System & Elevator Project.

August 22nd, 2017- Project low bid exceeds estimates by $97,000.00 in part do to the elimination of synergies anticipated by simultaneous door replacements with an LEC Project that was terminated. Trosper Hoyt Master Control & Door Project terminated (bids thrown out). Facility Project scope to be totally redesigned and new project bid.

January 25, 2017- Approval to Seek Competitive Bids for Master Control & Detention Doors Project.

January 17th, 2017- Board of Supervisors approves contract with Goldburg Group Architects for Juvenile Detention design related to; Trosper Hoyt Juvenile Detention Facility Master Plan, Master Control System Replacement, Partial Door Replacements, and Security Hardware.

FINANCIAL IMPACT:

2019 CIP ($160,000)- Project #9103-19-Kitchen
Project Estimate (Prior to Bid)- $160,000

IF THERE IS A CONTRACT INVOLVED IN THE AGENDA ITEM, HAS THE CONTRACT BEEN SUBMITTED AT LEAST ONE WEEK PRIOR AND ANSWERED WITH A REVIEW BY THE COUNTY ATTORNEY'S OFFICE?

Yes ☑ **No** ☐

RECOMMENDATION:

Building Services requests approval of form of contract, plans, specifications to be utilized in competitive bid process & to set a public hearing date.

ACTION REQUIRED / PROPOSED MOTION:

A. Motion to approve Trosper Hoyt Juvenile Detention Kitchen Project form of contract, plans, & specifications for bid purposes.
B. Motion to set public hearing date for the Trosper Hoyt Juvenile Detention Kitchen Project for August 13th, 2019, 4:45 pm Woodbury County Courthouse.

Approved by Board of Supervisors April 5, 2016.

DRAFT

AIA® Document A105™ – 2017

Standard Short Form of Agreement Between Owner and Contractor as Amended

AGREEMENT made as of the « » day of « August » in the year «2019 »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«Woodbury County, IA and/or Board of Supervisors»« »
«Woodbury County Courthouse»
«620 Douglas Street»
«Sioux City, IA 51101»

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

«Woodbury County Juvenile Detention Center: Kitchen & Laundry Renovations»
822 Douglas Street
Sioux City, IA 51101

- «Renovation of the existing Woodbury County Juvenile Detention Center.»

The Architect:
(Name, legal status, address and other information)

«Goldberg Group Architects, P.C.»« »
«805 N. 36th Street, Suite B»
«St. Joseph, Missouri 64506»

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contractor shall complete the Work described in the Contract Documents for the Project. The Contract Documents consist of

.1 this Agreement signed by the Owner and Contractor;

.2 the drawings and specifications prepared by the Architect, dated « », and enumerated as follows:

Drawings:

Number	Title	Date

Specifications:

Section	Title	Pages

.3 addenda prepared by the Architect as follows:

Number	Date	Pages

.4 written orders for changes in the Work, pursuant to Article 10, issued after execution of this Agreement; and

.5 other documents, if any, identified as follows:

« »

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The Contract Time is the number of calendar days available to the Contractor to substantially complete the Work.

§ 2.2 Date of Commencement:
Unless otherwise set forth below, the date of commencement shall be the date of this Agreement.
(Insert the date of commencement if other than the date of this Agreement.)

« A date set forth in a notice to procced issued by the Owner»

§ 2.3 Substantial Completion:
Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion, as defined in Section 12.5, of the entire Work:
(Check the appropriate box and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement.

[« »] By the following date: « »

ARTICLE 3 CONTRACT SUM

§ 3.1 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work. Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

«Zero Dollars and Zero Cents» ($ «0.00»)

§ 3.2 For purposes of payment, the Contract Sum includes the following values related to portions of the Work:
(Itemize the Contract Sum among the major portions of the Work.)

Portion of the Work	Value

§ 3.3 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner:
(Identify the accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

« »

§ 3.4 Allowances, if any, included in the Contract Sum are as follows:
(Identify each allowance.)

Item	Price

§ 3.5 Unit prices, if any, are as follows:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit ($0.00)

ARTICLE 4 PAYMENTS

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12, as follows:

(Insert below timing for payments and provisions for withholding retainage, if any.)

« »

§ 4.2 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate below, or in the absence thereof, at the legal rate prevailing at the place of the Project.
(Insert rate of interest agreed upon, if any.)

« » % « »

ARTICLE 5 INSURANCE

§ 5.1 The Contractor shall maintain the following types and limits of insurance until the expiration of the period for correction of Work as set forth in Section 14.2, subject to the terms and conditions set forth in this Section 5.1:

§ 5.1.1 Commercial General Liability insurance for the Project, written on an occurrence form, with policy limits of not less than $1,000,000 ($1,000,000) each occurrence, «$500,000 » ($500,000) general aggregate, and $500,000» ($500,000») aggregate for products-completed operations hazard.

§ 5.1.2 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than $300,000 ($ 300,000) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance, and use of those motor vehicles along with any other statutorily required automobile coverage.

§ 5.1.3 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided that such primary and excess or umbrella insurance policies result in the same or greater coverage as those required under Section 5.1.1 and 5.1.2, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ 5.1.4 Workers' Compensation at statutory limits.

§ 5.1.5 Employers' Liability with policy limits not less than «$1,000,000 ($ 1,000,000) each accident, «$100,000 ($ $100,000) each employee, and $1,000,000 ($ 1,000,000) policy limit.

§ 5.1.6 The Contractor shall provide builder's risk insurance to cover the total value of the entire Project on a replacement cost basis.

§ 5.1.7 Other Insurance Provided by the Contractor
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits

§ 5.2 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance and shall provide property insurance to cover the value of the Owner's property. The Contractor is entitled to receive an increase in the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance.

§ 5.3 The Contractor shall obtain an endorsement to its Commercial General Liability insurance policy to provide coverage for the Contractor's obligations under Section 8.12.

§ 5.4 Prior to commencement of the Work, each party shall provide certificates of insurance showing their respective coverages.

§ 5.5 Unless specifically precluded by the Owner's property insurance policy, the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, suppliers, agents, and employees, each of the other; and (2) the Architect, Architect's consultants, and any of their agents and employees, for damages caused by fire or other

causes of loss to the extent those losses are covered by property insurance or other insurance applicable to the Project, except such rights as they have to the proceeds of such insurance.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 The Contract

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 The Work

The term "Work" means the construction and services required by the Contract Documents, and includes all other labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the Contractor's obligations.

§ 6.3 Intent

The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

§ 6.4 Ownership and Use of Architect's Drawings, Specifications and Other Documents

Documents prepared by the Architect are instruments service for use solely with respect to this Project. The Architect and Owner shall retain all common law, statutory, and other reserved rights, including the copyright. The Contractor, subcontractors, sub-subcontractors, and suppliers are authorized to use and reproduce the instruments of service solely and exclusively for execution of the Work. The instruments of service may not be used for other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner.

§ 6.5 Electronic Notice

Written notice under this Agreement may be given by one party to the other by email as set forth below.
(Insert requirements for delivering written notice by email such as name, title, and email address of the recipient, and whether and how the system will be required to generate a read receipt for the transmission.)

« »

ARTICLE 7 OWNER

§ 7.1 Information and Services Required of the Owner

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all necessary surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees under Section 8.7.1 that are the responsibility of the Contractor, the Owner shall obtain and pay for other necessary approvals, easements, assessments, and charges.

§ 7.1.3 Prior to commencement of the Work, at the written request of the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence.

§ 7.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work which is not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

§ 7.3 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies. In such case, the Architect may withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the cost of correction, provided the actions of the Owner and amounts charged to the Contractor were approved by the Architect.

§ 7.4 Owner's Right to Perform Construction and to Award Separate Contracts

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

ARTICLE 8 CONTRACTOR

§ 8.1 Review of Contract Documents and Field Conditions by Contractor

§ 8.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the Architect.

§ 8.2 Contractor's Construction Schedule

The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work.

§ 8.3 Supervision and Construction Procedures

§ 8.3.1 The Contractor shall supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner, through the Architect, the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner or Architect have made a timely and reasonable objection.

§ 8.4 Labor and Materials

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

§ 8.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

§ 8.5 Warranty

The Contractor warrants to the Owner and Architect that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Any material or equipment warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 12.5.

§ 8.6 Taxes

The Contractor shall pay sales, consumer, use, and similar taxes that are legally required when the Contract is executed.

§ 8.7 Permits, Fees and Notices

§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work.

§ 8.7.2 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the Architect in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

§ 8.8 Submittals

The Contractor shall promptly review, approve in writing, and submit to the Architect shop drawings, product data, samples, and similar submittals required by the Contract Documents. Shop drawings, product data, samples, and similar submittals are not Contract Documents.

§ 8.9 Use of Site

The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents, and the Owner.

§ 8.10 Cutting and Patching

The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 8.11 Cleaning Up

The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material; and shall properly dispose of waste materials.

§ 8.12 Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them, from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder.

ARTICLE 9 ARCHITECT

§ 9.1 The Architect will provide administration of the Contract as described in the Contract Documents. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The Architect will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor.

§ 9.5 The Architect has authority to reject Work that does not conform to the Contract Documents.

§ 9.6 The Architect will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.9 The Architect's duties, responsibilities, and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The 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, and the Contract Sum and Contract Time shall be adjusted accordingly, in writing. If the Owner and Contractor cannot agree to a change in the Contract Sum, the Owner shall pay the Contractor its actual cost plus reasonable overhead and profit.

§ 10.2 The Architect may authorize or order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. Such authorization or order shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall proceed with such minor changes promptly.

§ 10.3 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to equitable adjustment.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment.

§ 11.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 Contract Sum

The Contract Sum stated in this Agreement, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 12.2 Applications for Payment

§ 12.2.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for Work completed in accordance with the values stated in this Agreement. The Application shall be supported by data substantiating the Contractor's right to payment as the Owner or Architect may reasonably require, such as evidence of payments made to, and waivers of liens from, subcontractors and suppliers. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing.

§ 12.2.2 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or other encumbrances adverse to the Owner's interests.

§ 12.3 Certificates for Payment

The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in part; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole. If certification or notification is not made within such seven day period, the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop

the Work until payment of the amount owing has been received. The Contract Time and the Contract Sum shall be equitably adjusted due to the delay.

§ 12.4 Progress Payments

§ 12.4.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Contract Documents.

§ 12.4.2 The Contractor shall promptly pay each subcontractor and supplier, upon receipt of payment from the Owner, an amount determined in accordance with the terms of the applicable subcontracts and purchase orders.

§ 12.4.3 Neither the Owner nor the Architect shall have responsibility for payments to a subcontractor or supplier.

§ 12.4.4 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the requirements of the Contract Documents.

§ 12.5 Substantial Completion

§ 12.5.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

§ 12.5.2 When the Contractor believes that the Work or designated portion thereof is substantially complete, it will notify the Architect and the Architect will make an inspection to determine whether the Work is substantially complete. When the Architect determines that the Work is substantially complete, the Architect shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, establish the responsibilities of the Owner and Contractor, and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 12.6 Final Completion and Final Payment

§ 12.6.1 Upon receipt of a final Application for Payment, the Architect will inspect the Work. When the Architect finds the Work acceptable and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment.

§ 12.6.2 Final payment shall not become due until the Contractor submits to the Architect releases and waivers of liens, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests, or encumbrances arising out of the Contract.

§ 12.6.3 Acceptance of final payment by the Contractor, a subcontractor or supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 13 PROTECTION OF PERSONS AND PROPERTY

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury, or loss to employees on the Work and other persons who may be affected thereby, the Work and materials and equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, or by anyone for whose acts the Contractor may be liable.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement, and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of one year after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Assignment of Contract

Neither party to the Contract shall assign the Contract as a whole without written consent of the other.

§ 15.2 Tests and Inspections

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the Architect requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections, or approvals that do not become requirements until after the Contract is executed. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 15.3 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 Termination by the Contractor

If the Work is stopped under Section 12.3 for a period of 14 days through no fault of the Contractor, the Contractor may, upon seven additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, and costs incurred by reason of such termination.

§ 16.2 Termination by the Owner for Cause

§ 16.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the subcontractors;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** is otherwise guilty of substantial breach of a provision of the Contract Documents.

§ 16.2.2 When any of the above reasons exist, the Owner, after consultation with the Architect, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may

- **.1** take possession of the site and of all materials thereon owned by the Contractor, and
- **.2** finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

§ 16.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 17 OTHER TERMS AND CONDITIONS
(Insert any other terms or conditions below.)

« §17.1 The Owner, with regard to work performed under the contract, shall not discriminate on the grounds of race, color, sex, or national origin and shall comply with the provisions of Title VI of the Civil Rights Act of 1964 and the regulations promulgated thereunder. »

This Agreement entered into as of the day and year first written above.
(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

« »

OWNER *(Signature)*

« »« »

(Printed name and title)

CONTRACTOR *(Signature)*

« »« »

(Printed name and title)
LICENSE NO.:
JURISDICTION:

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

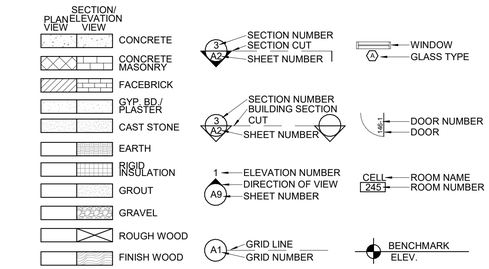
822 Douglas Street
Sioux City, IA 51101

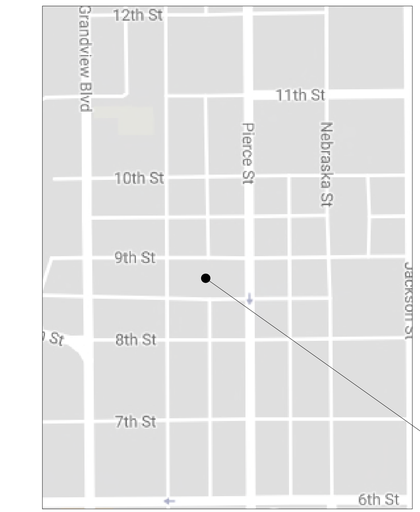
ABBREVIATIONS:

A.C.	AIR CONDITIONER	FIN.FL./F.F.	FINISHED FLOOR	OPP. HD.	OPPOSITE HAND
ACOUST.	ACOUSTICAL	FL.	FLOOR OR FLOW LINE	PL.	PLATE
ADJ.	ADJUSTABLE/ADJACENT	FLR.	FLOOR	PLAS.	PLASTIC
A.F.F.	ABOVE FINISH FLOOR	F.R.	FIRE RATED	PLYW'D	PLYWOOD
ALUM.	ALUMINUM	FT.	FOOT	PREFIN	PREFINISHED
ANC'S	ANCHORS	FTG.	FOOTING	P.S.I.	POUNDS PER SQUARE INCH
ANOD.	ANODIZED	FND.	FOUNDATION	P.S.F.	POUNDS PER SQUARE FOOT
BATT.	BATTEN	GA.	GAUGE	PT.	PAINT
BIT.	BITUMEN	GALV.	GALVANIZED	R.D.	ROOF DRAIN
BLDG.	BUILDING	GCP	GLASS CLAD POLYCARBONATE	REF.	REFRIGERATOR / REFERENCE
BLK.	BLOCK	GRD.	GRADE	REINF.	REINFORCING
BM.	BEAM	GWB	GYPSUM WALL BOARD	RM.	ROOM
BRD.	BOARD	H/C OR H.C.	HANDICAP	R.O.	ROUGH OPENING
BRNG	BEARING	H.M.	HOLLOW METAL	R.T.U.	ROOF TOP UNIT
BTM	BOTTOM	HORZ	HORIZONTAL	SAN. S.	SANITARY SEWER
C.B.	CHALKBOARD	H.R.	HANDRAIL	SCHED.	SCHEDULE
C.C.	CENTER TO CENTER	H.W.	HOT WATER	S.D.	STORM DRAIN
C.I.	CAST IRON	I.G.	INLET GRATE	S.L.	STEEL LINTEL
C.I.P.	CAST IN PLACE	IN.	INCH	SP.	SPACES
C.J.	CONTROL JOINT	INSL.	INSULATED	SQ.	SQUARE
C.L.	CENTER LINE	INSUL.	INSULATION	S.S.	STAINLESS STEEL
CLG	CEILING	INT.	INTERIOR	S.S.	STORM SEWER
CLR.	CLEAR	J.B.	JOIST BEARING	SPECS.	SPECIFICATIONS
CMU	CONCRETE MASONARY UNIT	JT.	JOINT	S.STL.	STAINLESS STEEL
COL	COLUMN	LAM.	LAMINATE	STD.	STANDARD
CONC	CONCRETE	LBS.	POUNDS	STL.	STEEL
CONNEX.	CONNECTION	L.L.H.	LONG LEG HORIZONTAL	STOR.	STORAGE
CONT	CONTINUOUS	L.L.V..	LONG LEG VERTICAL	STRUCT.	STRUCTURE
C.W.	COLD WATER	LT.WT.	LIGHT WEIGHT	SUSP.	SUSPENDED
DIA	DIAMETER	M.O.	MASONRY OPENING	S.V.	SEALED & VARNISHED
D.S.	DOWN SPOUT	MAS.	MASONRY	T.B.	TACKBOARD
DWL.	DOWEL	MAX.	MAXIMUM	TEL.	TELEPHONE
EA.	EACH	MET.	METAL	THK.	THICK
E.F.	EXHAUST FAN	MECH.	MECHANICAL	TLT.	TOILET
EL/ELEV.	ELEVATION	MFG.	MANUFACTURING	T.O.C.	TOP OF CONCRETE
ELEC.	ELECTRIC	MIN.	MINIMUM	T.O.F.	TOP OF FOOTING
E.W.C.	ELECTRIC WATER COOLER	M.L.	MASONRY LINTEL	T.O.M.	TOP OF MASONRY
E.J.	EXPANSION JOINT	MLDG.	MOULDING	T.O.S.	TOP OF STEEL
EQ.	EQUAL	MOD.	MODIFIED	TYP.	TYPICAL
E.W.	EACH WAY	MTG.	MOUNTING	U.N.O.	UNLESS NOTED OTHERWISE
EXIST.	EXISTING	MTL.	METAL	VERT.	VERTICAL
EXP.	EXPANSION	MTR.	MOTOR	V.C.T.	VINYL COMPOSITION TILE
EXT.	EXTERIOR	N.I.C.	NOT IN CONTRACT	V.T.R.	VENT THRU ROOF
F.B.	FLAT BAR	NOM.	NOMINAL	W.C.	WATER CLOSET
F.D.	FLOOR DRAIN OR FIRE DEPARTMENT	N.T.S.	NOT TO SCALE	W.G.	WIRE GLASS
		O.C.	ON CENTER	W/	WITH
FIN.	FINISHED	O.D.	OUTSIDE DIAMETER	W/O	WITHOUT
		OPN'G	OPENING	W.W.F.	WELDED WIRE FABRIC

SHEET INDEX:

SYMBOLS:





VICINITY MAP
N.T.S.

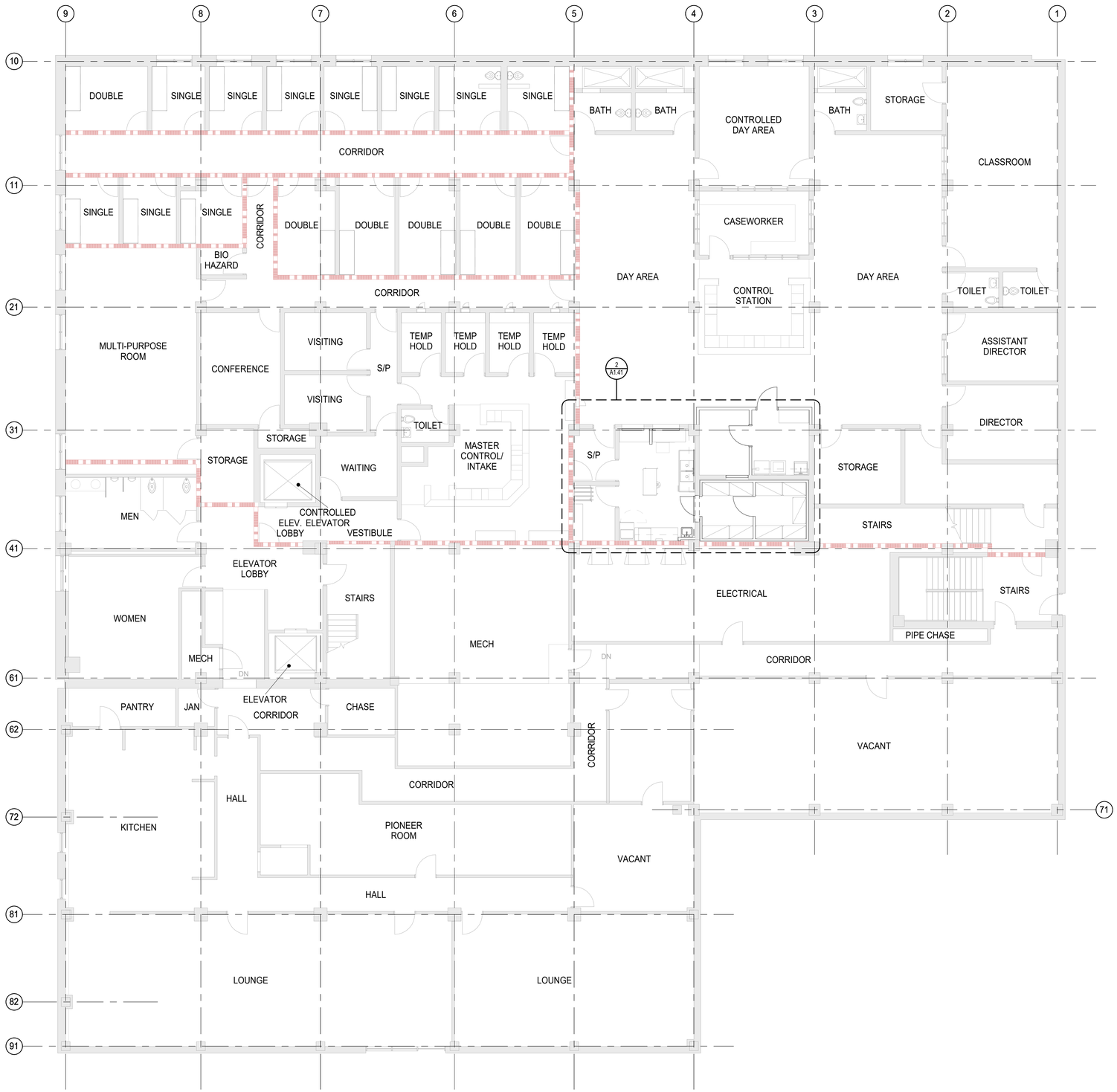
MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC
3116 South Duff Avenue, Suite 201
Ames, Iowa 50010
P: (515) 509-8905

PROJECT NO: 16007-01

DATE: 02.01.2019

ISSUED FOR: BID

GOLDBERG GROUP ARCHITECTS, PC
gga
Architecture • Feasibility Studies • Criminal Justice Planning • Interiors
805 N. 36th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399



FOURTH FLOOR CODE ANALYSIS PLAN

1/8" = 1'-0"

CODE ANALYSIS

PROJECT — WOODBURY COUNTY JDC KITCHEN & LAUNDRY RENOVATIONS
822 DOUGLAS STREET, #401
SIOUX CITY, IA 51101

OWNER — WOODBURY COUNTY BOARD OF SUPERVISORS
620 DOUGLAS STREET
SIOUX CITY, IA 51101
(712) 279-6525

BUILDING DEPARTMENT — 405 6TH STREET
SIOUX CITY, IA 51102
(712) 224-5216

FIRE DEPARTMENT — 601 DOUGLAS STREET
SIOUX CITY, IA 51101
(712) 279-6314

GAS SERVICE — MID-AMERICAN ENERGY COMPANY
401 DOUGLAS STREET
SIOUX CITY, IA 51101
(888) 427-5632

ELECTRIC SERVICE — MID-AMERICAN ENERGY COMPANY
401 DOUGLAS STREET
SIOUX CITY, IA 51101
(888) 427-5632

WATER SERVICE — CITY OF SIOUX CITY
1921 18TH STREET
SIOUX CITY, IA 51105
(712) 279-6164

NEW CONSTRUCTION

- 2015 INTERNATIONAL BUILDING CODE
- 2012 UNIFORM PLUMBING CODE
- 2012 INTERNATIONAL MECHANICAL CODE
- 2014 NATIONAL ELECTRICAL CODE
- 2012 INTERNATIONAL FIRE CODE
- 2012 INTERNATIONAL ENGERGY CONSERVATION CODE
- 2010 ADA STANDARDS FOR ACCESSIBILE DESIGN
- AMERICAN CORRECTIONAL ASSOCIATION STANDARDS FOR ADULT LOCAL DETENTION FACILITIES 4th EDITION & SUPPLEMENTS

LEGEND

	SMOKE PARTITION W/ SEALED PENETRATIONS & SWING DOORS	2	PRIMARY EGRESS ROUTE & EGRESS LOAD (STAFF SUPERVISED)
	60 MIN. FIRE RATE SMOKE BARRIER W/ SEALED PENETRATIONS & SWING DOORS	2	PRIMARY EGRESS ROUTE & EGRESS LOAD (SELF DIRECTED)
	60 MIN. FIRE RATED OCCUPANCY SEPARATION / FIRE BARRIER	FE	FIRE EXTINGUISHER LOCATION, RE: A4 SHEETS
	120 MIN. FIRE BARRIER	(2)	ROOM OCCUPANT LOAD

GOLDBERG GROUP ARCHITECTS, PC
gga
Architecture • Feasibility Studies • Criminal Justice Planning • Interiors
805 N. 38th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399

CONSULTANTS:
MEP: RESOURCE CONSULTING ENGINEERS, LLC
316 South Duff Avenue, Suite 201
Ames, Iowa 50010
P: (515) 509-9905

PROJECT:
WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS
822 Douglas Street
Sioux City, IA 51101

#	Description	Date

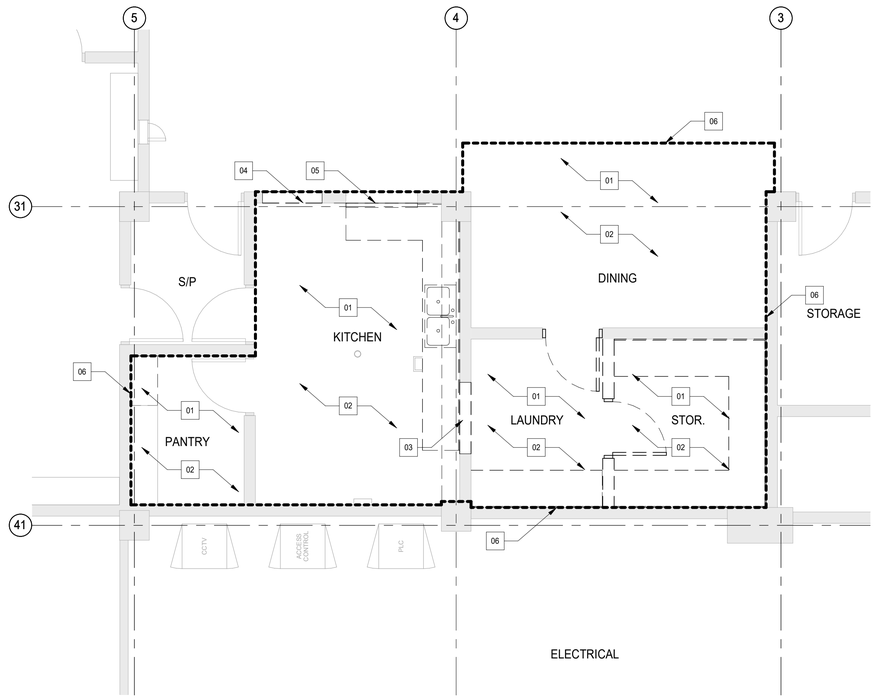
IF YOU ARE LOOKING AT AN INCOMPLETE SET OF CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATIONS), YOU MAY BE MISSING PORTIONS OF THE WORK FOR WHICH YOU WILL BE RESPONSIBLE.

PROGRESS DRAWINGS: NOT FOR CONSTRUCTION

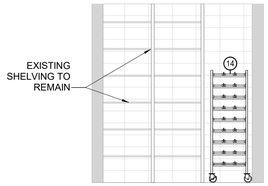
PROJECT NO: 16007-01
DATE: 02.01.2019
ISSUED FOR: BID

SHEET NAME:
FOURTH FLOOR CODE ANALYSIS PLAN

SHEET NUMBER:
G1.41

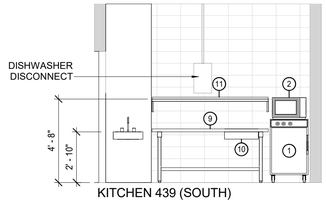


1 FOURTH FLOOR DEMOLITION PLAN
1/4" = 1'-0"



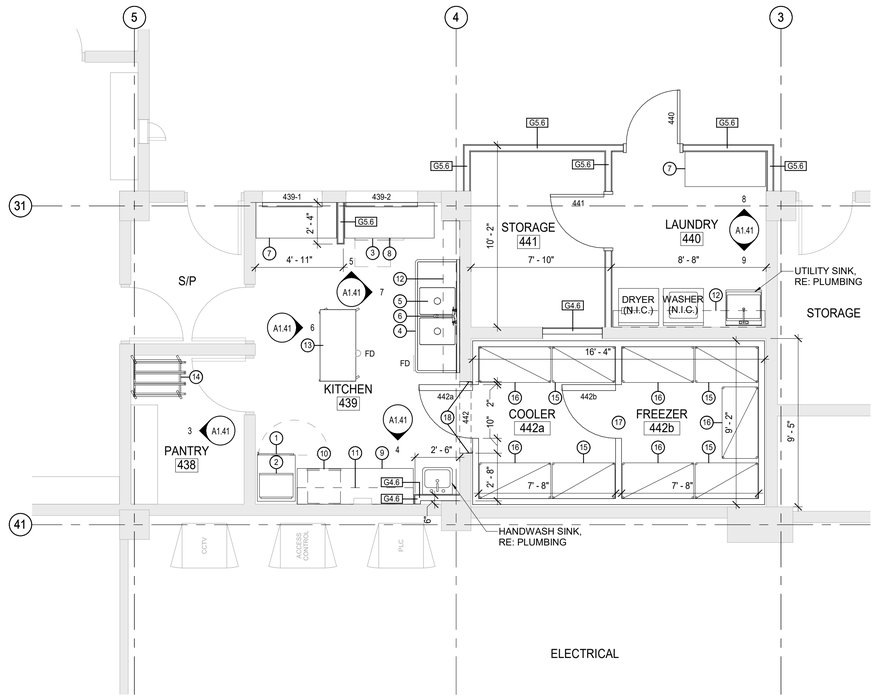
PANTRY 438 (WEST)

3 INTERIOR ELEVATION
1/4" = 1'-0"



KITCHEN 439 (SOUTH)

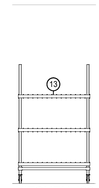
4 INTERIOR ELEVATION
1/4" = 1'-0"



2 FOURTH FLOOR PLAN
1/4" = 1'-0"

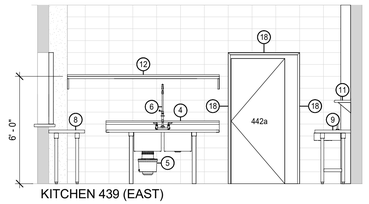
KITCHEN 439 (NORTH)

5 INTERIOR ELEVATION
1/4" = 1'-0"



KITCHEN 439 (EAST)

6 INTERIOR ELEVATION
1/4" = 1'-0"

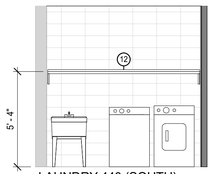


KITCHEN 439 (EAST)

7 INTERIOR ELEVATION
1/4" = 1'-0"

LAUNDRY 440 (NORTH)

8 INTERIOR ELEVATION
1/4" = 1'-0"



LAUNDRY 440 (SOUTH)

9 INTERIOR ELEVATION
1/4" = 1'-0"

GENERAL DEMOLITION NOTES

1. DOCUMENTS WERE PREPARED BASE ON EXISTING DRAWINGS AND GENERAL FIELD OBSERVATIONS AND MEASUREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL INFORMATION, MEASUREMENTS AND CONDITIONS PRIOR TO START OF WORK.
2. DRAWINGS INDICATE THE GENERAL INTENT OF SCOPE OF WORK. ANY AND ALL HIDDEN CONDITIONS, DISCREPANCIES, ETC.. SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND OWNER AS SOON AS POSSIBLE.
3. ALL FLOORS OF THE BUILDING WILL BE OCCUPIED DURING CONSTRUCTION. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THE SAFETY OF THE OCCUPANTS.
4. CONTRACTOR SHALL COORDINATE ALL WORK SCHEDULES WITH THE OWNER PRIOR TO COMMENCEMENT OF ANY WORK.
5. REFER TO MECHANICAL AND ELECTRICAL PLANS FOR EXTEND OF HVAC, PLUMBING AND ELECTRICAL DEMOLITION WORK.

DEMOLITION KEYED NOTES

01 REMOVE ALL EXISTING WALLS, DOORS, WINDOW, CASEWORK, PLUMBING FIXTURES, ETC... INDICATED WITH DASHED LINES, INCLUDING ALL EXISTING ELECTRICAL DEVICES, PLUMBING PIPING, DATA AND TELEPHONE OUTLETS. TERMINATE ELECTRICAL DEVICES BACK TO POINT OF ORIGIN, CAP OR PLUG ALL PLUMBING PIPING ABOVE CEILING OR BELOW SLAB AS REQUIRED.

02 REMOVE ALL EXISTING FLOORING. PATCH AND REPAIR SURFACES AS REQUIRED FOR NEW INSTALLATION.

03 REMOVE PORTION OF EXISITNG WALL FROM JOINT TO JOINT FOR NEW OPENING. PATCH AND REPAIR EXISTING WALL AS REQUIRED. INSTALL NEW LINTEL PRIOR TO REMOVAL OF EXISTING MASONRY, RE: 6/A6.01.

04 REMOVE PORTION OF EXISITNG WALL FOR NEW DOOR INSTALLATION. PATCH AND REPAIR EXISTING WALL AS REQUIRED. INSTALL NEW LINTEL PRIOR TO REMOVAL OF EXISTING MASONRY, RE: 6/A6.01.

05 REMOVE EXISITNG DOOR AND PORTION OF EXISTING WALL FOR NEW DOOR INSTALLATION. PATCH AND REPAIR EXISTING WALL AS REQUIRED.

06 EXTENT OF DEMOLITION AND NEW CONSTRUCTION. PATCH AND REPAIR EXISTING FINISHES, FRAMING, ETC... TO MATCH EXISTING ADJACENT FINISHES TO REMAIN.

WALL TYPES LEGEND

G4.6 3 5/8" METAL STUDS @ 16" O.C. UP TO BOTTOM OF CEILING ABOVE W/ EXPANDED METAL SECURITY MESH & 5/8" IMPACT RESISTANT GYP. BD. ON ONE SIDE. EXTEND EXPANDED METAL SECURITY MESH & GYP. BOARD TO BOTTOM OF CEILING ABOVE.

G5.6 3 5/8" METAL STUDS @ 16" O.C. UP TO BOTTOM OF CEILING ABOVE W/ EXPANDED METAL SECURITY MESH & 5/8" IMPACT RESISTANT GYP. BD. ON EACH SIDE. EXTEND EXPANDED METAL SECURITY MESH & GYP. BD. TO BOTTOM OF CEILING ABOVE.

GENERAL NOTES

1. BRACE ALL WALLS AS REQUIRED.
2. MATCH ADJACENT WALL FINISH WHERE NEW CONSTRUCTION ADJOINS EXISTING.

KITCHEN & LAUNDRY ACCESSORIES

1 OVEN
VULCAN # VRH8
208V/1PH

2 MICROWAVE
SOLWAVE # 180MW2100T

3 UNDERCOUNTER DISHWASHER
HOBART # LXEC
120V/60/1PH
POWER CORD KIT

4 TWO-COMPARTMENT SINK
EAGLE GROUP # FN2036-2-18-14/3
T&S # B-3972-01 LEVER WASTE VALVE
T&S # B-0231-CC SINK MIXING FAUCET
T&S # B-0133-B EASYINSTALL PRE-RINSE UNIT
T&S # B-0230-K INSTALLATION KIT
E41 DISPOSAL PROVISION PACKAGE
3/4" CW, 3/4" HW, (2) 2" ID, 2" W

5 FOOD DISPOSER
HOBART # FD4/200
208-240V/60/3PH, 6.0A
1/2" CW, 2" W

6 PRE-RINSE OVERHEAD SWIVEL SPRAYER
T&S # B-0131-C LOW-FLOW SPRAY VALVE
T&S # B-0109-01 WALL BRACKET
3/4" CW, 3/4" HW, 2" ID

7 WORK TABLE
EAGLE GROUP # T2454SB
1 5/8" STAINLESS STEEL LEGS W/
STAINLESS STEEL ADJUSTABLE FEET

8 WORK TABLE
EAGLE GROUP # T2460STB
1 5/8" STAINLESS STEEL LEGS W/
STAINLESS STEEL ADJUSTABLE FEET

9 WORK TABLE
EAGLE GROUP # T2478SB-BS
1 5/8" STAINLESS STEEL LEGS W/
STAINLESS STEEL ADJUSTABLE FEET

10 KNIFE DRAWER
EAGLE GROUP # 502946-X
20" x 20"
430 TYPE STAINLESS STEEL DRAWER ASSEMBLY W/
LOCK

11 WALL SHELF
ADVANCE TABCO # WS-12-60
6'-6" W x 12" D

12 WALL SHELF
ADVANCE TABCO # WS-12-60
8'-6" W x 12" D

13 MOBILE TRAY DRYING/STORAGE RACK
LAKESIDE # PBTDR42

14 MOBILE CAN RACK
ADVANCE TABCO # CR10-162M
243/4" L x 351/8" W x 71" H

15 WALK-IN COOLER/FREEZER SHELVING
NEW AGE INDUSTRIAL # 2442SB
24"D x 42"L x 68"H W/ 4 SHELVES
(BY KITCHEN EQUIPMENT CONTRACTOR)

16 WALK-IN COOLER/FREEZER SHELVING
NEW AGE INDUSTRIAL # 2448SB
24"D x 48"L x 68"H W/ 4 SHELVES
(BY KITCHEN EQUIPMENT CONTRACTOR)

17 WALK-IN COOLER/FREEZER
150 S.F. +/- (NET)
WITH (2) 1' x 4' LIGHT FIXTURES

18 STAINLESS STEEL CLOSURE PLATE
BY COOLER MFR.
AROUND WALL OPENING

GOLDBERG GROUP ARCHITECTS, PC
gga
Architecture • Feasibility Studies • Criminal Justice Planning • Interiors
805 N. 38th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399

CONSULTANTS:
MEP: RESOURCE CONSULTING ENGINEERS, LLC
316 South Duff Avenue, Suite 201
Ames, Iowa 50010
P: (515) 509-9905

PROJECT:
WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS
822 Douglas Street
Sioux City, IA 51101

#	Description	Date

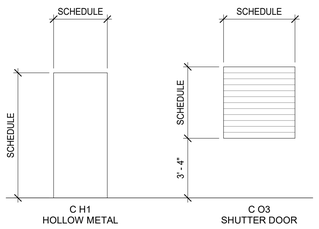
IF YOU ARE LOOKING AT AN INCOMPLETE SET OF CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATIONS), YOU MAY BE MISSING PORTIONS OF THE WORK FOR WHICH YOU WILL BE RESPONSIBLE.

PROGRESS DRAWINGS: NOT FOR CONSTRUCTION

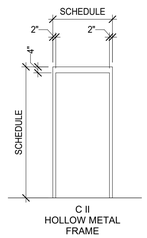
PROJECT NO: 16007-01
DATE: 02.01.2019
ISSUED FOR: BID

SHEET NAME: FOURTH FLOOR DEMOLITION PLAN & FLOOR PLAN

SHEET NUMBER: A1.41



DOOR TYPES SCALE: 1/4" = 1'-0"



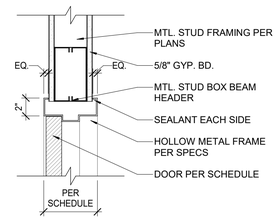
FRAME TYPES SCALE: 1/4" = 1'-0"

DOOR SCHEDULE

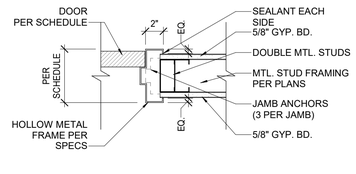
Mark	Room Name	Door Nom.Size			Secure Opening	Door			Frame			Frame Details			Fire Rating	Hardware Set	Remarks
		W	H	T		Type	Material	Glazing	Type	Material	Glazing	Head	Jamb/H	Jamb/S			
439-1	KITCHEN	3' - 4"	4' - 0"	0' - 3"		C O3	STL	-	-	-	-	3/A6.01	4/A6.01	4/A6.01		-	
439-2	KITCHEN	4' - 0"	4' - 0"	0' - 3"		C O3	STL	-	-	-	-	3/A6.01	4/A6.01	4/A6.01		-	
440	LAUNDRY	3' - 0"	7' - 0"	0' - 1 3/4"		C H1	HM	-	C I	HM	-	1/A6.01	2/A6.01	2/A6.01		B03	
441	STORAGE	3' - 0"	7' - 0"	0' - 1 3/4"		C H1	HM	-	C I	HM	-	1/A6.01	2/A6.01	2/A6.01		B03	
442	COOLER	4' - 0"	7' - 4"			-	-	-	-	-	-	6/A6.01	-	-		-	
442a	COOLER	3' - 0"	7' - 0"	0' - 4"		-	-	-	-	-	-	-	-	-		-	NOTE 1
442b	FREEZER	3' - 0"	7' - 0"	0' - 4"		-	-	-	-	-	-	-	-	-		-	NOTE 1

NOTES

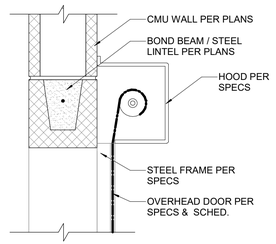
1. DOOR BY WALK-IN COOLER / FREEZER MANUFACTURER



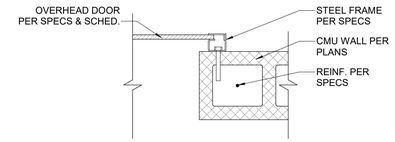
1 DOOR HEAD
1 1/2" = 1'-0"



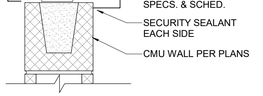
2 DOOR JAMB
1 1/2" = 1'-0"



3 DOOR HEAD
1 1/2" = 1'-0"



4 DOOR JAMB
1 1/2" = 1'-0"



5 DOOR SILL
1 1/2" = 1'-0"

NOTE: CMU BOND BEAM MAY BE USED IN PLACE OF STEEL ANGLE LINTEL AT CONTRACTOR'S OPTION

6 LINTEL DETAIL
1 1/2" = 1'-0"

GOLDBERG GROUP ARCHITECTS, PC
gga
Architecture • Feasibility Studies • Criminal Justice Planning • Interiors
805 N. 36th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399

CONSULTANTS:
MEP: RESOURCE CONSULTING ENGINEERS, LLC
3116 South Duff Avenue, Suite 201
Ames, Iowa 50010
P: (515) 509-9905

PROJECT:
WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS
822 Douglas Street
Sioux City, IA 51101

#	Description	Date

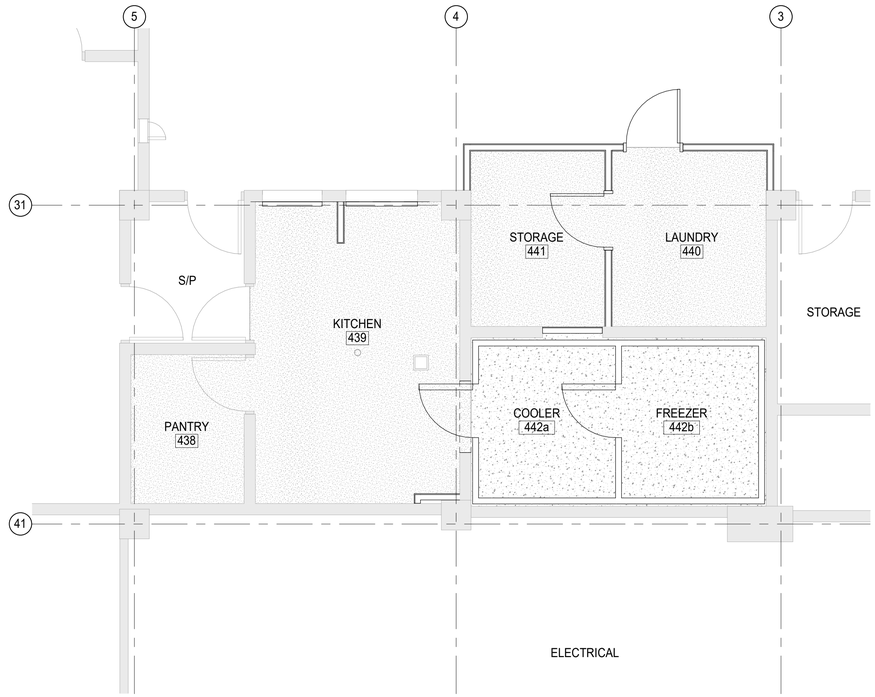
IF YOU ARE LOOKING AT AN INCOMPLETE SET OF CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATIONS), YOU MAY BE MISSING PORTIONS OF THE WORK FOR WHICH YOU WILL BE RESPONSIBLE.

PROGRESS DRAWINGS: NOT FOR CONSTRUCTION

PROJECT NO:
16007-01
DATE:
02.01.2019
ISSUED FOR:
BID

SHEET NAME:
DOOR SCHEDULE & COMMERCIAL DOOR / FRAME TYPES & DETAILS

SHEET NUMBER:
A6.01



1 FOURTH FLOOR FINISH PLAN
1/4" = 1'-0"

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS				CEILING FINISH	CAULK	REMARKS / NOTES
				N	S	E	W			
438	PANTRY	FAF-1	FAB-1	PT-1	PT-1	PT-1	PT-1	PT-3	NS	1
439	KITCHEN	FAF-1	FAB-1	PT-1	PT-1	PT-1	PT-1	PT-3	NS	1
440	LAUNDRY	FAF-1	FAB-1	PT-1	PT-1	PT-1	PT-1	-	NS	1
441	STORAGE	FAF-1	FAB-1	PT-1	PT-1	PT-1	PT-1	-	NS	1
442a	COOLER	CON-1	-	-	-	-	-	-	NS	(none)
442b	FREEZER	CON-1	-	-	-	-	-	-	NS	(none)

FLOOR FINISH LEGEND

CON-1

EX-1

FAF-1

ROOM FINISH KEY

FLOOR FINISHES

CON-1 SEALED CONCRETE (PIGMENTED SEALER PER SPEC; COLOR T.B.D.)
EX-1 EXISTING FLOORING TO REMAIN
FAF-1 EPOXY FLOORING WITH QUARTZ AGGREGATE (COLOR TO BE SELECTED BY ARCHITECT)

BASE MOLD

FAB-1 EPOXY FLOORING WITH QUARTZ AGGREGATEBASE W/ COVE CAP (TO COORDINATE W/ FAF-1)
SB-1 SECURITY CAULK AT FLOOR / WALL INTERSECT

PAINT

PT-1 WALLS (MATCH EXISTING)
PT-2 NON-WOOD DOORS & FRAMES (MATCH EXISTING)
PT-3 CEILING PAINT (MATCH EXISTING)

CAULK

NS NON-SECURITY CAULK
SEC SECURITY CAULKING (PER SPECIFICATIONS)

ACCESSORIES

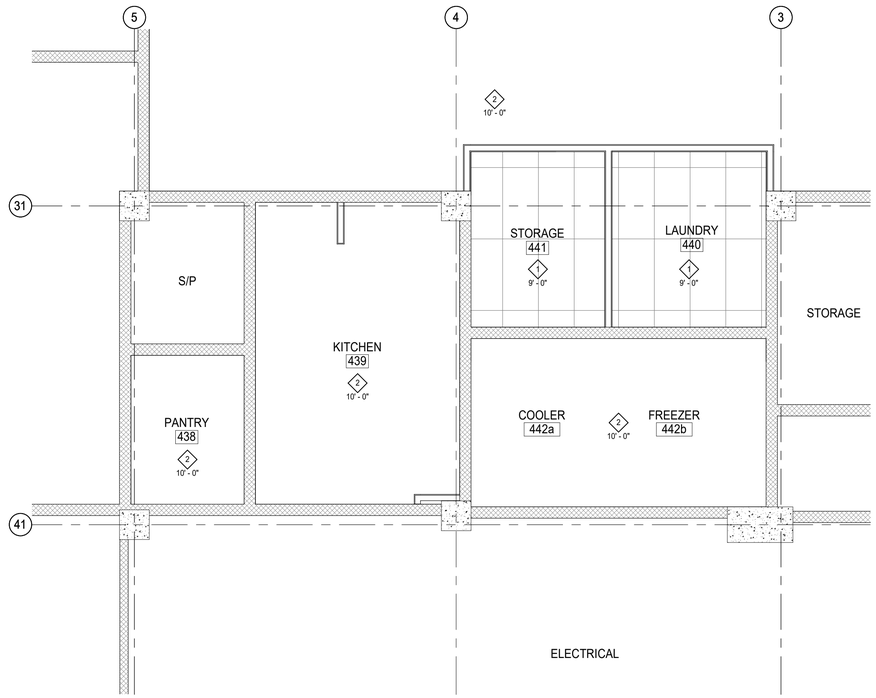
TR-01 TRANSITION FROM FLOORING FAF-1 TO CON-1 (AT OPENING #442 ONLY)
TR-02 TRANSITION FROM FLOORING FAF-1 TO EX-1

GENERAL FINISH NOTES

1. TRANSITIONS TO BE USED AT ALL LOCATIONS WHERE FLOORING MATERIALS CHANGE FROM ONE TO ANOTHER.
2. ALL NON-WOOD DOORS AND FRAMES AND WINDOW FRAMES ARE TO BE PAINTED PT-2 UNLESS OTHERWISE NOTED.

CEILING MATERIAL SCHEDULE

1 SUSPENDED ACOUSTICAL TILE CEILING, 24" x 48"
2 EXISTING CEILING TO REMAIN



3 FOURTH FLOOR REFLECTED CEILING PLAN
1/4" = 1'-0"

GOLDBERG GROUP ARCHITECTS, PC
gga
Architecture • Feasibility Studies • Criminal Justice Planning • Interiors
805 N. 36th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399

CONSULTANTS:
MEP: RESOURCE CONSULTING ENGINEERS, LLC
3116 South Duff Avenue, Suite 201
Ames, Iowa 50010
P: (515) 509-9905

PROJECT:
WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS
822 Douglas Street
Sioux City, IA 51101

#	Description	Date

IF YOU ARE LOOKING AT AN INCOMPLETE SET OF CONTRACT DOCUMENTS (DRAWINGS & SPECIFICATIONS), YOU MAY BE MISSING PORTIONS OF THE WORK FOR WHICH YOU WILL BE RESPONSIBLE.

PROGRESS DRAWINGS: NOT FOR CONSTRUCTION

PROJECT NO: 16007-01
DATE: 02.01.2019
ISSUED FOR: BID

SHEET NAME:
FOURTH FLOOR FINISH PLAN & REFLECTED CEILING PLAN

SHEET NUMBER:
A9.41

GENERAL ABBREVIATIONS

A	- AMPS
AAV	- AUTOMATIC AIR VENT
ADJ	- ADJUSTABLE
AFF	- ABOVE FINISHED FLOOR
AL	- ALUMINUM
ALT	- ALTERNATE
AP	- ACCESS PANEL
BAS	- BUILDING AUTOMATION SYSTEM
BOD	- BOTTOM OF DUCT
BOP	- BOTTOM OF PIPE
BTU	- BRITISH THERMAL UNIT
BTUH	- BRITISH THERMAL UNIT PER HOUR
CC	- COOLING COIL
CEA	- COMBINED EXHAUST AIR (LAB/GENERAL)
CFCI	- CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CFH	- CUBIC FEET PER HOUR
CFM	- CUBIC FEET PER MINUTE
CL	- CENTERLINE
COD	- CENTER OF DUCT
COND	- CONDENSATE/CONDENSER
COP	- CENTER OF PIPE
CS	- CARBON STEEL
CU	- COPPER
CV	- CONSTANT VOLUME
DB	- DRY BULB
DDC	- DIRECT DIGITAL CONTROL
DP	- DIFFERENTIAL PRESSURE
DT	- DIFFERENTIAL TEMPERATURE
EA	- EXHAUST AIR
EAT	- ENTERING AIR TEMPERATURE
EC	- ELECTRICAL CONTRACTOR
EDB	- ENTERING DRY BULB TEMPERATURE
EFT	- ENTERING FLUID TEMPERATURE
EG	- ETHYLENE GLYCOL
EL	- ELEVATION
ESP	- EXTERNAL STATIC PRESSURE
ETR	- EXISTING TO REMAIN
EWB	- ENTERING WET BULB TEMPERATURE
EXH	- EXHAUST
EXST	- EXISTING
°F	- DEGREES FAHRENHEIT
FC	- FAIL CLOSED
FD	- FLOOR DRAIN
FH	- FUME HOOD
FL	- FAIL LAST POSITION
FLA	- FULL LOAD AMPS
FLR	- FLOOR
FO	- FAIL OPEN
FPI	- FINS PER INCH
FPM	- FEET PER MINUTE
FPS	- FEET PER SECOND
FS	- FLOOR SINK
FT	- FOOT OR FEET
FTG	- FOOTING
GA	- GAUGE
GAL	- GALLONS
GS	- GENERAL CONTRACTOR
GPH	- GALLONS PER HOUR
GPM	- GALLONS PER MINUTE
GS	- GALVANIZED STEEL
H	- ENTHALPY
HD	- HUB DRAIN
HP	- HORSEPOWER
HZ	- HERTZ
IN	- INCH OR INCHES
KWH	- KILOWATT-HOURS
LAT	- LEAVING AIR TEMPERATURE
LB	- POUND OR POUNDS
LBS	- POUNDS
LDB	- LEAVING DRY BULB TEMPERATURE
LF	- LINEAL FOOT/LINEAL FEET
LRA	- LOCKED ROTOR AMPS
LWB	- LEAVING WET BULB TEMPERATURE
LWT	- LEAVING WATER TEMPERATURE
MBH	- THOUSANDS OF BTU PER HOUR
MC	- MECHANICAL CONTRACTOR
MCA	- MINIMUM CIRCUIT AMPACITY
MCP	- MAXIMUM OVERCURRENT PROTECTION (ALSO MOCP)
MEP	- MECHANICAL, ELECTRICAL AND PLUMBING
NA	- NOT APPLICABLE (ALSO N/A)
NC	- NORMALLY CLOSED
NO	- NORMALLY OPEN
NIC	- NOT IN CONTRACT
NO	- NORMALLY OPEN
NPS	- NOMINAL PIPE SIZE
NPT	- NATIONAL PIPE THREAD
NTS	- NOT TO SCALE
OA	- OUTSIDE AIR/OUTDOOR AIR
OC	- ON CENTER
OED	- OPEN ENDED DUCT
OFCI	- OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	- OWNER FURNISHED, OWNER INSTALLED
OV	- OUTLET VELOCITY
PC	- PLUMBING CONTRACTOR
PCF	- POUNDS PER CUBIC FOOT
PD	- PRESSURE DROP
PG	- PROPYLENE GLYCOL
PH	- PHASE
PSF	- POUNDS PER SQUARE FOOT
PSI	- PONDS PER SQUARE INCH
PSIA	- POUNDS PER SQUARE INCH ABSOLUTE
PSIG	- POUNDS PER SQUARE INCH GAUGE
RA	- RETURN AIR
RPM	- REVOLUTIONS PER MINUTE
SA	- SUPPLY AIR
SCH	- SCHEDULE
SP	- STATIC PRESSURE
SF	- SQUARE FEET
SS	- STAINLESS STEEL
TA	- TRANSFER AIR
TC	- TEMPERATURE CONTROL
TOD	- TOP OF DUCT
TOP	- TOP OF PIPE
TP	- TRAP PRIMER
TSP	- TOTAL STATIC PRESSURE
TYP	- TYPICAL
V	- VOLTS
VAV	- VARIABLE AIR VOLUME
VFD	- VARIABLE FREQUENCY DRIVE
VP	- VELOCITY PRESSURE
VTR	- VENT THROUGH ROOF
WB	- WET BULB
WC	- WATER COLUMN
WG	- WATER GAUGE
W/	- WITH
WMS	- WIRE MESH SCREEN
X	- EXISTING

PIPING SYMBOLS/ABBREVIATIONS

CD	- CONDENSATE DRAIN
DCW	- DOMESTIC COLD WATER
DCW-D	- DOMESTIC COLD WATER - DEMO
DCW-E	- DOMESTIC COLD WATER - EXISTING
DHW	- DOMESTIC HOT WATER
DHW-D	- DOMESTIC HOT WATER - DEMO
DHW-E	- DOMESTIC HOT WATER - EXISTING
DHWR	- DOMESTIC HOT WATER RECIRCULATION
DHWR-D	- DOMESTIC HOT WATER RECIRCULATION - DEMO
DHWR-E	- DOMESTIC HOT WATER RECIRCULATION - EXISTING
RL	- REFRIGERANT LIQUID
RS	- REFRIGERANT SUCTION
SAN	- SANITARY
SAN-D	- SANITARY - DEMO
SAN-E	- SANITARY - EXISTING
V	- VENT
V-D	- VENT - DEMO
V-E	- VENT - EXISTING

- NEW PIPING - REFER TO SYSTEM LABEL FOR TYPE
- EXISTING PIPING TO BE REMOVED
- EXISTING PIPING TO REMAIN
- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- DOMESTIC HOT WATER RECIRCULATIONG PIPING
- PIPE ELBOW DOWN
- PIPE ELBOW UP
- PIPE ELBOW
- PIPE BOTTOM TAKE OFF
- PIPE TOP TAKE OFF
- PIPING DIRECTIONAL FLOW ARROW
- PIPING CONTINUATION MARK

MECHANICAL SYMBOLS

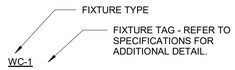
- EQUIPMENT TO BE REMOVED
- CONNECTION TO EXISTING

EQUIPMENT ABBREVIATIONS

CU	- CONDENSING UNIT
DWH	- DOMESTIC HOT WATER HEATER

PLUMBING FIXTURE ABBREVIATIONS

CO - CLEANOUT	GD - GARBAGE DISPOSAL
DW - DISHWASHER	S - SINK
F - FAUCET	TMV - THERMOSTATIC MIXING VALVE
FD - FLOOR DRAIN	WMB- WASHING MACHINE BOX
FS - FLOOR SINK	



PLUMBING SYMBOLS

- CLEAN OUT
- DOUBLE-BOWL KITCHEN SINK
- DISHWASHER
- FLOOR DRAIN/FLOOR SINK
- SINGLE BOWL SINK
- UTILITY SINK
- WASHING MACHINE BOX

MECHANICAL PIPING SYMBOLS

- BALL VALVE
- BUTTERFLY VALVE
- PRESSURE REDUCING VALVE
- CHECK VALVE
- CONTROL VALVE
- STRAINER
- FLOW ARROW
- UNION
- FLEXIBLE CONNECTION
- PUMP
- PRESSURE RELIEF VALVE
- SENSOR
- PRESSURE SENSOR
- CO2 SENSOR

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

ARCHITECT:
INVISION

303 WATSON POWELL JR.
SUITE
DES MOINES, IA
515-663-294
www.invisionarch.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTION

ISSUED: 01/10/2018

PROJECT 2018.033.00

MECHANICAL SYMBOLS AND ABBREVIATIONS

MP0

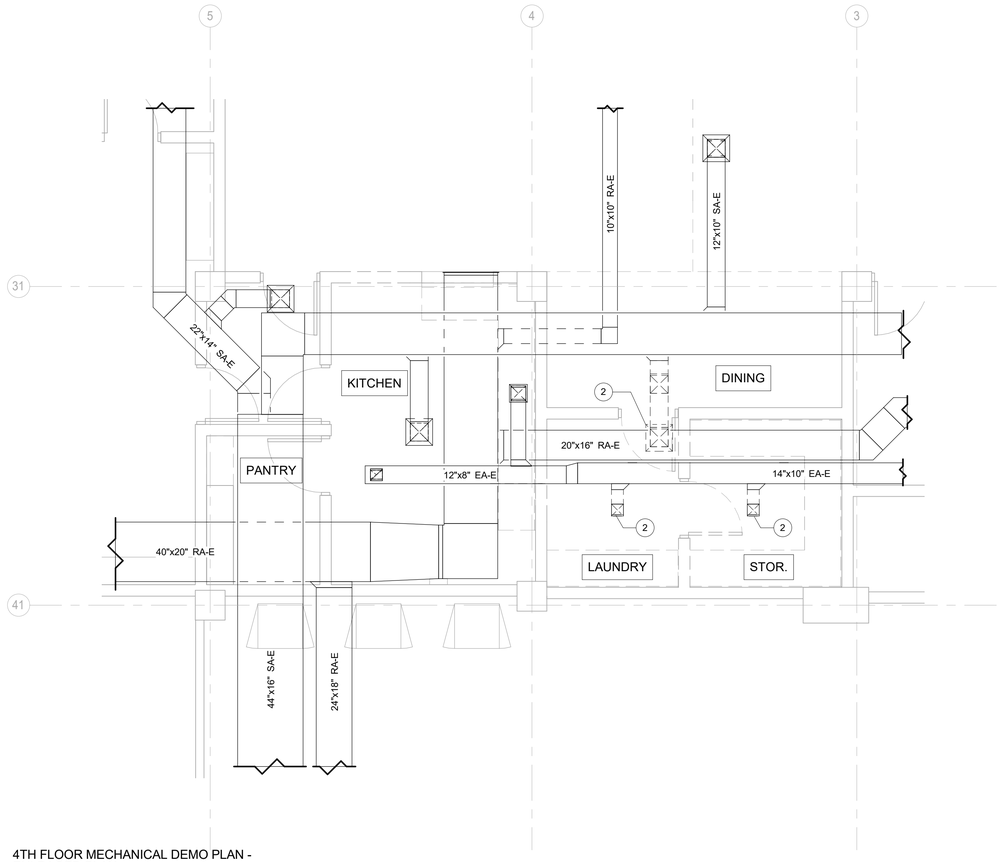
MECHANICAL DEMOLITION NOTES:

A. IF SUSPICIOUS MATERIALS ARE ENCOUNTERED DURING COURSE OF PROJECT WORK, CONTRACTOR SHALL STOP WORK IMMEDIATLEY AND NOTIFY ARCHITECT, ENGINEER, AND OWNER.
B. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
C. ALL WORK SHALL BE SCHEDULED WITH OWNER, WITH MINIMUM OF TWO WEEK NOTICE PRIOR TO SYSTEM SHUT DOWNS.
D. REMOVE INDICATED SECTIONS OF PIPING, ALONG WITH ASSOCIATED INSULATION, SUPPORTS, ETC. IF RE-CONNECTION IS INDICATED, PREPARE REMAINING PIPING FOR CONNECTION TO NEW PIPING OR EQUIPMENT.
E. REMOVE INDICATED SECTIONS OF DUCTWORK, ALONG WITH ASSOCIATED REGISTERS, GRILLES, DIFFUSERS, INSULATION, SUPPORTS, ETC. IF RE-CONNECTION IS INDICATED, PREPARE REMAINING DUCT FOR CONNECTION TO NEW DUCT OR EQUIPMENT.
F. PATCH HOLES TO MATCH EXISTING WHERE PIPES AND DUCTS HAVE BEEN REMOVED.
G. EXISTING GYPSUM CEILING SHALL BE REMOVED TO ALLOW FOR REMOVAL OF EXISTING DUCTWORK, PIPING, EQUIPMENT, ETC., AND TO ALLOW FOR THE INSTALLATION OF NEW DUCTWORK, PIPING, EQUIPMENT, ETC.
H. WORK SHALL BE SCHEDULED TO MINIMIZE DURATION OF INTERRUPTIONS TO HEATING AND COOLING OF BUILDING SPACES.

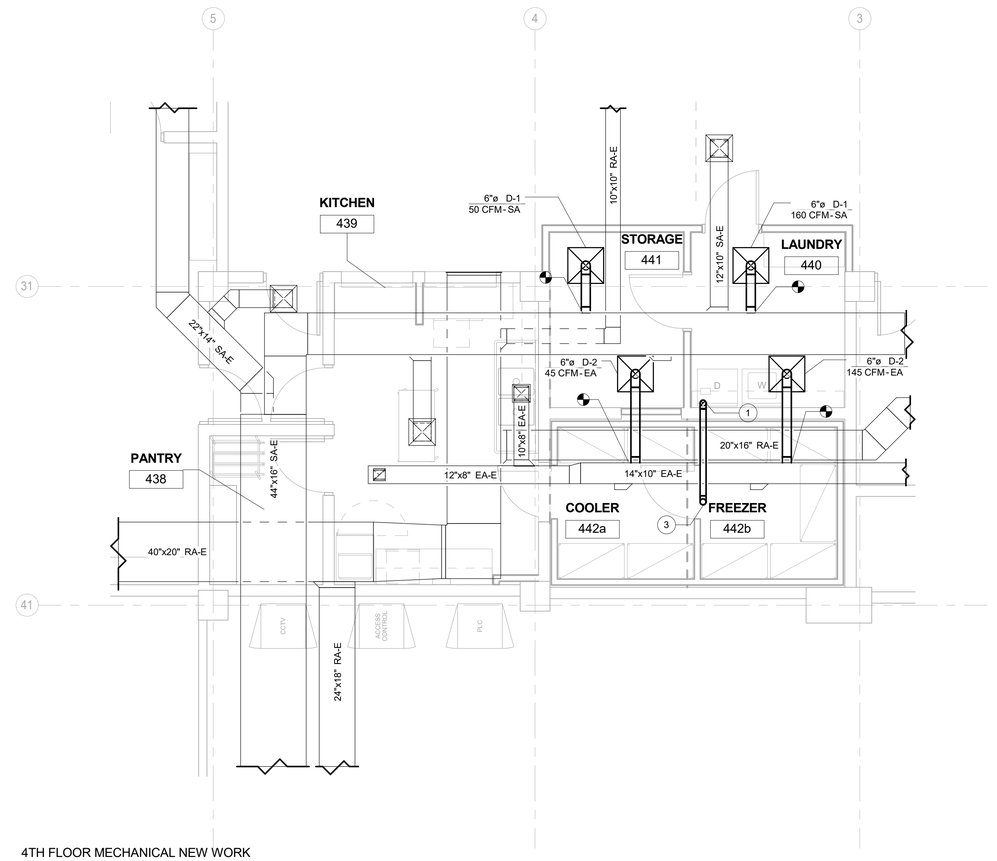
Keynote Legend	
Key Value	Keynote Text
1	4" DRYER EXHAUST UP TO ROOF
2	DEMOLISH EXISTING DIFFUSER ALONG WITH ASSOCIATED DUCTWORK. CAP DUCTWORK AT TAP.
3	NO SCREWS SHALL BE INSTALLED IN AIRSTREAM.

GENERAL MECHANICAL NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. IF BRANCH DUCT SIZE CONNECTED TO DIFFUSER OR GRILLE IS NOT LISTED, BRANCH DUCT SIZE SHALL MATCH COLLAR SIZE ON DIFFUSER OR GRILLE SERVED.
C. A BALANCING DAMPER SHALL BE PROVIDED ADJACENT TO EACH SUPPLY DIFFUSER/REGISTER, EXHAUST GRILLE, OR RETURN GRILLE.
D. COORDINATE LOCATIONS OF REGISTERS, GRILLES AND DIFFUSERS WITH CEILING LAYOUT. MAINTAIN MINIMUM CLEARANCE OF 3'-0" BETWEEN CEILING MOUNTED AIR INLETS/OUTLETS AND FIRE ALARM DETECTION DEVICES.



1 4TH FLOOR MECHANICAL DEMO PLAN - ENLRAGED PLAN
1/4" = 1'-0"



2 4TH FLOOR MECHANICAL NEW WORK PLAN - ENLARGED PLAN
1/4" = 1'-0"

REGISTERS, GRILLES & DIFFUSERS SCHEDULE

DESIGNATION	BASIS OF DESIGN		FACE SIZE	FACE TYPE	DESCRIPTION	MATERIAL	FINISH	MOUNTING	NOTES
	MANUFACTURER	MODEL							
D-1	TITUS	OMNI	24X24	LOUVERED	ARCHITECTUAL CEILING DIFFUSER	STEEL	WHITE	LAY-IN	1,2
G-1	TITUS	PAR	24X24	PERFORATED	PERFORATED CEILING RETURN DIFFUSER	STEEL	WHITE	LAY-IN	1,2

NOTES:
1. COLOR SHALL BE VERIFIED BY ARCHITECT.
2. COORDINATE FRAME TYPE REQUIRED WITH ADJACENT CEILING.

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

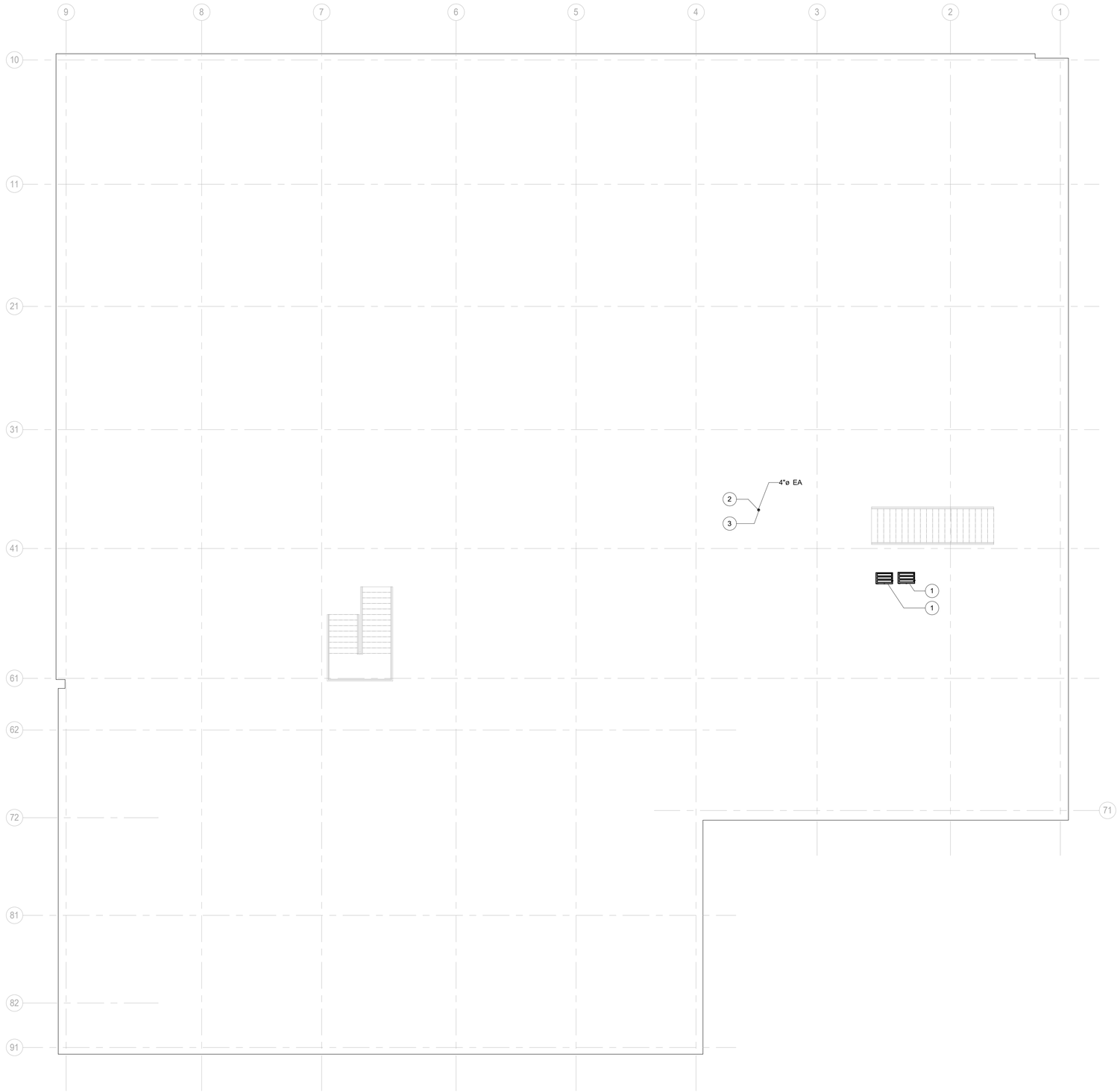
MARK	DATE	DESCRIPTIO

ISSUED 10/24/18

PROJECT 2018.033.00

4TH FLOOR MECHANICAL DEMO AND NEW WORK PLANS

M100



1 ROOF MECHANICAL NEW WORK PLAN
1/8" = 1'-0"

GENERAL MECHANICAL NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. IF BRANCH DUCT SIZE CONNECTED TO DIFFUSER OR GRILLE IS NOT LISTED, BRANCH DUCT SIZE SHALL MATCH COLLAR SIZE ON DIFFUSER OR GRILLE SERVED.
C. A BALANCING DAMPER SHALL BE PROVIDED ADJACENT TO EACH SUPPLY DIFFUSER/REGISTER, EXHAUST GRILLE, OR RETURN GRILLE.
D. COORDINATE LOCATIONS OF REGISTERS, GRILLES AND DIFFUSERS WITH CEILING LAYOUT. MAINTAIN MINIMUM CLEARANCE OF 3'-0" BETWEEN CEILING MOUNTED AIR INLETS/OUTLETS AND FIRE ALARM DETECTION DEVICES.

Keynote Legend	
Key Value	Keynote Text
1	CONDENSING UNIT SERVING WALK-IN COOLER/FREEZER ON FOURTH FLOOR.
2	DRYER EXHAUST. TERMINATE PER MANUFACTURER'S REQUIREMENTS.
3	NO SCREWS SHALL BE INSTALLED IN AIRSTREAM.

PRELIMINARY

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

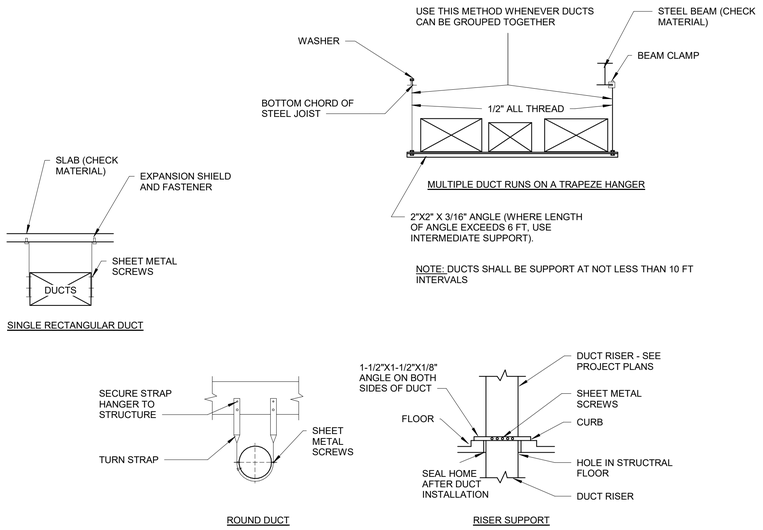
MARK	DATE	DESCRIPTIO

ISSUED 10/24/18

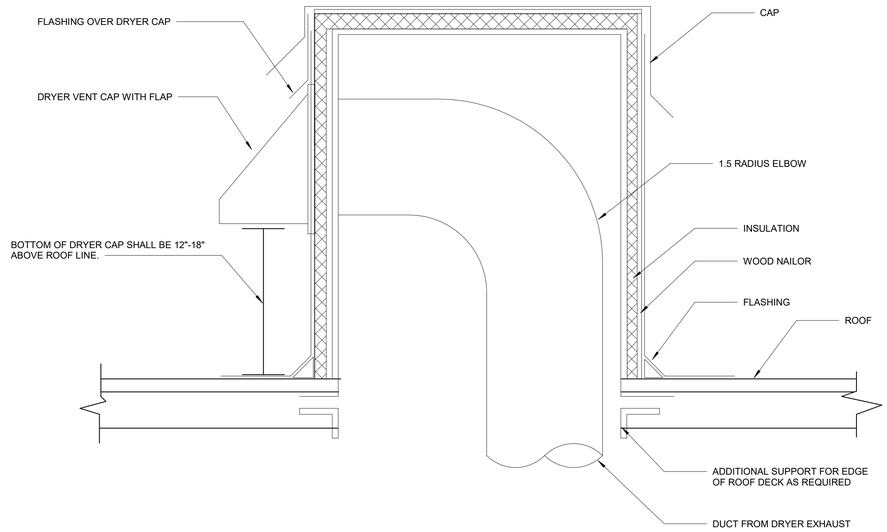
PROJECT 2018.033.00

ROOF MECHANICAL NEW WORK PLAN

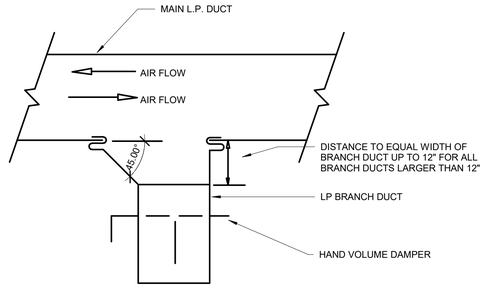
M101



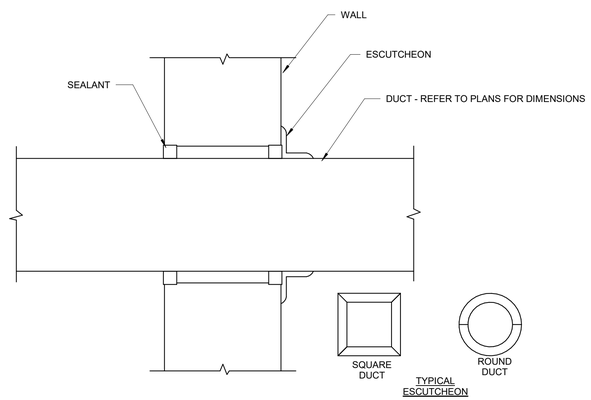
1 DUCT SUPPORT DETAIL
NOT TO SCALE



4 DRYER EXHAUST VENT DETAIL
1/2" = 1'-0"

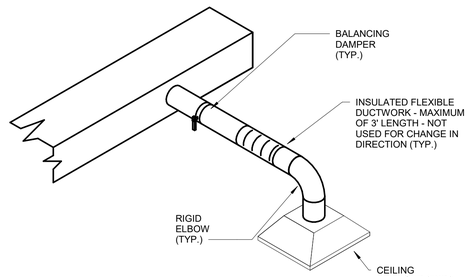


3 LOW PRESSURE DUCT TAKEOFF DETAIL
NOT TO SCALE

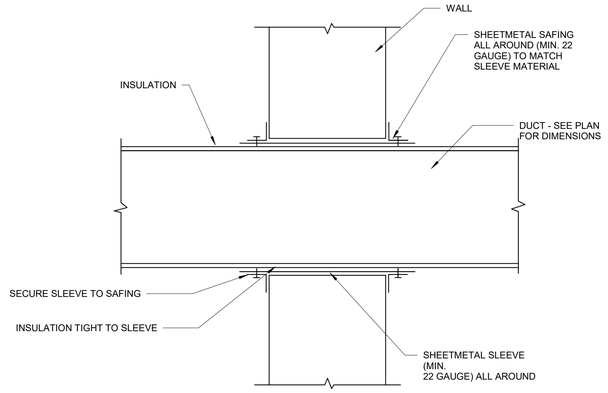


NOTES:
1. PROVIDE ESCUTCHEONS AT EXPOSED WALL OPENINGS.
2. ESCUTCHEON SHALL BE CONSTRUCTED OF SAME MATERIAL AND GAUGE AS DUCT.
3. ESCUTCHEON OUTSIDE DIMENSIONS SHALL BE EQUAL TO DUCT OUTSIDE DIMENSIONS PLUS 2"

5 WALL PENETRATION DETAIL- NON INSULATED DUCT
NOT TO SCALE



2 SUPPLY AIR TERMINAL CONNECTION DETAIL
NOT TO SCALE



NOTES:
1. INTERIOR WALLS REQUIRE SAFING ON ONE SIDE ONLY FOR CONCEALED DUCTS, BOTH SIDES OF WALL FOR EXPOSED DUCTS.
2. INSTALL CONNECTIONS BETWEEN SAFING AND SLEEVE TO PREVENT TEARING ON INSULATION JACKET

6 WALL PENETRATION DETAIL-INSULATED DUCT
NOT TO SCALE

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

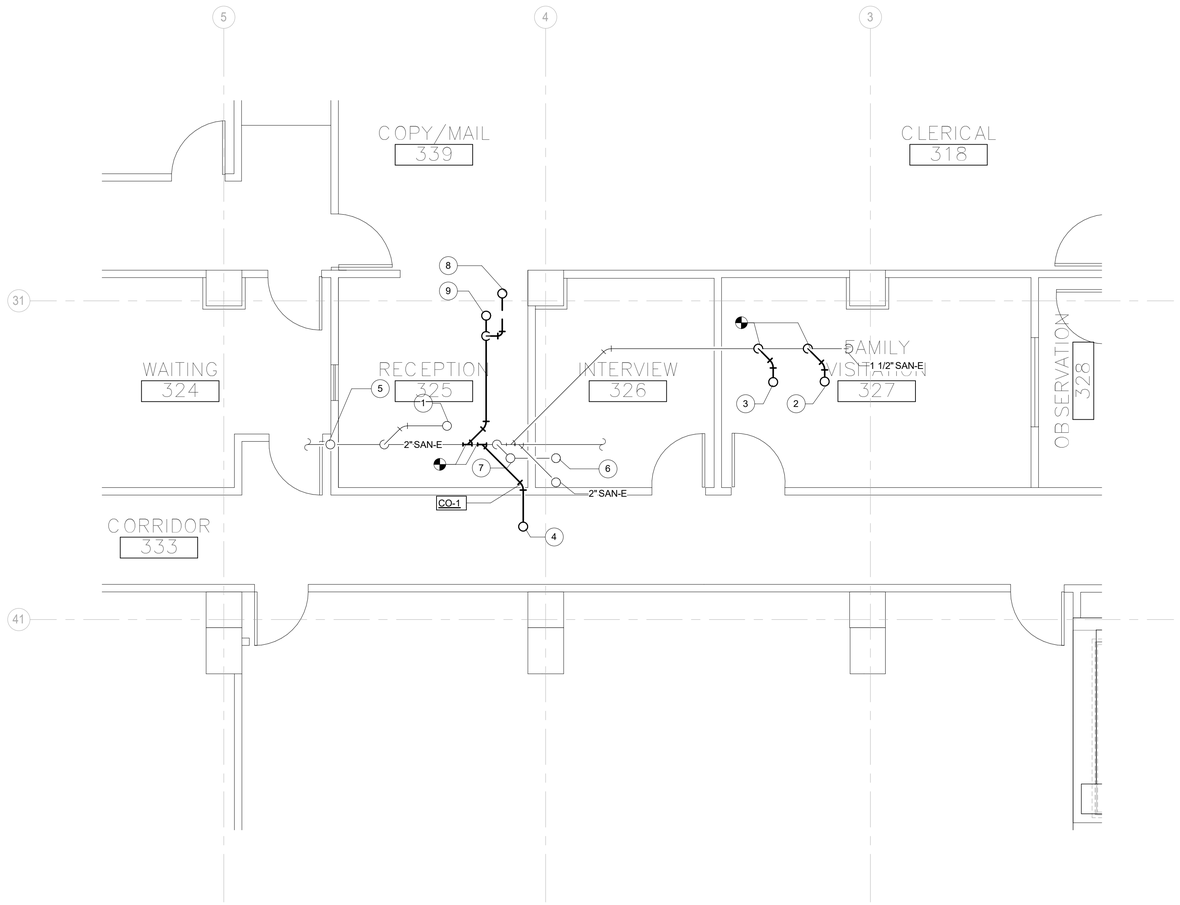
MARK	DATE	DESCRIPTIO

ISSUED 10/25/18

PROJECT 2018.033.00

MECHANICAL DETAILS

M700



1 3RD FLOOR PLUMBING NEW WORK PLAN - ENLARGED PLAN
1/4" = 1'-0"

GENERAL PLUMBING NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. ALL WORK SHALL BE PERFORMED IN A CLEAN WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
C. ALL WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH THE UNIFORM PLUMBING CODE, ALL LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
D. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH STANDARD PRACTICE AND THE UNIFORM PLUMBING CODE.
E. CONTRACTOR IS RESPONSIBLE FOR THE PROPER FLASHING OF PIPING PENETRATIONS THROUGH THE ROOF.
F. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ALL FEES AS REQUIRED.
G. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
H. CLEAN THE JOBSITE DAILY AND REMOVE ANY DIRT AND DEBRIS CAUSED BY WORK.
I. PROVIDE ALL TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN-ENDED.
J. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES.
K. PRIOR TO STARTING CONSTRUCTION, VERIFY EXACT INVERT ELEVATION, SIZE, DEPTH, AND LOCATION PRIOR TO WORK.
L. CONTRACTOR TO COORDINATE CONCRETE AREAS CUTTING PRIOR TO INSTALL.

Keynote Legend	
Key Value	Keynote Text
1	2" SAN-E UP TO FD-E
2	1-1/2" SAN UP TO S-2
3	1-1/2" SAN UP TO WMB-1
4	1-1/2" SAN UP TO S-1
5	2" V-E UP
6	1-1/2" V-E UP
7	2" SAN-E UP TO FS-E
8	1-1/2" VENT UP.
9	2" SAN UP TO FS-1.

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

ARCHITECT:
INVISION

303 WATSON POWELL JR.
SUITE
DES MOINES, IA
515-663-294
www.invisionarch.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTION

ISSUED: 01/10/2018
PROJECT 2018.033.00

3RD FLOOR PLUMBING NEW WORK PLAN

P100

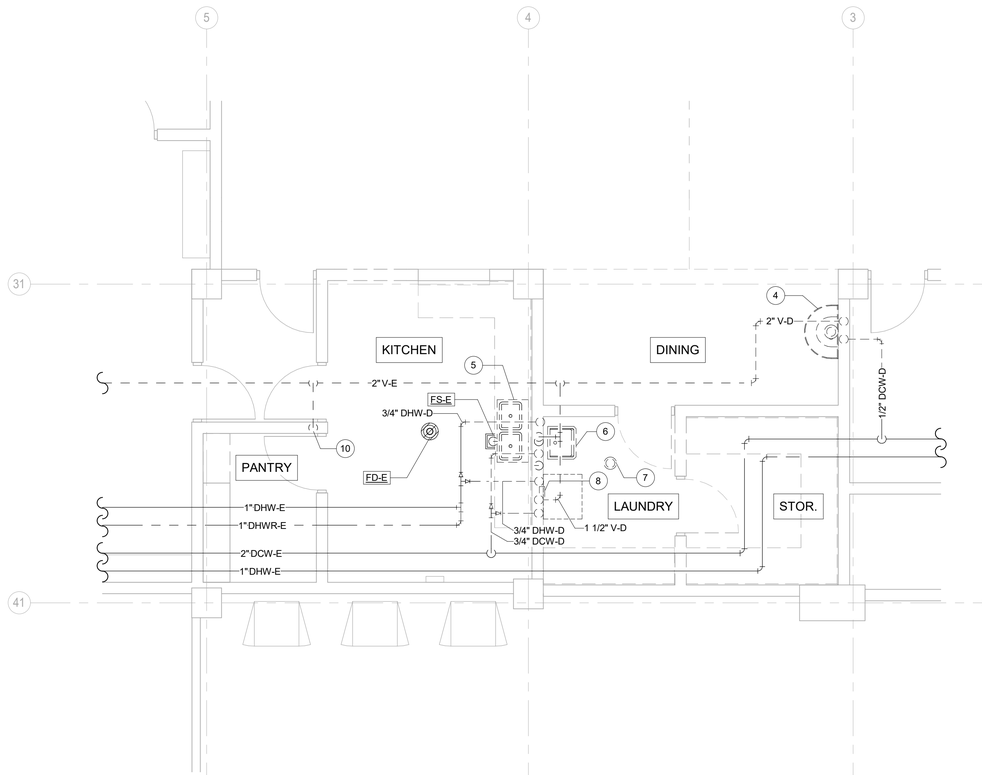
PLUMBING DEMOLITION NOTES:

A. IF SUSPICIOUS MATERIALS ARE ENCOUNTERED DURING COURSE OF PROJECT WORK, CONTRACTOR SHALL STOP WORK IMMEDIATLEY AND NOTIFY ARCHITECT, ENGINEER, AND OWNER.
B. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
C. ALL WORK SHALL BE SCHEDULED WITH OWNER, WITH MINIMUM OF TWO WEEK NOTICE PRIOR TO SYSTEM SHUT DOWNS.
D. REMOVE INDICATED SECTIONS OF PIPING, ALONG WITH ASSOCIATED INSULATION, SUPPORTS, ETC. IF RE-CONNECTION IS INDICATED, PREPARE REMAINING PIPING FOR CONNECTION TO NEW PIPING OR EQUIPMENT.
E. PATCH HOLES TO MATCH EXISTING WHERE PIPES AND DUCTS HAVE BEEN REMOVED.
F. EXISTING GYPSUM CEILING SHALL BE REMOVED TO ALLOW FOR REMOVAL OF EXISTING DUCTWORK, PIPING, EQUIPMENT, ETC., AND TO ALLOW FOR THE INSTALLATION OF NEW DUCTWORK, PIPING, EQUIPMENT, ETC.
G. WORK SHALL BE SCHEDULED TO MINIMIZE DURATION OF INTERRUPTIONS TO HEATING AND COOLING OF BUILDING SPACES.

Keynote Legend	
Key Value	Keynote Text
1	ROUTE 3/4" DCW TO INLET OF GARBAGE DISPOSAL.
2	3/4" DCW DN
3	3/4" DHW DN
4	DEMOLISH EXISTING WASH FOUNTAIN AND ASSOCIATED PIPING.
5	DEMOLISH EXISTING SINK.
6	DEMOLISH EXISTING LAUNDRY TUB.
7	DEMOLISH EXISTING FLOOR DRAIN. CAP SANITARY PIPING BENEATH FLOOR.
8	DEMOLISH EXISTING LAUNDRY BOX AND EXISTING WASHING MACHINE INCLUDE HOSE CONNECTIONS AND OTHER ASSOCIATED PIPING
9	ROUTE 1-1/2" SAN FROM SINK AND 2" SAN FROM GARBAGE DISPOSAL INTO EXISTING FLOOR SINK.
10	2" EXISTING VENT DOWN TO EXISTING WASTE PIPING
11	ROUTE CONDENSATE LINE TO UTILITY SINK S-2
12	VERIFY PIPE SIZE BASED ON MANUFACTURERS RECOMMENDATIONS.

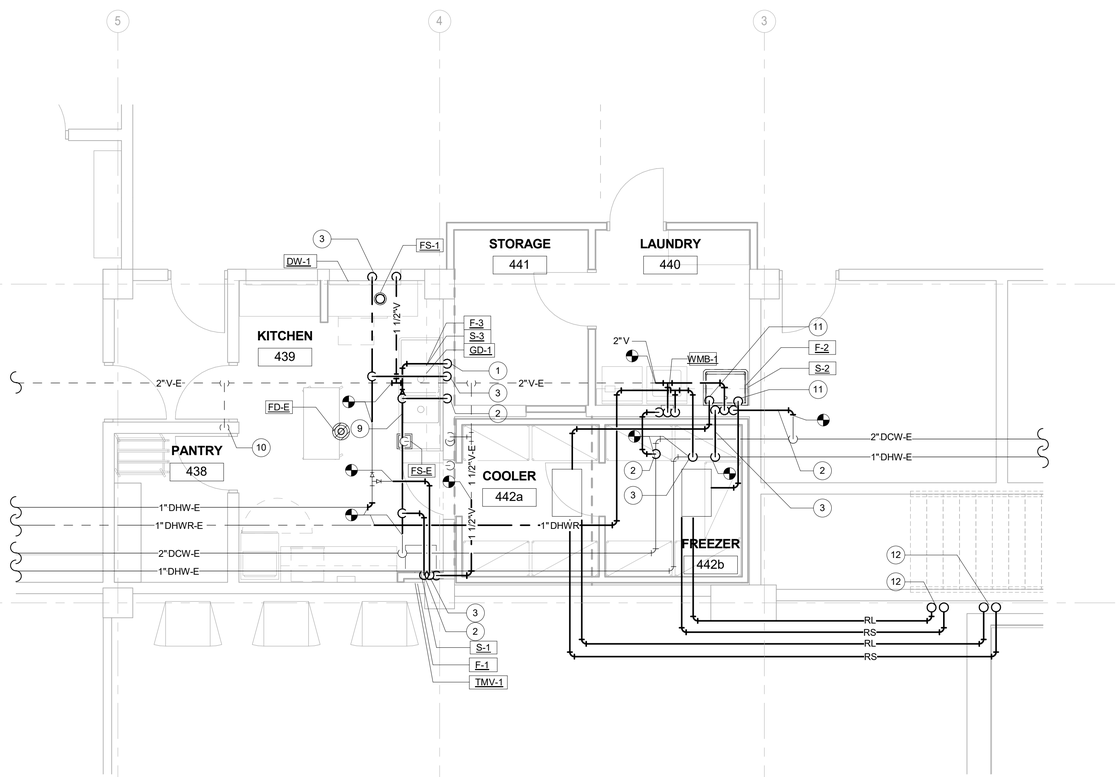
GENERAL PLUMBING NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. ALL WORK SHALL BE PERFORMED IN A CLEAN WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
C. ALL WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH THE UNIFORM PLUMBING CODE, ALL LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
D. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH STANDARD PRACTICE AND THE UNIFORM PLUMBING CODE.
E. CONTRACTOR IS RESPONSIBLE FOR THE PROPER FLASHING OF PIPING PENETRATIONS THROUGH THE ROOF.
F. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ALL FEES AS REQUIRED.
G. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
H. CLEAN THE JOBSITE DAILY AND REMOVE ANY DIRT AND DEBRIS CAUSED BY WORK.
I. PROVIDE ALL TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN-ENDED.
J. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES.
K. PRIOR TO STARTING CONSTRUCTION, VERIFY EXACT INVERT ELEVATION, SIZE, DEPTH, AND LOCATION PRIOR TO WORK.
L. CONTRACTOR TO COORDINATE CONCRETE AREAS CUTTING PRIOR TO INSTALL.



N

2 4TH FLOOR PLUMBING DEMO PLAN - ENLARGED PLAN
1/4" = 1'-0"



N

1 4TH FLOOR PLUMBING NEW WORK PLAN - ENLARGED PLAN
1/4" = 1'-0"

PRELIMINARY

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

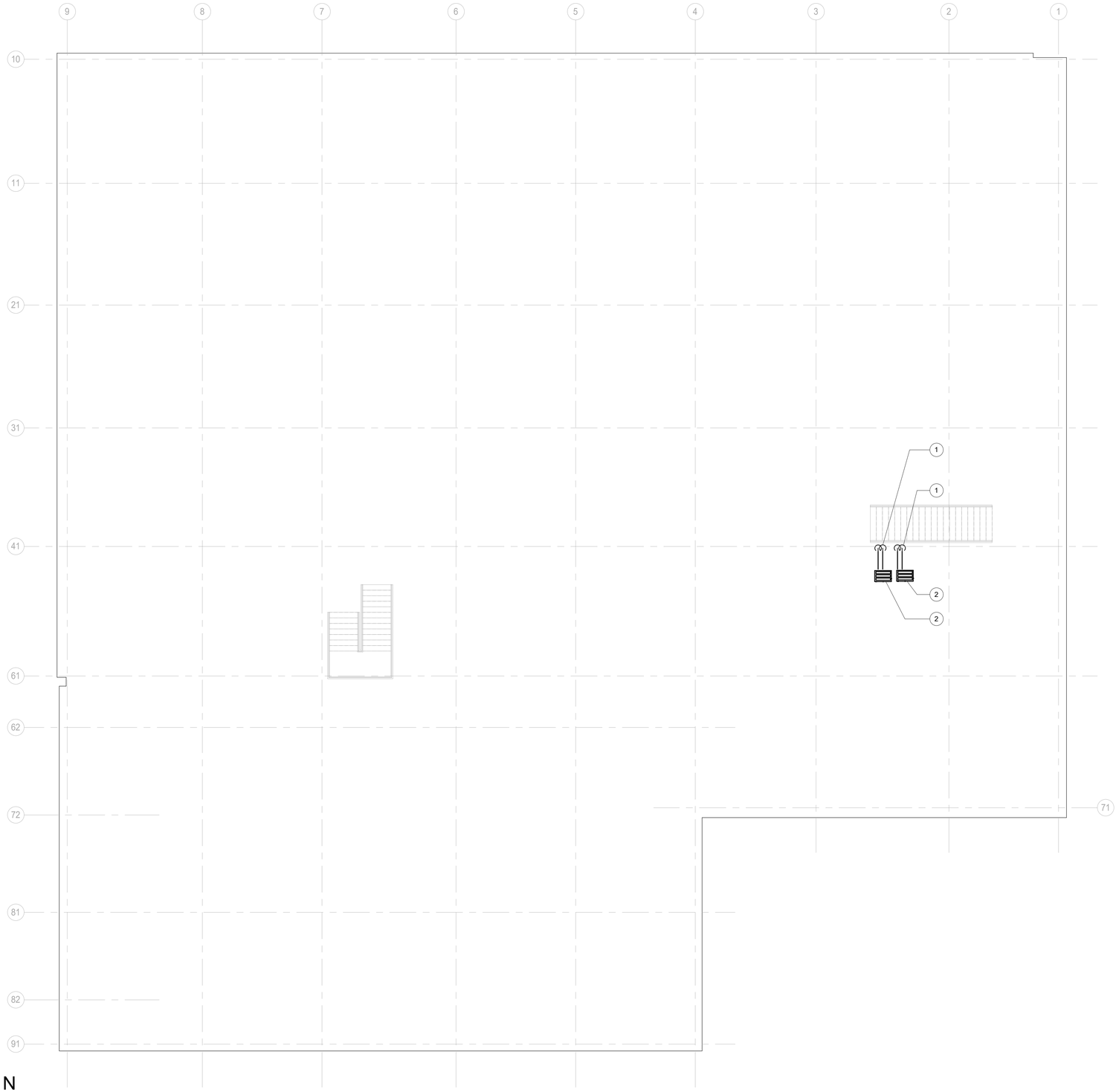
MARK	DATE	DESCRIPTIO

ISSUED 10/22/18

PROJECT 2018.033.00

4TH FLOOR PLUMBING DEMO AND NEW WORK PLANS

P101



N

1 ROOF PLUMBING NEW WORK PLAN
1/8" = 1'-0"

GENERAL PLUMBING NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. ALL WORK SHALL BE PERFORMED IN A CLEAN WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
C. ALL WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH THE UNIFORM PLUMBING CODE, ALL LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
D. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH STANDARD PRACTICE AND THE UNIFORM PLUMBING CODE.
E. CONTRACTOR IS RESPONSIBLE FOR THE PROPER FLASHING OF PIPING PENETRATIONS THROUGH THE ROOF.
F. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ALL FEES AS REQUIRED.
G. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
H. CLEAN THE JOBSITE DAILY AND REMOVE ANY DIRT AND DEBRIS CAUSED BY WORK.
I. PROVIDE ALL TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN-ENDED.
J. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES.
K. PRIOR TO STARTING CONSTRUCTION, VERIFY EXACT INVERT ELEVATION, SIZE, DEPTH, AND LOCATION PRIOR TO WORK.
L. CONTRACTOR TO COORDINATE CONCRETE AREAS CUTTING PRIOR TO INSTALL.

Keynote Legend	
Key Value	Keynote Text
1	VERIFY PIPE SIZE BASED ON MANUFACTURERS RECOMMENDATIONS.
2	CONDENSING UNIT SERVING WALK-IN COOLER/FREEZER ON FOURTH FLOOR.

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

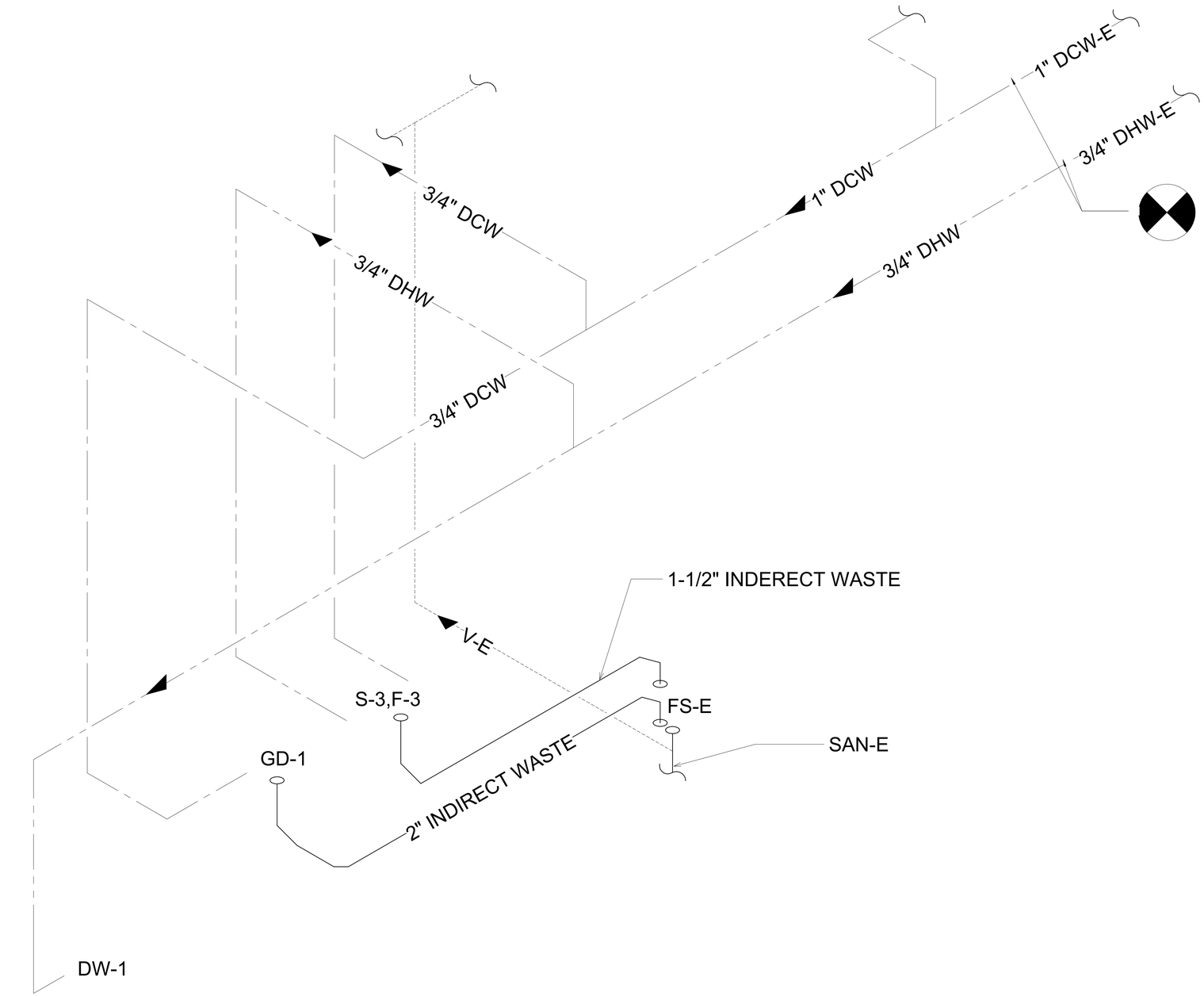
MARK	DATE	DESCRIPTIO

ISSUED 10/22/18

PROJECT 2018.033.00

ROOF PLUMBING NEW WORK PLAN

P102



1 SINK AND GARBAGE DISPOSAL PIPIONG
ISOMETRIC
NOT TO SCALE

PRELIMINARY

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

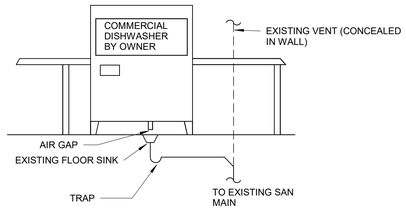
MARK	DATE	DESCRIPTIO

ISSUED 10/22/18

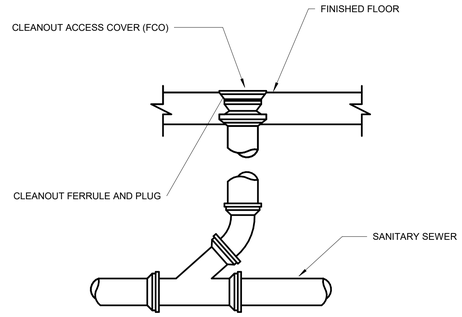
PROJECT 2018.033.00

KITCHEN PLUMBING ISOMETRIC

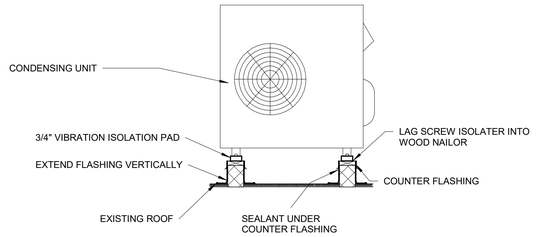
P500



1 COMMERCIAL DISHWASHER DRAINAGE PIPING DETAIL
NOT TO SCALE

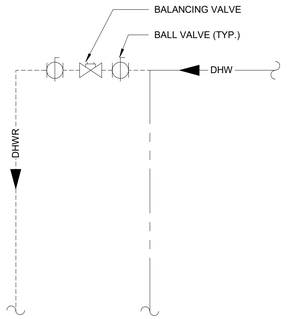


2 FLOOR CLEANOUT DETAIL
NOT TO SCALE



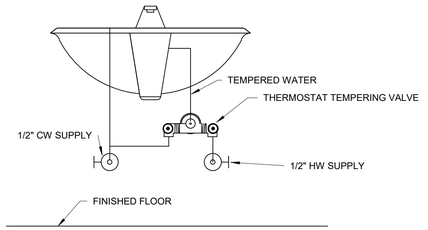
NOTES:
1. ALL ROOFING WORK SHALL BE COMPLETED TO MAINTAIN EXISTING ROOF WARRANTY.

3 ROOF RAIL DETAIL
NOT TO SCALE

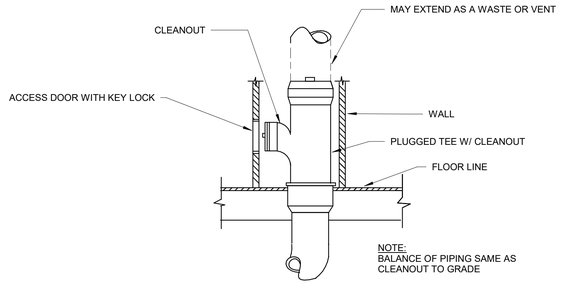


NOTE:
1. ALL VALVES SHALL BE LEAD FREE.
2. SET BALANCING DEVICE TO MAINTAIN MINIMUM FLOW FOR RECIRCULATING.

4 DOMESTIC HOT WATER RECIRC DETAIL
NOT TO SCALE

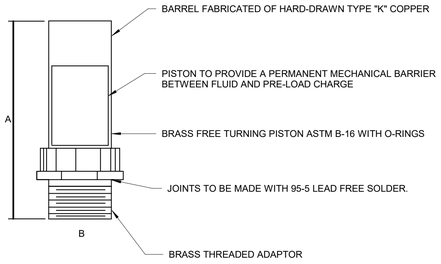


5 LOCAL MIXING VALVE DETAIL
NOT TO SCALE



NOTE:
BALANCE OF PIPING SAME AS CLEANOUT TO GRADE

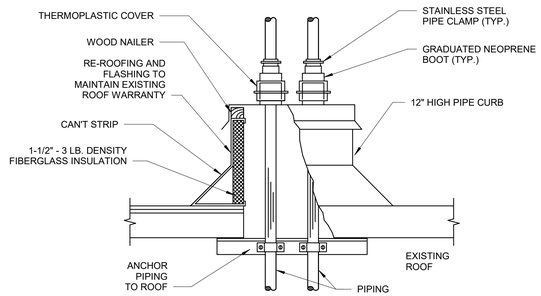
6 WALL CLEANOUT DETAIL
NOT TO SCALE



PPP SIZE	PDI SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1-11	5"	1/2"
3/4"	B	12-32	5"	3/4"
1"	C	33-60	7"	1"
1-1/4"	D	61-113	7"	1-1/4"
1-1/2"	E	114-154	9"	1-1/2"
2"	F	155-330	9"	2"

NOTE:
SEE WATER RISER DIAGRAMS FOR LOCATIONS OF SHOCK ABSORBERS

7 WATER HAMMER ARRESTOR DETAIL
NOT TO SCALE



PIPE ROOF PENETRATION WITH CURB DETAIL
1/2" = 1'-0"

8

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTIO

ISSUED 10/22/18

PROJECT 2018.033.00

PLUMBING DETAILS

P700

PLUMBING FIXTURE SCHEDULE

DESIGNATION	DESCRIPTION	BASIS OF DESIGN		DCW CONNECTIONS (QUANTITY)	DCW CONNECTION SIZE (IN.)	DHW CONNECTIONS (QUANTITY)	DHW CONNECTION SIZE (IN.)	DRAIN CONNECTIONS (QUANTITY)	DRAIN CONNECTION SIZE (IN.)	NOTES
		MANUFACTURER	MODEL							
S-1	HANDWASH SINK	ELKAY	EWS2520	N/A	N/A	N/A	N/A	1	1 1/2	1
S-2	UTILITY SINK	ELKAY	B1C24X24X	N/A	N/A	N/A	N/A	1	1 1/2	1
S-3	DOUBLE BOWL KITCHEN SINK	EAGLE GROUP	SPEC MASTER FN	N/A	N/A	N/A	N/A	1	1 1/2	1
F-1	MANUAL GOOSENECK WITH WRISTBLADE HANDLES	ELKAY	LK940GN05T4H	1	1/2	1	1/2	N/A	N/A	
F-2	MANUAL GOOSENECK WITH WRISTBLADE HANDLES	ELKAY	LK940GN05T4H	1	1/2	1	1/2	N/A	N/A	
F-3	PRE-RINSE FAUCET	T&S	B-0131-C	1	1/2	1	1/2	N/A	N/A	
FS-1	FLOOR SINK	ZURN	Z1960	N/A	N/A	N/A	N/A	1	2	
CO-1	CLEAN OUT	ZURN	Z1400-B	N/A	N/A	N/A	N/A	1	SEE PLANS	
WMB-1	1/4 TURN WASHING MACHINE BOX WITH DRAIN	GUY GRAY - IPS CORP.	SSWB1	1	1/2	1	1/2	1	2	
GD-1	FOODWASTE DISPOSER	HOBART	FD4/200	1	3/4	N/A	N/A	1	2	
DW-1	UNDERCOUNTER CHEMICAL DISHWASHER	HOBART	LXEC-3	N/A	N/A	1	3/4	1	1 1/2	

NOTES:
1. SEE ASSOCIATED FAUCET FOR INFORMATION ON WATER SUPPLY CONNECTIONS.

FAUCET SCHEDULE

DESIGNATION	DESCRIPTION	BASIS OF DESIGN		SERVICE	OPERATION	SPOUT TYPE	HANDLE TYPE	AUTOMATIC POWER SOURCE	MIXING VALVE TYPE	FINISH	DCW CONNECTION SIZE (IN.)	DHW CONNECTION SIZE (IN.)	MAXIMUM FLOW RATE (GPM)	MOUNTING LOCATION	MOUNTING CENTERS (IN.)	ADA COMPLIANT	NOTES
		MANUFACTURER	MODEL														
F-1	MANUAL GOOSENECK WITH WRISTBLADE HANDLES	ELKAY	LK940GN05T4H	S-1	MANUAL	GOOSENECK	WRISTBLADE	N/A	N/A	POLISHED CHROME	1/2	1/2	1.5	DECK	8	YES	1
F-2	MANUAL GOOSENECK WITH WRISTBLADE HANDLES	ELKAY	LK940GN05T4H	S-1	MANUAL	GOOSENECK	WRISTBLADE	N/A	N/A	POLISHED CHROME	1/2	1/2	1.5	DECK	8	YES	1
F-3	PRE-RINSE FAUCET	T&S	B-0131-C	S-3													2

NOTES:
1. COORDINATE FAUCET WITH SINK, LAVATORY, OR SURFACE ON WHICH IT SHALL BE MOUNTED.
2. OWNER FURNISHED, CONTRACTOR INSTALLED

THERMOSTATIC MIXING VALVE ASSEMBLY SCHEDULE

DESIGNATION	DESCRIPTION	LOCATION	BASIS OF DESIGN		SERVICE	TYPE	MAXIMUM FLOW (GPM)	LEAVING TEMP (°F)	MINIMUM FLOW (GPM)	DCW INLET PIPING CONNECTION DIAMETER (IN.)	DHW INLET PIPING CONNECTION DIAMETER (IN.)	DHWR INLET PIPING CONNECTION DIAMETER (IN.)	ELECTRICAL DATA			NOTES
			MANUFACTURER	MODEL									VOLTAGE	PHASE	FLA	
TMV-1	MIXING VALVE	S-1	LAWLER	570	DOMESTIC HOT WATER - LAVATORY	THERMOSTATIC MIXING VALVE FOR POINT OF USE	10	110	0.5	1/2	1/2	-	-	-	-	-

NOTES:

FLOOR SINK SCHEDULE

DESIGNATION	BASIS OF DESIGN		BODY	DIAMETER (IN.)	DEPTH (IN.)	GRATE TYPE	STRAINER	DRAIN CONNECTION SIZE (IN.)	DRAIN OUTLET LOCATION	MIN. VENT CONNECTION SIZE (IN.)	NOTES
	MANUFACTURER	MODEL									
FS-1	ZURN	Z1960	PORCELAIN COATED CAST IRON	8	6	FULL W/CENTER OPENING	ABS	2	BOTTOM	1 1/2	1

NOTES:
1. UNIT TO BE PROVIDED WITH REMOVABLE STAINLESS-STEEL CATCH BASKET

SINK SCHEDULE

DESIGNATION	BASIS OF DESIGN		MATERIAL	BOWLS	OVERALL WIDTH (IN.)	OVERALL LENGTH (IN.)	DEPTH (IN.)	DRAIN CONNECTION SIZE (IN.)	VENT CONNECTION SIZE (IN.)	FAUCET TYPE	FAUCET QUANTITY	ADA COMPLIANT	NOTES
	MANUFACTURER	MODEL											
S-1	ELKAY	EWS2520	STAINLESS STEEL	1	25	19 1/2	10 1/2	1 1/2	1 1/4	F-1	1	YES	1,2
S-2	ELKAY	B1C24X24X	STAINLESS STEEL	1	24	24	12	1 1/2	1 1/4	F-2	1	YES	1,2
S-3	EAGLE GROUP	SPEC MASTER FN								F-3			3

NOTES:
1. PROVIDE SINK WITH STRAINER AND TAILPIECE TO MATCH.
2. COORDINATE DRILLINGS FOR ASSOCIATED FAUCET AND ACCESSORIES AS IDENTIFIED ON FAUCET SCHEDULE.
3. ONWER-FURNISHED, CONTRACTOR INSTALLED.

CLEAN-OUT SCHEDULE

DESIGNATION	BASIS OF DESIGN		BODY MATERIAL	STRAINER DIAMETER (IN.)	STRAINER MATERIAL	ADA COMPLIANT GRATE	DRAIN CONNECTION SIZE (IN.)	DRAIN OUTLET LOCATION	VENT CONNECTION SIZE (IN.)	NOTES
	MANUFACTURER	MODEL								
CO-1	ZURN	Z1400-B	COATED CAST IRON	VARIES	NICKEL BRONZE	YES	SEE PLANS	FLOOR	N/A	1

NOTES:
1. UNIT SHALL INCLUDE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE HOLES/SLOTS.

ICE MAKER BOX SCHEDULE

DESIGNATION	BASIS OF DESIGN		DCW CONNECTION SIZE (IN.)	DHW CONNECTION SIZE (IN.)	DRAIN CONECTION SIZE (IN.)	VALVE TYPE	BOX AND FACEPLATE MATERIAL	NOTES
	MANUFACTURER	MODEL						
WMB-1	GUY GRAY - IPS CORP.	SSWB1	1/2	1/2	2	QUARTER TURN	STAINLESS STEEL	

NOTES:

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTIO

ISSUED 10/22/18

PROJECT 2018.033.00

PLUMBING SCHEDULES

P800

ELECTRICAL ABBREVIATIONS

A - AMPERES
AC - ABOVE CEILING/ALTERNATING CURRENT
ADO - AUTOMATIC DOOR OPENER
AF - AMPERE FRAME
AFF - ABOVE FINISHED FLOOR
AIC - AMP INTERRUPTING CAPACITY
AL - ALUMINUM
ALT - ALTERNATE
ARCH - ARCHITECTURAL
ASC - ABOVE SUSPENDED CEILING
AT - AMPERE TRIP
ATS - AUTOMATIC TRANSFER SWITCH
AUTO - AUTOMATIC
BAS - BUILDING AUTOMATION SYSTEM
BATS - BYPASS AUTOMATIC TRANSFER SWITCH
BC - BARE COMMPER
BFC - BELOW FINISHED CEILING
BFL - BELOW FLOOR LEVEL
BLDG - BUILDING
BPIP - BOILER PLANT INSTRUMENTATION PANEL
BRKR - BREAKER
C - CONDUIT
CB - CIRCUIT BREAKER
CCTV - CLOSED CIRCUIT TELEVISION
CCT - CIRCUIT
CCT BKR - CIRCUIT BREAKER
CFCI - CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
CLG - CEILING
CO - CONDUIT ONLY
CONTR - CONTRACTOR
CORR - CORRIDOR
CR - CONTROL RELAY
CT - CURRENT TRANSFORMER
DB - DIRECT BURIAL
DC - DIRECT CURRENT
DED - DEDICATED
DET - DETAIL
DIA - DIAMETER
DISC - DISCONNECT
DN - DOWN
DP - DISTRIBUTION PANEL
DS - DISCONNECT SWITCH
EC - ELECTRICAL CONTRACTOR
ECL - EMERGENCY CRITICAL LIGHTING
ECP - EMERGENCY CRITICAL POWER
EDB - ELECTRIC DUCT BANK
EG - EQUIPMENT GROUND
EGS - ENGINE GENERATOR SET
EJ - EXPANSION JOINT
ELEC - ELECTRIC/ELECTRICAL
ELL - EMERGENCY LIFE SAFETY LIGHTING
ELP - EMERGENCY LIFE SAFETY POWER
EMER - EMERGENCY
EMI - ELECTROMAGNETIC INTERFERENCE
EMT - ELECTRICAL METALLIC TUBING
EQUIP - EQUIPMENT
ESM - ELECTRIC STRIP MOLD
ETR - EXISTING TO REMAIN
EWC - ELECTRIC WATER COOLER
F/FC - FLUSH WITH FINISHED CEILING
F/FF - FLUSH WITH FINISHED FLOOR
F/FW - FLUSH WITH FINISHED WALL
FA - FIRE ALARM
FACP - FIRE ALARM CONTROL PANEL
FCU - FAN COIL UNIT
FDR - FEEDER
FDS - FUSED DISCONNECT SWITCH
FI - FILM ILLUMINATOR
FIXT - FIXTURE
FL - AT FLOOR LINE
FLA - FULL LOAD AMPERES
FLEX - FLEXIBLE
FLR - FLOOR
FLUOR - FLUORESCENT
FS - FLOW SWITCH
FSS - FUSED SAFETY SWITCH
FSCP - FLAME SAFEGUARD CONTROL PANEL
FVNR - FULL VOLTAGE NON REVERSING
GC - GENERAL CONTRACTOR
GFCI - GROUND FAULT CURRENT INTERRUPTER
GFP - GROUND FAULT PROTECTOR
GND - GROUND
GEN - GENERATOR
GFI - GROUND FAULT INTERRUPTER
GFCI - GROUND FAULT CURRENT INTERRUPTER
GRC - GALVANIZED RIGID CONDUIT
GTB - GROUND TERMINAL BOX
HH - HANDHOLE
HOA - HAND OFF AUTOMATIC
HP - HORSE POWER
HT - HEIGHT/HEAT TRACE
HV - HIGH VOLTAGE
IG - ISOLATED GROUND
IMC - INTERMEDIATE METAL CONDUIT
INCAND - INCANDESCENT

JB - JUNCTION BOX
KO - KNOCK-OUT
KV - KILOVOLT
KVA - KILOVOLT-AMPERES
KW - KILOWATTS
KWH - KILOWATT HOURS
LAN - LOCAL AREA NETWORK
LGT - LIGHT
LTCP - LOCAL TEMPERATURE CONTROL PANEL
LTG - LIGHTING
LTS - LIGHTS
LV - LOW VOLTAGE
MATV - MASTER ANTENNA TELEVISION
MC - MECHANICAL CONTRACTOR
MCB - MAIN CIRCUIT BREAKER
MCC - MOTOR CONTROL CENTER
MCP - MOTOR CIRCUIT PANEL
MDP - MAIN DISTRIBUTION PANEL
MER - MECHANICAL EQUIPMENT ROOM
MLO - MAIN LUGS ONLY
MH - MANHOLE
MPTB - MUSIC & PAGE TERMINAL BOX
MTD - MOUNTED
MTG - MOUNTING
MTG HGT - MOUNTING HEIGHT
MTR - MOTOR/METER
NA - NOT APPLICABLE
NC - NEW CONNECTION/NORMALLY CLOSED
NFD - NON-FUSED DISCONNECT
NFSS - NON FUSED SAFETY SWITCH
NIC - NOT IN CONTRACT
NO - NORMALLY OPEN
NTS - NOT TO SCALE
OC - ON CENTER
OFCI - OWNER FURNISHED CONTRACTOR INSTALLED
OFOI - OWNER FURNISHED OWNER INSTALL
P - POLE
PA - PUBLIC ADDRESS
PB - PULL BOX
PBPU - PREFABRICATED BEDSIDE PATIENT POWER UNIT
PC - PLUMBING CONTRACTOR/PHOTOCELL
PDU - POWER DISTRIBUTION UNIT
PF - POWER FACTOR
PH - PHASE
PLBG - PLUMBING
PNL - PANEL
POD - POWER OPERATED DAMPER
PT - POTENTIAL TRANSFORMER
PTRV - POWER TYPE ROOF VENTILATOR
PWR - POWER
REC - RECESSED
RECEP - RECEPTACLE
REL - RELOCATE
REQD - REQUIRED
RGIP - REMOTE GROUND INDICATOR PANEL
RVAT - REDUCED VOLTAGE AUTO TRANSFORMER
SHT - SHEET
SIG - SIGNAL
SIM - SIMILAR
SIO - STANDARD INFORMATION SHEET
SPEC - SPECIFICATION
SS - SAFETY SWITCH
STA - STATION
STR - STARTER
SW - SWITCH
SWBD - SWITCHBOARD
SWGR - SWITCHGEAR
TEL - TELEPHONE
TFA - TO FLOOR ABOVE
TFB - TO FLOOR BELOW
TGB - TELECOMMUNICATION GROUND BAR
TS - TAMPER SWITCH/TIME SWITCH
TV - TELEVISION
TVSS - TRANSIENT VOLTAGE SURGE SUPPRESSION
TVTC - TELEVISION TERMINAL CABINET
TYP - TYPICAL
UC - UNDER COUNTER
UG - UNDERGROUND
UH - UNIT HEATER
UON - UNLESS NOTED OTHERWISE
UPS - UNINTERRUPTED POWER SUPPLY
V - VOLTAGE
VFD - VARIABLE FREQUENCY DRIVE
VP - VAPOR PROOF
W - WIRE
W/ - WITH
WP - WEATHERPROOF
WS - WALL SURFACE
WT - WATER TIGHT
X - EXISTING
XFMR - TRANSFORMER
XP - EXPLOSION PROOF

ELECTRICAL SYMBOLS

NON-FUSED DISCONNECT SWITCH
FUSED DISCONNECT SWITCH
COMBINATION MOTOR STARTER
MAGNETIC MOTOR STARTER
MANUAL STARTER WITH OVERCURRENT PROTECTION
MOTOR LOAD

ELECTRICAL PANEL - SURACE MOUNTED
ELECTRICAL PANEL - FLUSH MOUNTED
SURFACE JUNCTION BOX - WALL
SURFACE JUNCTION BOX - CEILING
RECESSED JUNCTION BOX - CEILING

LIGHTING

TYPE
CIRCUIT/SWITCH

RECESSED LED MOUNTING LOCATION: CEILING
RECESSED MOUNTED LED EMERGENCY MOUNTING LOCATION: CEILING
WALL MOUNTED LINEAR FIXTURE MOUNTING HEIGHT: CEILING
WALL MOUNTED LINEAR FIXTURE EMERGENCY MOUNTING HEIGHT: CEILING
SINGLE FACE EXIT FIXTURE MOUNTING LOCATION: CEILING
DOUBLE FACE EXIT FIXTURE MOUNTING LOCATION: CEILING
DOUBLE HEAD EMERGENCY FIXTURE MOUNTING LOCATION: WALL MOUNTING HEIGHT: SEE NOTE 1.

RECESSED GRID MOUNTED MOUNTING LOCATION: CEILING
RECESSED GRID MOUNTED EMERGENCY MOUNTING LOCATION: CEILING
PENDANT/SUSPENDED LINEAR FIXTURE MOUNTING HEIGHT: AS NOTED
PENDANT/SUSPENDED LINEAR FIXTURE EMERGENCY MOUNTING HEIGHT: AS NOTED
RECESSED MOUNTED LINEAR FIXTURE MOUNTING HEIGHT: CEILING
EXIT DIRECTIONAL ARROW
SINGLE FACE EXIT FIXTURE MOUNTING LOCATION: WALL
DOUBLE FACE EXIT FIXTURE MOUNTING LOCATION: WALL

SWITCHES

SINGLE POLE SWITCH MOUNTING LOCATION: WALL MOUNTING HEIGHT: 3'-6" a = SWITCH DESIGNATION
THREE WAY SWITCH MOUNTING LOCATION: WALL MOUNTING HEIGHT: 3'-6" LV = LOW VOLTAGE
FOUR WAY SWITCH MOUNTING LOCATION: WALL MOUNTING HEIGHT: 3'-6"
DIMMER SWITCH MOUNTING LOCATION: WALL MOUNTING HEIGHT: 3'-6"

OCCUPANCY SENSOR FOR LIGHTING CONTROL, WALL MOUNTED DT = DUAL TECHNOLOGY MOUNTING LOCATION: WALL MOUNTING HEIGHT: 3'-6"
OCCUPANCY SENSOR FOR LIGHTING CONTROL, CEILING MOUNTED DT = DUAL TECHNOLOGY

SECURITY

COMMUNICATIONS

WALL TELEPHONE OUTLET MOUNTING LOCATION: WALL MOUNTING HEIGHT: 4'-0"
TELE/DATA OULETS MOUNTING LOCATION: WALL MOUNTING HEIGHT: 4'-0"
CLOSED CIRCUIT CAMERA MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED
TELE/DATA OULETS MOUNTING LOCATION: FLOOR

CLOCK MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED
INTERCOM STATION MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED
MICROPHONE OULET W/ JACK MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
SPEAKER MOUNTING LOCATION: CEILING
AMPLIFIER MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED

FIRE ALARM

FIRE ALARM PULL STATION MOUNTING LOCATION: WALL MOUNTING HEIGHT: 4'-0"
FIRE ALARM HORN/STROBE MOUNTING LOCATION: WALL MOUNTING HEIGHT: SEE NOTE 1
FIRE ALARM SMOKE DETECTOR MOUNTING LOCATION: CEILING
FIRE ALARM REMOTE INDICATOR TEST SWITCH FOR AHUs MOUNTING LOCATION: WALL
FIRE ALARM TAMPER SWITCH MOUNTING LOCATION: SPRINKLER PIPE MOUNTING HEIGHT: FIELD LOCATE

FIRE ALARM CONTROL PANEL MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED
FIRE ALARM ANNUCIATOR PANEL MOUNTING LOCATION: WALL MOUNTING HEIGHT: AS NOTED
FIRE ALARM HEAT DETECTOR MOUNTING LOCATION: CEILING
FIRE ALARM DUCT SMOKE DETECTOR MOUNTING LOCATION: DUCT
COMBINATION FIRE SMOKE DAMPER MOUNTING LOCATION: DUCT
FIRE ALARM WATERFLOW SWITCH MOUNTING LOCATION: SPRINKLER PIPE MOUNTING HEIGHT: FIELD LOCATE

NOTES:
80" AFF TO BOTTOM OF FACEPLATE OR 6" FROM TOP OF FACE TO BOTTOM OF CEILING, WHICHEVER IS LOWER.

RECEPTACLES

DUPLEX RECEPTACLE MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
EMERGENCY DUPLEX RECEPTACLE MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
DOUBLE DUPLEX RECEPTACLE MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
DOUBLE DUPLEX RECEPTACLE - ABOVE CASEWORK OR 2" ABOVE COUNTERTOP BACKSPLASH MOUNTING LOCATION: WALL MOUNTING HEIGHT: FIELD VERIFY

DUPLEX RECEPTACLE UPPER HALF SWITCHED MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
FIXED EQUIPMENT CONNECTION MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
POWER OUTLET MOUNTING LOCATION: WALL MOUNTING HEIGHT: 1'-6"
DUPLEX RECEPTACLE PC = PENDANT CORD-CONNECTOR DEVICE MOUNTING LOCATION: CEILING
DUPLEX RECEPTACLE MOUNTING LOCATION: FLOOR

SHEETS SYMBOLS

1 NOTE DESIGNATION
NEW WORK CONNECTION TO EXISTING WORK DESIGNATION
1 / M100 SECTION VIEW
EQ 1 EQUIPMENT DESIGNATION TOP DENOTES EQUIPMENT ABBREVIATION BOTTOM DENOTES EQUIPMENT NUMBER

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC
3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTIO

ISSUED 10/29/18
PROJECT 2018.033.00

ELECTRICAL SYMBOLS AND ABBREVIATIONS

E0

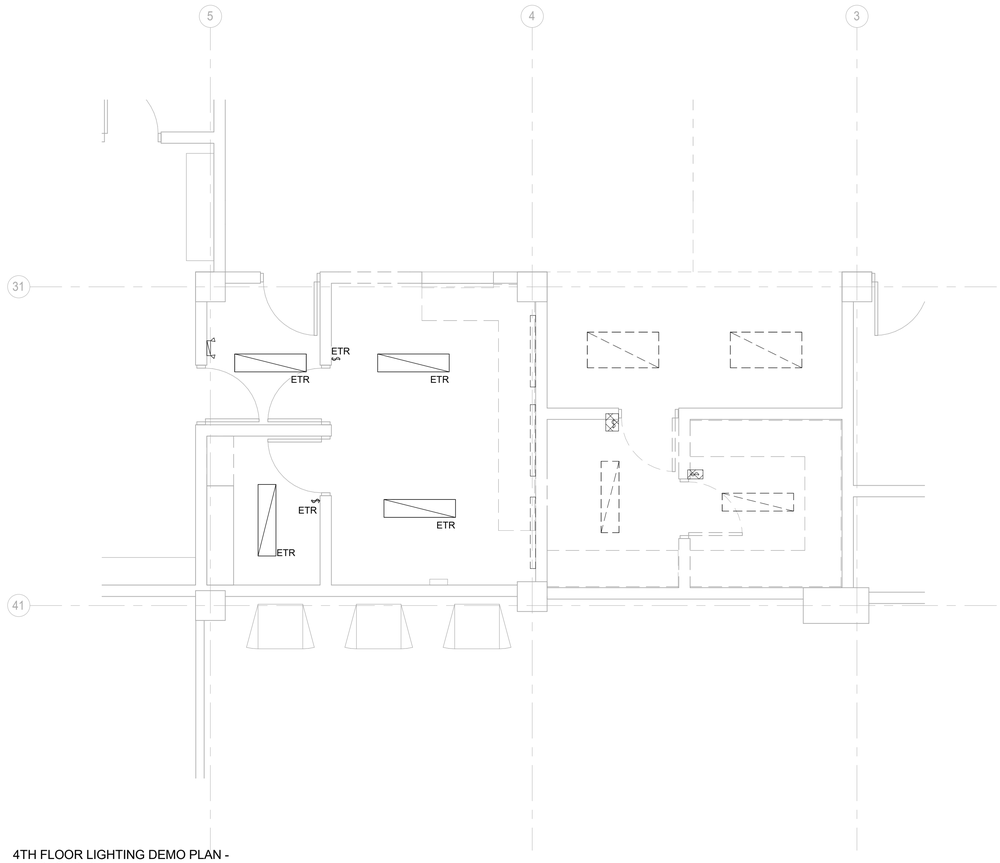
ELECTRICAL DEMOLITION NOTES:

A. IF SUSPICIOUS MATERIALS ARE ENCOUNTERED DURING COURSE OF PROJECT WORK, CONTRACTOR SHALL STOP WORK IMMEDIATLEY AND NOTIFY ARCHITECT, ENGINEER, AND OWNER.
B. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
C. ALL WORK SHALL BE SCHEDULED WITH OWNER, WITH MINIMUM OF TWO WEEK NOTICE PRIOR TO SYSTEM SHUT DOWNS.
D. ALL DEVICES SHOWN HATCHED OR DASHED ARE TO BE DEMOLISHED, UNLESS NOTED OTHERWISE.
E. DEMOLITION DRWAINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATIONS AND EXISTING ELECTRICAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER TO THOSE ITEMS, WHICH DO SHOW.
F. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH EXISTING ELECTRICAL SYSTEMS, WHICH WILL BE AFFECTED BY DEMOLITION/REMODELING WORK.
G. WIRING SHALL BE REMOVED, TERMINATED OR EXTENDED AS REQUIRED TO MAINTAIN CIRCUIT CONTINUITY AS CONDITIONS MAY DICTATE. ALL BRANCH CIRCUITS TO BE DISCONNECTED SHALL BE IDENTIFIED AS TO LOCATION OR ITME SERVED BEFORE DISCONNECTING. CIRCUITS SERVING AREAS BEYOND IMMEDIATE DEMOLITION/REMODELING SHALL BE MAINTAINED. IN DEMOLITION/REMODELING AREAS ANY FEEDERS, CONDUITS, BRANCH CIRCUITS, SIGNAL AND TELEPHONE CIRCUITS, ETC PASSING THROUGH THESE AREAS TO SERVE REMOTE OR SURROUNDING AREAS THAT ARE TO REMAIN, SHALL BE RETAINED ANDKEPT OPERATIONAL AND SHALL BE REROUTED IN CASES WHERE THEY INTERFER WITH ANY NEW WORK.

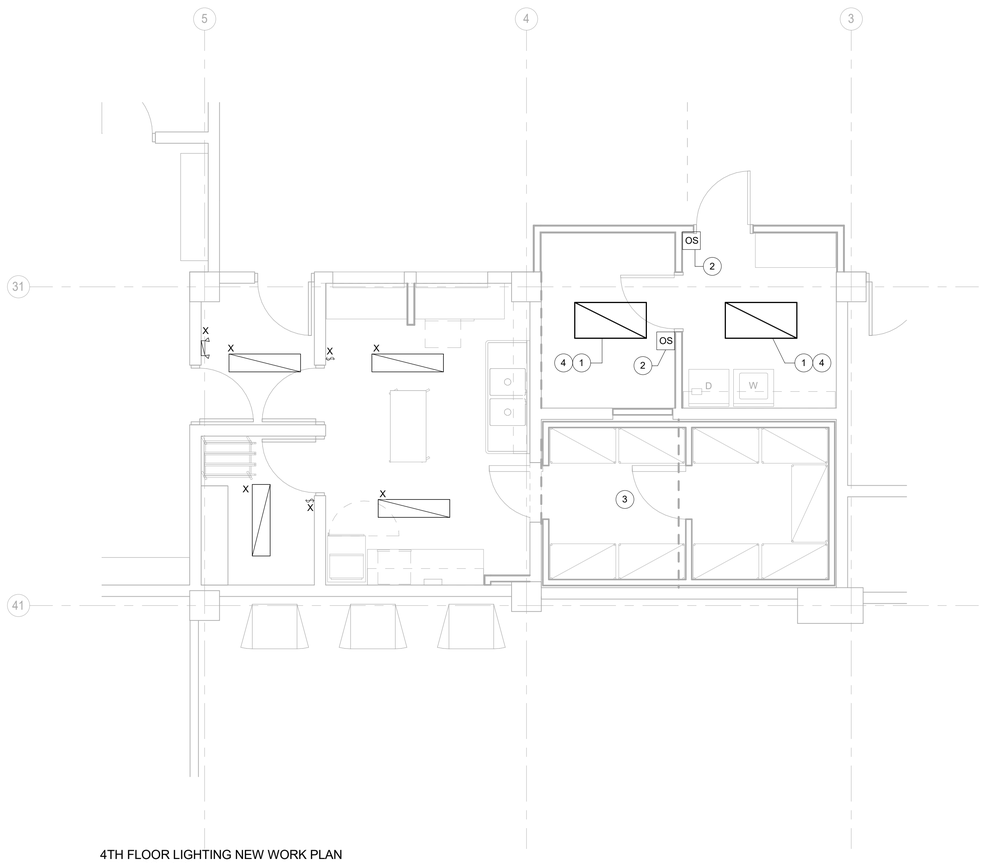
Keynote Legend	
Key Value	Keynote Text
1	PROVIDE NEW 2X4 RECESSED LED PRISMATIC TROFFER, LITHONIA CAT# 2GTL 40LM EZ1 LP835 N100 OR APPROVED EQUAL.
2	PROVIDE WALL MOUNTED DUAL TECHNOLOGY SENSOR FOR CONTROL OF ROOM LIGHTING. DEVICE SHALL BE LITHONIA ACUITY NLIGHT #NWSX PDT LV OR APPROVED EQUAL.
3	LIGHTING IN THE COOLERS IS PROVIDED WITH EQUIPMENT. E.C. SHALL LOCATED THE LIGHT SWITCH IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PROVIDE BRANCH CIRCUIT FROM PANEL PB32.
4	NEW LIGHTING SHALL BE CIRCUITED FROM EXISTING PANEL E4H. E.C. SHALL CONNECT TO EXISTING LIGHTING CIRCUIT SERVING AREA AND SHALL VERIFY THAT THE ADDED LIGHTING LOAD SHALL NOT EXCEED CIRCUIT CAPACITY.

GENERAL ELECTRICAL NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. ALL WORK SHALL BE PERFORMED IN A CLEAN WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
C. ALL WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, ALL LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
D. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ALL FEES AS REQUIRED.
E. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
F. CLEAN THE JOBSITE DAILY AND REMOVE ANY DIRT AND DEBRIS CAUSED BY WORK.
G. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES.



1 4TH FLOOR LIGHTING DEMO PLAN - ENLRAGED PLAN
1/4" = 1'-0"



2 4TH FLOOR LIGHTING NEW WORK PLAN - ENLARGED PLAN
1/4" = 1'-0"

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

PRELIMINARY

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTIO

ISSUED 10/30/18

PROJECT 2018.033.00

4TH FLOOR LIGHTING DEMO AND NEW WORK PLANS

E100

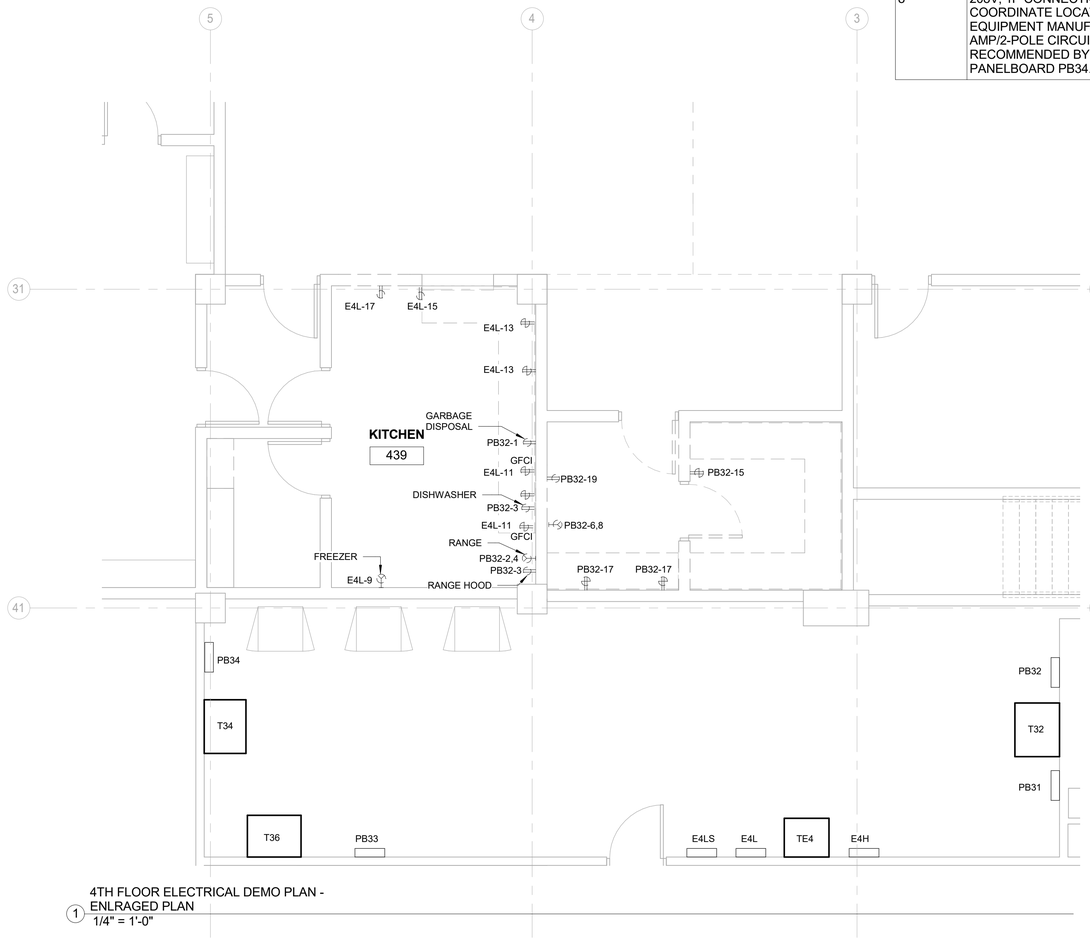
ELECTRICAL DEMOLITION NOTES:

A. IF SUSPICIOUS MATERIALS ARE ENCOUNTERED DURING COURSE OF PROJECT WORK, CONTRACTOR SHALL STOP WORK IMMEDIATLEY AND NOTIFY ARCHITECT, ENGINEER, AND OWNER.
B. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
C. ALL WORK SHALL BE SCHEDULED WITH OWNER, WITH MINIMUM OF TWO WEEK NOTICE PRIOR TO SYSTEM SHUT DOWNS.
D. ALL DEVICES SHOWN HATCHED OR DASHED ARE TO BE DEMOLISHED, UNLESS NOTED OTHERWISE.
E. DEMOLITION DRWAINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATIONS AND EXISTING ELECTRICAL DRAWINGS. ADDITIONAL COMPONENTS MAY EXIST WHICH DO NOT SHOW AND SUCH ITEMS SHALL BE DEALT WITH IN A MANNER TO THOSE ITEMS, WHICH DO SHOW.
F. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE HIMSELF WITH EXISTING ELECTRICAL SYSTEMS, WHICH WILL BE AFFECTED BY DEMOLITION/REMODELING WORK.
G. WIRING SHALL BE REMOVED, TERMINATED OR EXTENDED AS REQUIRED TO MAINTAIN CIRCUIT CONTINUITY AS CONDITIONS MAY DICTATE. ALL BRANCH CIRCUITS TO BE DISCONNECTED SHALL BE IDENTIFIED AS TO LOCATION OR ITME SERVED BEFORE DISCONNECTING. CIRCUITS SERVING AREAS BEYOND IMMEDIATE DEMOLITION/REMODELING SHALL BE MAINTAINED. IN DEMOLITION/REMODELING AREAS ANY FEEDERS, CONDUITS, BRANCH CIRCUITS, SIGNAL AND TELEPHONE CIRCUITS, ETC PASSING THROUGH THESE AREAS TO SERVE REMOTE OR SURROUNDING AREAS THAT ARE TO REMAIN, SHALL BE RETAINED ANDKEPT OPERATIONAL AND SHALL BE REROUTED IN CASES WHERE THEY INTERFER WITH ANY NEW WORK.

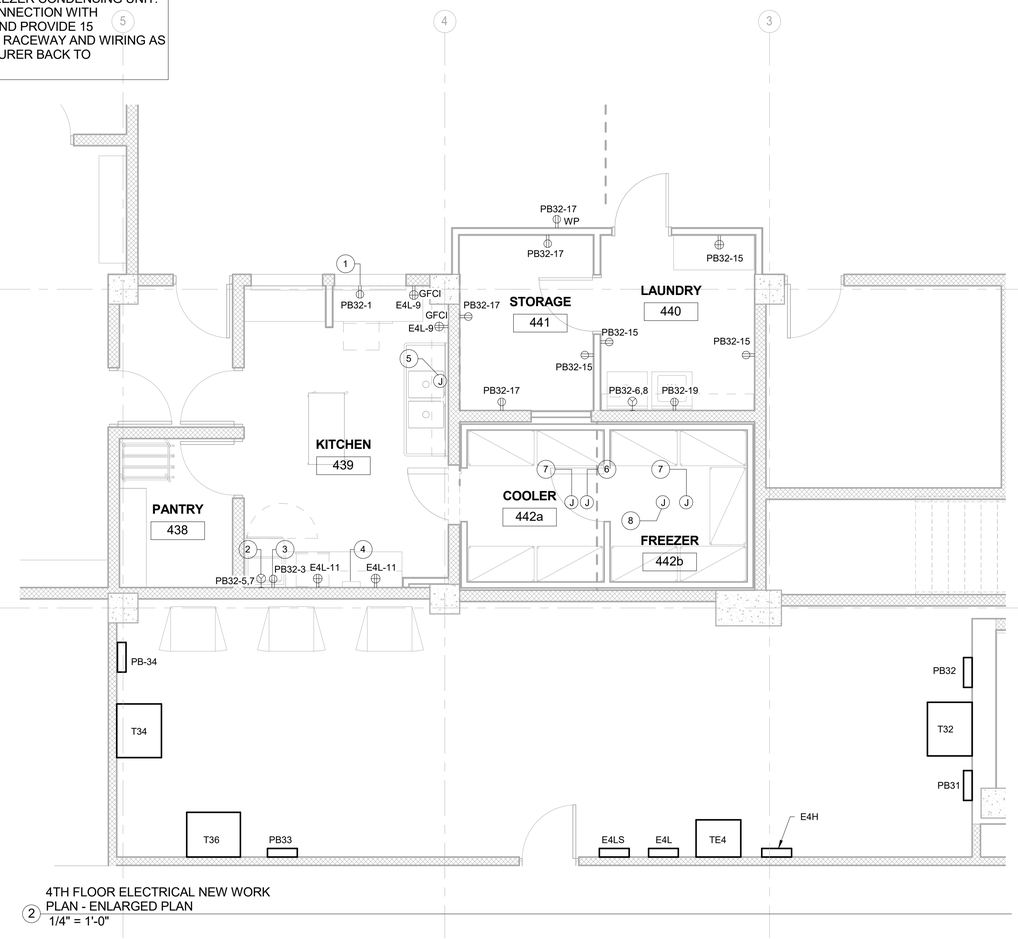
Keynote Legend	
Key Value	Keynote Text
1	NEW 120V UNDERCABINET DISHWASHER.
2	NEW 208V, 1P OVEN PROVIDED WITH 8' NEMA 6-30P CORD. REFER TO ARCHITECTURAL ELEVATIONS FOR OUTLET LOCATION. REUSE CIRCUIT INDICATED AND MAKE FIELD MODIFICATIONS AS REQUIRED TO CIRCUIT BREAKER AND WIRE SIZING AS REQUIRED TO ACCOMPLISH NEW WORK.
3	NEW 120V MICROWAVE MOUNTED ABOVE OVEN. REFER TO ARCHITETURAL ELEVATIONS FOR RECEPTACLE LOCATION.
4	LOCATION OF DISCONNECT SWITCH FOR DISHWASHER. REFER TO ARCHITECTURAL ELEVATIONS FOR MOUNTING HEIGHT.
5	NEW 208V, 3P 2HP FOOD DISPOSAL. PROVIDE NEW 20/3 CIRCUIT BREAKER, RACEWAY AND WIRING BACK TO PANELBOARD PB34.
6	208V, 1P CONNECTION FOR COOLER CONDENSING UNIT. COORDINATE LOCATION OF CONNECTION WITH EQUIPMENT MANUFACTURER AND PROVIDE 15 AMP/2-POLE CIRCUIT BREAKER, RACEWAY AND WIRING AS RECOMMENDED BY MANUFACTURER BACK TO PANELBOARD PB34.
7	120V CONNECTION FOR COOLER/FREEZER LIGHTS. COORDINATE LOCATION AND REQUIREMENTS WITH EQUIPMENT MANUFACTURER.
8	208V, 1P CONNECTION FOR FREEZER CONDENSING UNIT. COORDINATE LOCATION OF CONNECTION WITH EQUIPMENT MANUFACTURER AND PROVIDE 15 AMP/2-POLE CIRCUIT BREAKER, RACEWAY AND WIRING AS RECOMMENDED BY MANUFACTURER BACK TO PANELBOARD PB34.

GENERAL ELECTRICAL NOTES:

A. FOR CLARITY OF INFORMATION ON DRAWING, ALL EXISTING PIPING, DUCTWORK, CONDUIT, ETC. IS NOT SHOWN ON THIS DRAWING. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ACTUAL SITE CONDITIONS AND COORDINATING WORK WITH EXISTING UTILITIES IN SPACE.
B. ALL WORK SHALL BE PERFORMED IN A CLEAN WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION.
C. ALL WORK TO BE PERFORMED IN STRICT COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE, ALL LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
D. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ALL FEES AS REQUIRED.
E. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER.
F. CLEAN THE JOBSITE DAILY AND REMOVE ANY DIRT AND DEBRIS CAUSED BY WORK.
G. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES.



1 4TH FLOOR ELECTRICAL DEMO PLAN - ENLRAGED PLAN
1/4" = 1'-0"



2 4TH FLOOR ELECTRICAL NEW WORK PLAN - ENLARGED PLAN
1/4" = 1'-0"

RESOURCE CONSULTING ENGINEERS LLC

MEP ENGINEER:
RESOURCE CONSULTING ENGINEERS, LLC

3116 SOUTH DUFF
SUITE
AMES, IA
515-292-250
www.resourcece.com

PRELIMINARY

WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

WOODBURY COUNTY

822 Douglas Street
Sioux City, IA 51101

KEY

REVISION

MARK	DATE	DESCRIPTIO

ISSUED 10/30/18

PROJECT 2018.033.00

4TH FLOOR POWER DEMO AND NEW WORK PLANS

E200

GOLDBERG GROUP ARCHITECTS, PC

gga

Architecture • Feasibility Studies • Criminal Justice Planning • Interiors

805 N. 36th Street, Suite B, St. Joseph, MO, 64506, 816-233-9300, fax 816-233-9399

PROJECT MANUAL

WOODBURY COUNTY
WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS

SIOUX CITY, IOWA

GGA Project #: 16007-01
Date: February 1, 2019

GGA Contact: Kevin Rost, AIA
(P) 816.233.9300
(F) 816.233.9399

Owner: Woodbury County Iowa
Owner Contact: Kenny Schmitz
(P) 712.279.6539

SECTION 00 01 07
SEALS PAGE

END OF SECTION

SECTION 00 01 10

TABLE OF CONTENTS

END OF SECTION

SECTION 00 11 13
NOTICE OF HEARING AND LETTING

A hearing will be conducted on the proposed plans and specifications, the proposed form of contract and estimate of cost for the Woodbury County Juvenile Detention Center: Kitchen & Laundry Renovations, Sioux City, Iowa at a meeting of the Woodbury County Supervisors to be held at the Board Room, Woodbury County Courthouse, Sioux City, IA at 4:45 pm, on the 16th of February 2019, at which time and place any person may appear and file objections to the proposed plans, specifications and form of contract and estimated costs for the Project.

Sealed proposals will be accepted for a General Contract for the Kitchen & Laundry Renovations for the Woodbury County Juvenile Detention Center, Sioux City, Iowa in the Board Room. Proposals will be received on behalf of the County, until 3:00 P.M. on the 16th day of January 2018, and at such time and place will be opened and publicly read.

Proposals previously received will be acted upon by the Woodbury County Board of Supervisors at their meeting on January 23, 2018 at 4:30 pm or at such later time and place as may then be fixed.

Contract documents may be examined at the office of the Architect, Goldberg Group Architects, PC 805 N 36th Street Suite B, St. Joseph, MO 64506, or obtained from the Architect for a $100 refundable deposit. Contract documents may also be examined at the following building Exchanges.

McGraw-Hill construction Dodge, c/o Beeline & Blue, 2507 Ingersoll Ave, Des Moines,

IA 50312 Master Builders of Iowa, 221 Park Street, Des Moines, IA 50309

North Iowa Builders Exchange, 15 West State Street, Box 1154, Mason

City, IA 50401 Omaha Builders Exchange, 4255 S. 94th Street, Omaha

NE 68127

Plains Builders Exchange, 220 N. Kiwanis Avenue, Sioux

Falls SD 57104 Sioux City Construction League, 3900

Stadium Drive, Sioux City, IA 51106 Sioux Falls Builders

Exchange, 1418 “C” Avenue, Sioux Falls, SD 57104

Work under the proposed contract shall be commenced upon receipt of signed contract and shall be completed in a timely manner but in no event shall Substantial Completion be later than June 01, 2018, subject to any extension of time which may be granted by the Woodbury County Board of Supervisors.

The Woodbury County Board of Supervisors reserves the right to reject any and all proposals, re-advertise for new bids and to waive informalities that may be in the best interest of the County.

Each Proposal shall be accompanied by cash, a bid bond, certified check, cashier's check or certified credit union share draft in a **separate sealed envelope** in an amount equal to 5% of the total amount of the base bid or base bids. The certified check or cashier's check or certified share draft shall be drawn on a bank or credit union in Iowa or a bank or credit union chartered under the laws of the United States of America and shall be made payable to Woodbury County as security that if awarded a contract by resolution of the Woodbury County Board of Supervisors, the bidder will enter into a contract at the prices bid and furnish the required performance bond, the certified check, cashier's check, or certified share draft may be cashed, or the bid bond forfeited, and the proceeds retained as penalty if the bidder fails to execute a contract of file acceptable performance and payment bonds or provide an acceptable certificate of insurance within 10 days after the acceptance of such proposal by resolution of the Woodbury County Board of Supervisors.

By virtue of statutory authority, a preference will be given to products and provisions grown and locally produced with the State of Iowa and to Iowa domestic labor.

No bidder may withdraw a bid for at least 30 days after the scheduled closing time for receiving bids.

The successful bidder will be notified on or after January 23, 2018, after the proposals have been reviewed by the Architect and recommendation as to the lowest responsible bidder has been made to the County and accepted by the County Board of Supervisors.

The successful bidder of the General Contract will be required to furnish a Performance Bond, separate Labor & Material Payment Bond, and Insurance; said documents to be issued by a responsible surety approved by Woodbury County and shall guarantee the faithful performance of the contract and the terms and conditions therein contained.

Plans and specifications governing the construction of said proposed improvements have been prepared by Goldberg Group Architects, PC, St. Joseph, MO which plans and specifications referring to and defining said proposed improvements are hereby made a part of this notice and the proposed contract shall be executed to comply therein.

Notice is published upon order of Woodbury County of Sioux City, Iowa.

DOCUMENT 00 22 13
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

1.1 INSTRUCTIONS TO BIDDERS

A. Instructions to Bidders for Project consist of the following:

1. AIA Document A701, "Instructions to Bidders," a copy of which is bound in this Project Manual.
2. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

A. The following supplements modify AIA Document A701, "Instructions to Bidders." Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions to Bidders, unaltered portions of the Instructions to Bidders shall remain in effect.

1.3 ARTICLE 2 - BIDDER'S REPRESENTATIONS

A. Add Section 2.1.3.1:

1. 2.1.3.1 - The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.

B. Add Section 2.1.5:

1. 2.1.5 - The Bidder is a properly licensed Contractor according to the laws and regulations of State of Iowa and meets qualifications indicated in the Procurement and Contracting Documents.

C. Add Section 2.1.6:

1. 2.1.6 - The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

1.4 ARTICLE 3 - BIDDING DOCUMENTS

A. 3.4 - Addenda:

1. Delete Section 3.4.3 and replace with the following:

a. 3.4.3 - Addenda may be issued at any time prior to the receipt of bids.

2. Add Section 3.4.4.1:

a. 3.4.4.1 - Owner may elect to waive the requirement for acknowledging receipt of 3.4.4 Addenda as follows:

1) 3.4.4.1.1 - Information received as part of the Bid indicates that the Bid, as submitted, reflects modifications to the Procurement and Contracting Documents included in an unacknowledged Addendum.
2) 3.4.4.1.2 - Modifications to the Procurement and Contracting Documents in an unacknowledged Addendum do not, in the opinion of Owner, affect the Contract Sum or Contract Time.

1.5 ARTICLE 4 - BIDDING PROCEDURES

A. 4.1 - Preparation of Bids:

1. Add Section 4.1.1.1:

a. 4.1.1.1 - Printable electronic Bid Forms and related documents are available from Architect.

2. Add Section 4.1.8:

a. 4.1.8 - The Bid shall include unit prices when called for by the Procurement and Contracting Documents. Owner may elect to consider unit prices in the determination of award. Unit prices will be incorporated into the Contract.

3. Add Section 4.1.9:

a. 4.1.9 - Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.

B. 4.2 – Bid Security

1. Add Section 4.2.4
a. Bid Security shall be in the form of cash, cashier's check, a certified check, a Credit Union certified share draft or a Bid Bond in an amount of at least five (5%) of the Base Bid. Checks shall be made payable to Woodbury County, Sioux City, Iowa. Bid Bonds must be executed by corporations authorized to contract as surety in Iowa and in addition to all other provisions, clearly designated an Iowa resident agent as attorney-in-fact.
b. Bid Security shall be placed in a <u>separate</u> sealed envelope from the envelope containing the Bid Form.

C. 4.4 - Modification or Withdrawal of Bids:

1. Add the following sections to 4.4.2:

a. 4.4.2.1 - Such modifications to or withdrawal of a bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney,

signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.

b. 4.4.2.2 - Owner will consider modifications to a bid written on the sealed bid envelope by authorized persons when such modifications comply with the following: the modification is indicated by a percent or stated amount to be added to or deducted from the Bid; the amount of the Bid itself is not made known by the modification; a signature of the authorized person, along with the time and date of the modification, accompanies the modification. Completion of an unsealed bid form, awaiting final figures from the Bidder, does not require power of attorney due to the evidenced authorization of the Bidder implied by the circumstance of the completion and delivery of the Bid.

1.6 ARTICLE 5 - CONSIDERATION OF BIDS

A. 5.2 - Rejection of Bids:

1. Add Section 5.2.1:

a. 5.2.1 - Owner reserves the right to reject a bid based on Owner's and Architect's evaluation of qualification information submitted following opening of bids. Owner's evaluation of the Bidder's qualifications will include: status of licensure and record of compliance with licensing requirements, record of quality of completed work, record of Project completion and ability to complete, record of financial management including financial resources available to complete Project and record of timely payment of obligations, record of Project site management including compliance with requirements of authorities having jurisdiction, record of and number of current claims and disputes and the status of their resolution, and qualifications of the Bidder's proposed Project staff and proposed subcontractors.

1.7 ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

A. 7.1 - Bond Requirements:

1. Add Section 7.1.1.1:

a. 7.1.1.1 - Both a Performance Bond and a Payment Bond will be required, each in an amount equal to 100 percent of the Contract Sum.

B. 7.2 - Time of Delivery and Form of Bonds:

1. Delete the first sentence of Section 7.2.1 and insert the following:

a. The Bidder shall deliver the required bonds to Owner no later than 10 days after the date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default.

2. Delete Section 7.2.3 and insert the following:

a. 7.2.3 - Bonds shall be executed and be in force on the date of the execution of the Contract.

1.8 ARTICLE 9 - EXECUTION OF THE CONTRACT

A. Add Article 9:

1. 9.1.1 - Subsequent to the Notice of Intent to Award, and within 10 days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Architect, in such number of counterparts as Owner may require.
2. 9.1.2 - Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.
3. 9.1.3 - Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
4. 9.1.4 - In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re- advertise for bids.

1.9 ARTICLE 10 – BIDDING COORDINATORS

A. General Construction: Kevin Rost, Goldberg Group Architects, 805 N. 36th Street Suite B, St. Joseph, MO 64506; Phone: (816) 233-9300; Fax: (816) 233-9399, Email: kevin.r@gga-pc.com.

1.10 ARTICLE 11 – ISSUANCE OF DRAWINGS AND SPECIFICATIONS

A. Contract Documents are at the following Building Exchanges:
Greater Fort Dodge Growth Alliance, 24 N 9th St., Ste. A, Fort Dodge, IA 50501
Master Builders of Iowa, 221 Park Street, Des Moines, IA 50309
McGraw-Hill Construction Dodge, c/o Beeline Blue, 2507 Ingersoll Ave., Des Moines, IA 50312
North Iowa Builders Exchange, 15 West State Street, Box 1154, Mason City, IA 50401
Omaha Builders Exchange, 4255 S. 94th St. Omaha, NE 68127
Plains Builders Exchange, 220 N. Kiwanis Ave., Sioux Falls, SD 57104
Sioux City Construction League, 3900 Stadium Drive, Sioux City, IA 51106
Sioux City Blueprint, 709 Douglas St., Sioux City, IA 51101
Sioux Falls Builders Exchange, 1418 “C” Avenue, Sioux Falls, SD 57104

Contract Documents may be obtained from the Architect with a $100.00 refundable deposit required. Deposits will be refunded upon return of documents in good condition not more than ten (10) days after bids have been awarded.

Individual drawing sheets may be obtained for $3.00 each and specification pages for $0.15 each, non-refundable.

1.11 ARTICLE 12 – PRE-BID CONFERENCE

A. A Pre-Bid Conference for interested General Contractors and Major Subcontractors will be held in the 4th floor lobby of the Juvenile Detention Center, 822 Douglas Street #401, Sioux City, IA 51101 on December 28th, 2017 at 1:00 P.M. local time.

1.12 ARTICLE 13 – SITE EXAMINATION

A. Examination of the existing building will occur at the Pre-Bid Conference. Individual tours will not be provided.

Each Bidder, by submitting a bid, represents that he has visited the site to become acquainted with the scope of work; conditions of the site; facilities for delivery, storing, placing and handling of materials and equipment; other work being performed; other work in place; and other obstacles, conditions, or relevant matters concerning the work to be performed.

The successful Bidder will not be allowed extra compensation for any matter or thing which the Bidder may have informed themselves of prior to submitting a Bid.

END OF DOCUMENT 00 22 13

00 41 10
BID FORM - STIPULATED SUM

1.1 BID INFORMATION

A. Bidder:_____.

B. Project Name: **WOODBURY COUNTY JUVENILE DETENTION CENTER: KITCHEN & LAUNDRY RENOVATIONS**

C. Project Location**: 822 Douglas Street, Sioux City, Iowa**

D. Owner: Woodbury County

E. Architect: Goldberg Group Architects, P.C.

F. Architect Project Number: 16007-01

1.2 CERTIFICATIONS AND BASE BID

A. **CONTRACT NO. 1:** Special Construction Base Bid, Prime Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Goldberg Group Architects, PC and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. Provide a cost for the Replacement of the Security Electronics Systems as defined in specification section 01 10 00, 1.4, A, 1.

   _____Dollars

   ($_____).

2. Provide a cost for Alternate Bid #1 as defined in specification section 01 10 00, 1.4, A, 1.

   _____Dollars

   ($_____).

B. **CONTRACT NO. 2:** Special Construction Base Bid, Prime Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Goldberg Group Architects, PC and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. Provide a cost for the Elevator Replacement and Improvements as defined in specification section 01 10 00, 1.4, A, 2.

   _____Dollars

   ($_____).

2. Provide a cost additional 5 year parts and service contract as defined in specification section 01 10 00, 1.4, A, 2

   _____Dollars

   ($_____).

C. **CONTRACT NO. 3:** Special Construction Base Bid, Prime Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by Goldberg Group Architects, PC and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

1. Provide a cost for the Mechanical, Electrical and Fire Alarm scopes of work as defined in specification section 01 10 00, 1.4, A, 3.

   _____Dollars

   ($_____).

1.3 BID GUARANTEE

A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within ten (10) days after a written Notice of Award, if offered within sixty (60) days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the amount constituting five percent (5%) of the Base Bid amount above:

B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

1.4 TIME OF COMPLETION

A. The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by the Architect, and shall fully complete the Work no later than June 1, 2018.

B. Work on the project must completely stop from May 1 thru May 6, 2018. This is the week of the Courthouse Anniversary Celebration.

1.5 ACKNOWLEDGEMENT OF ADDENDA

A. The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

1. Addendum No.__ , dated_____.
2. Addendum No.__ , dated_____.
3. Addendum No.__ , dated_____.

1.6 CONTRACTOR'S LICENSE

A. The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in Sioux City, Iowa, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

1.7 SUBMISSION OF BID

A. Respectfully submitted this_____day of_____, 2018.

B. Submitted By:_____(Name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

F. Street Address:_____.

G. City, State, Zip:_____.

H. Phone:_____.

END OF BID FORM

SECTION 00 60 00

PROJECT FORMS

FORM OF AGREEMENT AND GENERAL CONDITIONS

1.01 THE FOLLOWING FORM OF OWNER/CONTRACTOR AGREEMENT AND FORM OF THE GENERAL CONDITIONS SHALL BE USED FOR PROJECT:

A. AIA Document A101-2017, "Standard Form of Agreement between Owner and Contractor."
   1. The General Conditions for Project are AIA Document A201-1997, "General Conditions of the Contract for Construction."

B. The General Conditions are included in the Project Manual.

C. The Supplementary Conditions for Project are separately prepared and included in the Project Manual.

ADMINISTRATIVE FORMS

2.01 ADMINISTRATIVE FORMS: ADDITIONAL ADMINISTRATIVE FORMS ARE SPECIFIED IN DIVISION 01 GENERAL REQUIREMENTS.

2.02 COPIES OF AIA STANDARD FORMS MAY BE OBTAINED FROM THE AMERICAN INSTITUTE OF ARCHITECTS; HTTP://WWW.AIA.ORG/CONTRACTDOCS/PURCHASE/INDEX.HTM; <HTTP://WWW.AIA.ORG/CONTRACTDOCS/PURCHASE/INDEX.HTM%3B>DOCSPURCHASES @AIA.ORG; (800) 942-7732.

2.03 INFORMATION AND MODIFICATION FORMS:

A. Form for Requests for Information (RFIs): AIA Document G716, "Request for Information (RFI)."

B. Form of Request for Proposal: AIA Document G709, "Work Changes Proposal Request."

C. Change Order Form: AIA Document G701, "Change Order."

D. Form of Architect's Memorandum for Minor Changes in the Work: AIA Document G707, "Architect's Supplemental Instructions."

E. Form of Change Directive: AIA Document G714, "Construction Change Directive."

2.04 PAYMENT FORMS:

A. Schedule of Values Form: AIA Document G703, "Continuation Sheet."

B. Payment Application: AIA Document G702/703, "Application and Certificate for Payment and Continuation Sheet."

C. Form of Contractor's Affidavit: AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."

D. Form of Affidavit of Release of Liens: AIA Document G706A, "Contractor's Affidavit of Payment of Release of Liens."

E. Form of Consent of Surety: AIA Document G707, "Consent of Surety to Final Payment."

END OF SECTION

WOODBURY COUNTY CAPITAL IMPROVEMENT PROJECTS

BACKGROUND CHECK

Courthouse-Room B07
620 Douglas Street
Sioux City, Iowa 51101
Telephone (712)279-6539 Fax (712)279-6532

October, 2016

To whom it may concern,

I_____Authorize the Woodbury County (Sheriff's office) to conduct a personal background check. This background check will be conducted in accordance to requirements specified in the Woodbury County Courtroom Window Renovation Project.

Please sign, and place a copy of the front of your Driver's License (must have current address) and a copy of your Social Security card side-by-side at the bottom of this form and return to Baker Group.

WOODBURY COUNTY CAPITAL IMPROVEMENT PROJECTS

QUALITY ASSURANCE QUESTIONNAIRE

Woodbury County is requesting that the following questionnaire be completed by all prospective General Contractors and must be included, prior to or at the time of bid submission. Pursuant to Iowa Code 26.9, contracts for public improvements must be awarded to the "lowest responsive, responsible bidder". Factors other than price may be considered when making the award. This questionnaire is only applicable to public improvements which exceed the competitive bid amount set pursuant to Iowa Code 26.3, 26.14 and 314.1B, currently $135,000.00.

Company/Contracting Firm: _____

Owner/ Representative: _____

Address: _____

Main Telephone: _____ E-Mail: _____

1. Within the past Five (5) years, has the Contractor been disbarred by any Federal, State, or Local government entity from bidding projects? ____ Yes ____No

   If yes, please explain on separate attachment.

2. Within the past Five (5) years, has the Contractor- defaulted on a contract, been disqualified, removed or otherwise prevented from bidding on, or completing a Government, State, or Local project? ____ Yes ____ No

   If yes, please explain on separate attachment.

3. Within the past five (5) years has the Contractor been found by a court or agency of competent jurisdiction, to be delinquent (delinquent shall include but not limited to failure to file, failure to pay, or imposition tax liens) in meeting its obligation under Federal, State, or Local tax laws? ____ Yes ____ No

   If yes, please explain on separate attachment.

4. Within the past Five (5) years has the Contractor been unable to obtain, or been denied a bond? ____ Yes ____ No

   If yes, please explain on separate attachment.

5. Within the past Five (5) years has the Contractor declared bankruptcy or been under receivership? ____ Yes ____ No

   If yes, please explain on separate attachment.

6. Within the past Five (5) years has the Contractor filed any lawsuits, or sought arbitration with regard to any construction project? ____ Yes ____ No

   If yes, please explain on separate attachment.

7. Are any lawsuits, legal proceedings, arbitration, or judgment's pending/ outstanding against the Contractor, its owner, or officers? ____ Yes ____ No

   If yes, please explain on separate attachment.

8. Within the past Five (5) years has the Contractor been found to have violated any of the following Federal or State Laws:
   Iowa Child Labor Act, Iowa Labor Commissioner's Right to Inspect Premises, Iowa Compensation Insurance Act, Iowa Competition Act, Iowa Employee Registration Requirements, Iowa Hazardous Chemicals Risks Act, Iowa Income Corporate and Sales Tax Code, Iowa Minimum Wage Act, Iowa Non-speaking English Employee Act, Iowa Wage Payment Collection Act, a "willful" violation of the Iowa or Federal Occupational Safety and Health Act, Federal Income or Corporate Tax Code, The National Insurance Act, OR the Fair Labor Standards Act? ____ Yes ____ No

   If yes, please explain on separate attachment.

9. Has the Contractor ever failed to complete any work awarded to it? ____ Yes ____ No

   If yes, please explain on separate attachment.

10. On a separate sheet provide the following:
    a. Three (3) references the company completed projects with in the past Three (3) years. Include entities; contact name, address, and current telephone number.
    b. List all Surety/ Bonding Companies utilized by the company in the past Three (3) years.

11. Contractor affirms that it will retain only subcontractors who will fully comply with the bid specifications, including those that address requirements concerning all labor laws? ____ Yes ____ No

_____ _____

Signature Date

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

A. The following supplements modify, change, delete from or add to the "General Conditions of the Contract of Construction", AIA Document A201-2017 Edition, electronic format. Where any article of the General Conditions is modified or any paragraph, sub-paragraph, or clause thereof is modified or deleted by these supplements, the unaltered provisions of that article, paragraph, sub-paragraph, or clause shall remain in effect. Supplements are as follows:

1.02 MODIFICATIONS TO GENERAL CONDITIONS

A. Article 9 - Payments and Completion
   1. Strike the phrase “or awarded by binding dispute resolution”

B. Article 10 - Protection of Persons and Property
   1. 10.3.3 Strike section
   2. 10.3.6 Strike section

C. Article 11 - Insurance and Bonds
   1. In the first sentence, change “Owner” to “Contractor”
   2. 11.3.1 Replace text with: “Unless otherwise provided, the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a build’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section
      a. 9.10 or until no person or entity other than the Contractor has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, The Subcontractors, and Sub- subcontractors in the Project.”
   3. 11.3.1.2 Strike section
   4. 11.3.1.3 Replace text with: "If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles."
   5. 11.3.2 Replace text with: “If applicable in the Contract Documents, the Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractor, and Sub-subcontractor in the Work and the Owner and Contractor shall be named insureds.”
   6. 11.3.3 Strike last sentence that reads: “The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.”
   7. 11.3.5 Strike section
   8. 11.3.7 Strike section
   9. 11.3.8 In the first sentence, strike the work “Owner’s”.
   10. 11.3.9 Strike section
   11. 11.3.10 Strike last sentence that reads: “If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.”

D. Article 13 - Miscellaneous Provisions

1. Replace text with “The Contract shall be governed by the laws of the State of Iowa”.
    a. Strike text: “except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.”

E. Article 14 - Termination or Suspension of the Contract
1. 14.1.3 Strike the phrase “and damages”.

F. Article 15 - Claims and Disputes
1. 15.1.6 Strike section
2. 15.2.1 Strike text: “as a condition precedent to mediation”
3. 15.2.6 Strike section
4. 15.2.6.1 Strike section
5. 15.3 through 15.4.4.3 Strike sections

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF DOCUMENT

SECTION 01 10 00
SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.
7. Miscellaneous provisions.

1.3 PROJECT INFORMATION

A. Project Identification: Woodbury County Juvenile Detention Center: Kitchen & Laundry Renovations
   1. Project Location: 822 Douglas Street, Sioux City, Iowa 51101

B. Architect: Goldberg Group Architects, PC 805 N 36th Street, St. Joseph, MO 64506; 816-233-9300

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Renovations to the Kitchen and Laundry facilities at Woodbury County's Juvenile Detention Center.

B. Type of Contract:
   1. Project will be constructed under single prime contract.

1.5 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.

1.6 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

      a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. Work on the project must completely stop from May 1 thru May 6, 2018. This is the week of the Courthouse Anniversary Celebration.

C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

D. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard.

1.10 MISCELLANEOUS PROVISIONS

A. Contractor's One-Year Correction Period: For a period of one (1) year commencing upon the date of Substantial Completion of the work, Prime General Contractor shall repair or replace defective work and/or material to conform to the provisions of the Contract Documents without expense to the Owner, and within ten (10) working days after notification in writing by the Owner of such defective work or material.
1. If Prime Contractor shall not have made such repairs or replacements or have made arrangements for the correction thereof within the period specified above, the Owner shall do so and shall charge the cost to the Prime General Contractor.
2. See individual Specification Sections of the Project Manual regarding warranty-guarantee periods for various items of a longer period of time.

1.11 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.

Section 00 11 13 - Notice of Hearing and Letting
Section 00 21 13 - Instructions to Bidders (AIA A701)
Section 00 22 13 - Supplementary Instructions to Bidders
Section 00 41 00 - Bid Form
Section 00 50 00 - Standard Form of Agreement between Owner and Contractor (AIA A101)
Section 00 60 00 - Project Forms
Section 00 72 00 - General Conditions (AIA 201)
Section 00 73 00 - Supplementary Conditions
Section 01 10 00 - Summary
Section 01 20 00 - Price and Payment Procedures
Section 01 30 00 - Administrative Requirements
Section 01 40 00 - Quality Requirements
Section 01 50 00 - Temporary Facilities and Controls

Section 01 60 00 - Product Requirements
Section 01 70 00 - Execution and Closeout Requirements
Section 01 78 00 - Closeout Submittals
Section 02 41 00 - Demolition
Section 06 10 00 - Rough Carpentry
Section 07 92 00 - Joint Sealants
Section 08 33 13 - Coiling Counter Doors
Section 09 21 16 - Gypsum Board Assemblies
Section 09 51 00 - Acoustical Ceilings
Section 09 65 00 - Resilient Flooring
Section 09 90 00 - Painting and Coating
Section 11 40 00 - Foodservice Equipment
Section 22 05 23 - General-Duty Valves for Plumbing Piping
Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment
Section 22 07 19 - Plumbing Piping Insulation
Section 22 11 16 - Domestic Water Piping
Section 22 11 19 - Domestic Water Piping Specialties
Section 22 13 16 - Sanitary Waste and Vent Piping
Section 22 13 19 - Sanitary Waste and Vent Piping Specialties
Section 22 42 16.16 - Commercial Sinks
Section 23 01 00 - Basic HVAC Requirements
Section 23 02 00 - Selective HVAC Demolition
Section 23 31 13 - Metal Ducts
Section 23 33 46 - Flexible Ducts
Section 23 37 13.13 - Air Diffusers
Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
Section 26 05 26 - Grounding and Bonding for Electrical Systems
Section 26 05 29 - Hangers and Supports for Electrical Systems
Section 26 05 33 - Raceway and Boxes for Electrical Systems
Section 26 05 53 - Identification for Electrical Systems
Section 26 27 26 - Wiring Devices
Section 26 28 16 - Enclosed Switches and Circuit Breakers
Section 26 51 19 - LED Interior Lighting

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

1.02 RELATED REQUIREMENTS

A. Document 00 72 00 - General Conditions and Document 00 73 00 - Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.

B. Document 00 73 00 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.

1.03 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

B. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

E. Execute certification by signature of authorized officer.

F. Submit three copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 working days.

D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for

the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

F. Substantiation of Costs: Provide full information required for evaluation.
   1. Support each claim for additional costs with additional information:
   2. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.

B. Site mobilization meeting.

C. Progress meetings.

D. Construction progress schedule.

E. Coordination drawings.

F. Submittals for review, information, and project closeout.

G. Number of copies of submittals.

H. Submittal procedures.

1.02 PROJECT COORDINATION

A. Project Coordinator: General Contractor.

B. During construction, coordinate use of site and facilities through the Project Coordinator.

C. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

D. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.

E. Coordinate field engineering and layout work under instructions of the Project Coordinator.

F. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for interpretation.
   2. Shop drawings, product data, and samples.
   3. Test and inspection reports.
   4. Design data.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.
   9. Correction Punch List and Final Correction Punch List for Substantial Completion.
   10. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract and Architect.

6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. 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.

3.02 SITE MOBILIZATION MEETING

A. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Contractor's Superintendent.
5. Major Subcontractors.

C. Agenda:
1. Use of premises by Owner and Contractor.
2. Owner's requirements and occupancy prior to completion.
3. Temporary utilities provided by Owner.
4. Security and housekeeping procedures.
5. Schedules.
6. Application for payment procedures.
7. Procedures for maintaining record documents.

D. 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.

3.03 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Contractor's Superintendent.
5. Major Subcontractors.

C. Agenda:
1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Maintenance of progress schedule.
7. Corrective measures to regain projected schedules.
8. Planned progress during succeeding work period.
9. Maintenance of quality and work standards.
10. Effect of proposed changes on progress schedule and coordination.
11. Other business relating to Work.

D. 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.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

3.05 COORDINATION DRAWINGS

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect.

B. Documents for Information: Submit two copies.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

A. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
   2. Generic, non-project specific information submitted as shop drawings do not meet the requirements for shop drawings.

B. Transmit each submittal with a copy of approved submittal form.

C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

I. Provide space for Contractor and Architect review stamps.

J. When revised for resubmission, identify all changes made since previous submission.

K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Control of installation.

F. Tolerances.

G. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.

B. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2017.

1.04 SUBMITTALS

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

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.06 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Controls: Barriers and enclosures.

B. Security requirements.

C. Waste removal facilities and services.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

1.03 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.04 INTERIOR ENCLOSURES

A. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.05 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

1.06 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Document 00 21 13 - Instructions to Bidders: Product options and substitution procedures prior to bid date.

B. Section 01 40 00 - Quality Requirements: Product quality monitoring.

1.03 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor and shall be removed from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Cutting and patching.

D. Cleaning and protection.

E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 PROJECT CONDITIONS

A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

1.04 COORDINATION

A. See Section 01 10 00 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to HVAC, Plumbing, and Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.

2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. 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.
    a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
    b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. 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; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.09 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces,

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 00 72 00 - General Conditions and 00 73 00 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.

B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.

D. Individual Product Sections: Specific requirements for operation and maintenance data.

E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
   4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   2. Field changes of dimension and detail.
   3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Additional information as specified in individual product specification sections.

D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Include color coded wiring diagrams as installed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Include test and balancing reports.

O. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Submit Operation and Maintenance Manuals to General Contractor on a MicroSoft Windows compatible Flash Drive in " Tabbed" *pdf format, divided into sections as indicated below.

C. Where systems involve more than one specification section, provide separate tabbed divider for each system.

D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

G. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

H. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

I. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

J. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

K. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Include photocopies of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 50 00 - Temporary Facilities and Controls: Security, protective barriers, and waste removal.

C. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

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

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 3 EXECUTION

2.01 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. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Do not close or obstruct roadways or sidewalks without permit.
   6. 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.
   7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. 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 ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

2.02 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   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. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 .

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

D. Services (Including but not limited to Electrical and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; 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.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

2.03 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 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preservative treated wood materials.

B. 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 A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

C. AWPA U1 - Use Category System: User Specification for Treated Wood; 2017.

D. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. PS 20 - American Softwood Lumber Standard; 2015.

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 any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. 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: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.04 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.

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.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.02 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. 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.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.02 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com
   2. Dow Chemical Company: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
   3. Pecora Corporation: www.pecora.com.
   4. Sika Corporation: www.usa-sika.com.
   5. W.R. Meadows, Inc: www.wrmeadows.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Other joints indicated below.
   2. Do not seal the following types of joints.
      a. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
      b. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      c. Joints where installation of sealant is specified in another section.
      d. Joints between suspended panel ceilings/grid and walls.

B. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; Color to be selected by Architect from Manufacturer's full color chart and samples.

C. Interior Wet Areas: kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, countertops, and other similar items.

2.03 NONSAG JOINT SEALANTS

A. 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: To be selected by Architect from manufacturer's full range.
   2. Manufacturers:
      a. Pecora Corporation; 898NST Sanitary Silicone Sealant - Class 50: www.pecora.com.
      b. Sika Corporation; Sikasil GP: www.usa-sika.com.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's full range.
   4. Manufacturers:
      a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: www.pecora.com.
      b. Pecora Corporation; DynaTrol II General Purpose Two Part Polyurethane Sealant: www.pecora.com/.
      c. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com.
      d. Sherwin-Williams Company; Stampede 2NS Polyurethane Sealant: www.sherwin-williams.com.
      e. Sika Corporation; Sikaflex-1a: www.usa-sika.com.
      f. Sika Corporation; Sikaflex-15 LM: www.usa-sika.com.
      g. Sika Corporation; Sikaflex-2c NS: www.usa-sika.com.
      h. W. R. Meadows, Inc; POURTHANE NS: www.wrmeadows.com.
      i. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 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, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

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.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance 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.

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. 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.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 09 90 00 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (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; 2011.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

E. 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; 2014.

F. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

H. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

I. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

1.04 SUBMITTALS

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

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings. Indicate coordination of glazing frames and stops with glass and glazing requirements.

D. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:

1. Assa Abloy Ceco or Curries: www.assaabloydss.com.
2. Republic Doors: www.republicdoor.com.
3. Steelcraft, an Allegion brand: www.allegion.com/us.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Edge Profile: Hinged edge square, and lock edge beveled.
   4. Typical Door Face Sheets: Smooth, flush.
   5. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
      a. Prepare doors and frames to receive mortised and concealed finish hardware in accordance with Finish Hardware Schedule and templates provided by hardware supplier.
   6. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
   7. Finish: Factory primed, for field finishing

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 14 gage, 0.067 inch, minimum.
   2. Core Material: Vertical steel stiffeners.
   3. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. General:
   1. Finish: Factory primed, for field finishing.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

2.05 FINISHES

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

2.06 ACCESSORIES

A. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
   1. Refer to Section 08 71 00 Hardware Schedule for locations.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.07 FINISHES

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

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

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 doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Coordinate frame anchor placement with wall construction.
   1. In metal stud partitions, locate 4 frame anchors typical per jamb.

C. Fill frames in metal stud partitions tightly with unbacked strips of fiberglass batt insulation.

D. Coordinate installation of hardware.

E. Touch up damaged factory finishes.

3.03 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.

B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE

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

B. Refer to Hardware Schedule in Section 08 71 00

END OF SECTION

SECTION 08 33 13
COILING COUNTER DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated coiling counter doors and operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 SUBMITTALS

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

B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.

C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Coiling Counter Doors:
   1. Alpine Overhead Doors, Inc: www.alpinedoors.com/#sle.
   2. C.H.I. Overhead Doors; Model 6566 (stainless): www.chiohd.com/#sle.
   3. Overhead Door Corporation Model 657: www.overheaddoor.com.

2.02 COILING COUNTER DOORS

A. Coiling Counter Doors, Non-Fire-Rated: Stainless steel slat curtain.
   1. Mounting: Interior face mounted.
   2. Nominal Slat Size: 1-1/4 inches wide.
   3. Slat Profile: Flat.
   4. Finish, Stainless Steel: No. 4 - Brushed.
   5. Guides: Formed track; same material and finish unless otherwise indicated.
   6. Hood Enclosure: Manufacturer's standard; primed steel.
   7. Manual push up operation.
   8. Locking Devices: Slide bolt on inside.

2.03 MATERIALS

A. Curtain Construction: Interlocking, single thickness slats.
   1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
   2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
   3. Stainless Steel Slats: ASTM A666, Type 304; minimum thickness 22 gage, 0.03 inch.

B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
   1. Stainless Steel Guides: ASTM A666, Type 304, rollable temper.

C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.

D. Lock Hardware:
   1. Slide Bolt: Provide on both-jamb sides, extending into slot in guides, with padlock on one side.

E. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch.

C. Maximum Variation From Level: 1/16 inch.

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for hollow metal doors.

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 33 23 - Overhead Coiling Doors: Lockable coiling doors.

1.03 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 - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

C. BHMA A156.1 - American National Standard for Butts and Hinges; 2013.

D. BHMA A156.6 - American National Standard for Architectural Door Trim; 2010.

E. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2014.

F. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2010.

G. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.

H. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.

B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

C. Keying Meeting: Schedule key meeting within two weeks of awarding purchase order for finish hardware to establish keying requirements. Final hardware review and keying meeting can be held in conjunction with Security and Detention Equipment meeting required in Section 11 15 93.

D. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.
   1. Require attendance for the Project Manager, GC & superintendent, material supplier and installer.

E. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

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

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
   1. Approval of Schedule will in no way relieve the Contractor of his obligations to supply all hardware required for openings whether specified or not.

2. Prior to furnishing hardware, advise Architect of items that will not operate properly or are improper for conditions specified.
3. Include Owner-approved Keying schedule.

D. Keying Schedule: Submit for approval of Owner.

E. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

G. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

H. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
2. Extra Lock Cylinders: one for each new keyed group.
3. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

B. Hardware Supplier Qualifications: Company specializing in supplying the type of products specified in this section with at least five years documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

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

1.08 WARRANTY

A. See Section 01 77 00 - Closeout Submittals, for additional warranty requirements.
1. Warranty period to begin from date of Substantial Completion, not date of manufacture or installation.

B. Provide 5 year warranty for locksets.

C. Installing contractor to provide repair service on an on-going basis during the warranty period within 48 hours of notice of problem.
1. At end of warranty period, contractor may offer Owner a contract for continuing maintenance.

PART 2 PRODUCTS

2.01 DOOR HARDWARE - GENERAL

A. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

B. Provide items of a single type of the same model by the same manufacturer.

C. Provide products that comply with the following:
1. Applicable provisions of federal, state, and local codes.
2. Accessibility: ADA Standards and ICC A117.1.
3. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.

D. Function: Lock and latch function numbers and descriptions of manufactures series as listed in hardware schedule.

E. Finishes: Identified in schedule.

2.02 FASTENERS

A. Furnish hardware with all appropriate screws, bolts and other fasteners of suitable size and type to anchor hardware in position for a long life under hard use. Install hardware with fasteners furnished by the hardware manufacturer. USE ONLY MANUFACTURER FURNISHED FASTENERS. USE OF ANY OTHER FASTENERS WILL VOID LABEL AND WARRANTY. TEK SCREWS ARE NOT ACCEPTABLE.

B. Mount exit devices, door closers, and overhead controls with Thru-Bolts (TB SNB) to wood and hollow metal doors. Provide template machine screws for installation of exit devices, closers and overhead controls on aluminum doors.

C. Furnish fasteners where necessary with expansion shields, toggle bolts and other anchors appropriate to the material to which the hardware is to be applied and conforming to the recommendation of the hardware manufacturer.

2.03 HINGES

A. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle, button tip, full mortise butt hinges with non-rising loose pins unless scheduled otherwise.
      a. Provide ball-bearing hinges at all doors.
   2. Provide hinges in the quantities indicated.

B. Butt Hinges: Comply with BHMA A156.1 and A156.7; heavy weight, unless otherwise indicated.
   1. Provide hinge width required to clear surrounding trim.

C. Quantity of Hinges Per Door:
   1. Doors up to 60 inches High: Two hinges.

D. Manufacturers - Hinges:
   1. Assa Abloy Brands; McKinney: www.assaabloydss.com/#sle.
   2. Bommer Industries, Inc: www.bommer.com.
   3. Hager Companies: www.hagerco.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. Hardware Sets indicate locking functions required for each door.
   2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   3. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Keying: To match existing facility locksets, and keyed-alike in sets as required.
   1. Permanent keying to be handled between the Owner, the Architect and the lock supplier.
      a. The lock supplier to deliver permanent keys directly to the Owner. A receipt, signed by the Owner, will evidence the delivery.

2.05 CYLINDRICAL LOCKSETS

A. Manufacturers - Cylindrical Locksets:
   1. Assa Abloy Corbin Russwin: www.assaabloydss.com.
   2. Best Access Systems, division of Stanley Security Solutions: www.bestaccess.com/#sle.
   3. Schlage, an Allegion brand; AL Series: www.allegion.com/us/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
   1. Provide wall stops, unless otherwise indicated.
   2. If wall stops are not practical, due to configuration of room or furnishings, provide floor stops.

a. In Corridors and hallways, locate floorstops 4 inches (102 mm) maximum from wall.

B. Wall Stops: Rockwood Mfg. #416 (Basis of Specification)

C. Floor Stops: Rockwood Mfg. #441H (Basis of Specification)

D. Manufacturers - Wall and Floor Stops/Holders:
   1. Rockwood Manufacturing: www.rockwoodmfg.com
   2. Assa Abloy Brands; McKinney: www.assaabloydss.com/#sle.
   3. Hager Companies: www.hagerco.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Do not install surface mounted items until finishes applied to substrate are complete.

D. Mounting heights for hardware from finished floor to center line of hardware item.
   1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."

3.03 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 40 00.

3.04 ADJUSTING

A. Adjust hardware for smooth operation.

B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.05 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.06 PROTECTION

A. Protect finished Work under provisions of Section 01 70 00.

B. Do not permit adjacent work to damage hardware or finish.

3.07 DOOR SCHEDULE - SECTION 08 11 14.

3.08 HARDWARE SCHEDULE

A. **Hardware Set B03 STORAGE / JANITOR** - Operation - Storeroom function lockset - Latchbolt retracted by lever inside or key outside - Outside lever rigid at all times. Each door to receive:

1.	3 EA	Hinge	T4A2714 4.5x4.5	26D	McKinney
2.	1 EA	STOREROOM LOCK	AL-80-P-S	626	Schlage
3.	1 EA	Wall Stop	405	26D	Rockwood
4.	3 EA	Silencers	608	Grey	Rockwood

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. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Gypsum sheathing.

E. Gypsum wallboard.

F. Joint treatment and accessories.

G. Steel Security mesh.

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.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014, with Editorial Revision (2015).

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2017.

F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2018a.

G. 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; 2015.

H. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

J. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2018a.

K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.

L. ASTM F1267 - Standard Specification for Metal, Expanded, Steel Type 2, Class 1 mill finish

M. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

1.04 SUBMITTALS

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

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

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

E. Foreign produced gypsum wallboard WILL NOT BE ACCEPTED.
   1. Canadian-produced gypsum wallboard shall not be considered a foreign produced.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum five years of documented experience.

B. Single Source Responsibility: Obtain each type of gypsum wallboard and related joint treatment materials from a single manufacturer.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com/#sle.
   2. Phillips Manufacturing Company: www.phillipsmfg.com.
   3. Simpson Strong-Tie; Product Cold Formed Steel Construction.: www.strongtie.com
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 7.5 psf.
   1. In no case shall framing components be less than 20 gauge.
   2. Studs: "C" shaped with flat or formed webs.
   3. Runners: U shaped, sized to match studs.
   4. Ceiling Channels: C-shaped.
   5. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

D. 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 S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.

E. Steel Expanded Metal Panels (Security Mesh): ASTM F 1267 Type 2, Class 1; flattened expanded steel mesh as a penetration barrior behind gypsum board walls and ceilings.
   1. Material: Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, Type 2, Class 1 mill finish.
   2. Mesh Size Opening: 0.688 inch x 1.782 inch; 73% open area.
   3. Mesh Strand Thickness: 0.119 inch.
   4. Weight: 0.75 lbs per square foot. (mill finish)
   5. Panel Size: 4 foot x 8 foot.
      a. Anchor clips: Provide anchor clips specifically designed and supplied by maufacturer for attaching mesh panels to supporting framing members.
   6. Basis of Design: Alabama Metal Industries Corporation; ASM .75-13F.
      a. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:

1. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
2. National Gypsum Company: www.nationalgypsum.com/#sle.
3. USG Corporation: www.usg.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. All gypsum wallboard used to be Type 'X' or Type 'C' fire-rated core.
2. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   a. Mold resistant board is required at all locations.
4. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
5. Thickness:
   a. Vertical Surfaces: 5/8 inch.
   b. Ceilings: 5/8 inch.
   c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
6. Mold Resistant Paper Faced Products:
   a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
   b. National Gypsum Company; Gold Bond Hi-Abuse Brand XP Wallboard.
   c. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels AR.
   d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Impact Resistant Wallboard:
1. Application: .Vertical surfaces and Ceilings
2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Hard Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
8. Glass Mat-Faced Type: Gypsum wallboard as defined in ASTM C1658/C1658M.
9. Thickness:
   a. Vertical Surfaces: 5/8 inch
10. Edges: Tapered.
11. Products:
    a. National Gypsum Company; eXP Interior Extreme AR Wallboard.
    b. USG Corporation; Fiberock Brand Panels--VHI Abuse-Resistant.
    c. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 ACCESSORIES

A. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, 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.
3. Products:
   a. Same manufacturer as framing materials.
   b. Phillips Manufacturing Co: www.phillipsmfg.com.
   c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
1. Ready-mixed vinyl-based joint compound.

C. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
   1. Provide stainless steel screws at cementious backer board and wet locations.

D. 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.

E. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling and soffit system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.

C. Studs: Space studs as indicated.
   1. Extend partition framing as indicated.
   2. 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. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs. Add horizontal blocking at strike level to next stud in wall.

E. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet partitions.
   5. Toilet accessories.
   6. Wall mounted door hardware.
   7. Marker/White Boards and Tack Boards.
   8. Wall mounted Televisions.

3.03 STEEL EXPANDED METAL PANELS (SECURITY MESH) INSTALLATION

A. Installation and lay-out shall be approved by Architect prior to start of work.

B. Security Mesh panels may be installed with diamond pattern running in either direction.
   1. Security mesh shall be installed on the secure side of the framing at perimeter locations.

C. Manufacturer approved anchor clips shall be installed to secure the mesh to the framing members.
   1. Panels shall begin, join, or teminate on a framing member.
   2. Panel joints may either join staggered or butted together

3.04 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 Non-Rated: Install gypsum board parallel to framing, with ends and edges occurring over firm bearing.

C. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

D. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. At exterior soffits, not more than 30 feet apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.06 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.

B. 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.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

C. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.07 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 51 00
SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

C. Supplementary acoustical insulation above ceiling.

1.02 RELATED REQUIREMENTS

A. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.

B. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.

C. Section 28 46 00 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.

E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

G. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, 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.

1.05 SUBMITTALS

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

B. Product Data: Provide data on suspension system components.

C. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of acoustical units.

D. Samples: Submit two samples each, 12 inches long, of suspension system main runner.

E. Manufacturer's Installation Instructions: Indicate special procedures.

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 Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 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:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. USG: www.usg.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:
   1. Same as for acoustical units.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACOUSTICAL UNITS

A. Acoustical Tile Type 1: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. Size: As indicated on the drawings.
   2. Thickness: 5/8 inches.
   3. Composition: Water felted.
   4. Light Reflectance: 0.83 percent, determined in accordance with ASTM E1264.
   5. NRC Range: 0.54 to 0.60, determined in accordance with ASTM E1264.
   6. Ceiling Attenuation Class (CAC): 33, determined in accordance with ASTM E1264.
   7. Edge: Square.
   8. Surface Color: White.
   9. Surface Pattern: Fine Texture.
   10. Suspension System: Exposed grid.
   11. Products:
      a. USG Astro ClimaPlus; www.USG.com.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 SUSPENSION SYSTEM(S)

A. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.
   3. Finish: White painted.
   4. Products:
      a. USG Donn Brand AX.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

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. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Acoustical Insulation: Specified in Section 07 21 00.

PART 3 EXECUTION

3.01 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. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

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

E. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

F. 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.

G. 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.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. 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.

3.02 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. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

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

H. Install hold-down clips on each panel to retain panels tight to grid system where indicated on the plans.

3.03 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.

B. Installation accessories.

1.02 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2017.

B. ASTM F1861 - Standard Specification for Resilient Wall Base; 2016.

C. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

1.03 SUBMITTALS

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

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Architect will select Manufacturer and color of base to be installed, prior to the start of this portion of work, and in sufficient time to place the orders.

D. Verification Samples: Submit two samples, 6 inch in size illustrating color and pattern for each resilient base product specified.

E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

G. 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 Wall Base: Quantity equivalent to 5 percent of each type and color.

1.04 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. Protect roll materials from damage by storing on end.

1.05 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

B. 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 (WB-01): ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
   2. Height: 4 inch.
   3. Thickness: 0.125 inch thick.
   4. Profile: Standard toe (cove).
   5. Finish: Matte.

6. Length: Roll.
7. Color: As selected by Architect (manufacturer and color of their choice).
8. Accessories: Premolded external corners and internal corners.
    a. Site formed external corners, 45 degrees or less, shall be allowed
9. Manufacturers (from which the Architect will choose):
    a. Johnsonite, a Tarkett Company: www.johnsonite.com.
    b. Roppe Corp: www.roppe.com.
    c. Mannington Mills, Inc: www.mannington.com.

2.02 ACCESSORIES

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

B. Moldings, Transition and Edge Strips: Manufacturers and Products as noted below:.
    1. Accessory Type TR-01, Wheeled Traffic Transition:
        a. Product: Johnsonite CTA-XX-J; Color: As indicated on the Finish Schedule.
    2. Accessory Type TR-02, Wheeled Traffic Transition:
        a. Product: Johnsonite CTA-XX-H; Color: As indicated on the Finish Schedule.

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.

3.02 PREPARATION

A. Prepare wall substrates as recommended by manufacturers.

B. Prohibit traffic until filler is fully cured.

C. Clean substrate.

D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION - GENERAL

A. Install in accordance with manufacturer's written instructions.

B. Spread only enough adhesive to permit installation of materials before initial set.

C. Fit joints and butt seams tightly.

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 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.

3.05 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.06 PROTECTION

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

END OF SECTION

SECTION 09 67 10

TROWEL APPLIED SEAMLESS FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Section 09 90 00 - Painting and Coating

1.02 SUMMARY

A. Definition: Trowel applied seamless flooring includes systems in which the topping component, combined with selected fine aggregates, is continuously bonded to a supporting substrate to produce a thin, monolithic wearing surface. Build up edges to slope floor to drain, and provide threshold as detailed.

B. Install a two-component, liquid applied, urethane waterproofing membrane on concrete floor prior to applying seamless flooring.

C. Locations of trowel applied seamless flooring systems are indicated on the Drawings – shower floor on slab and drying areas in front of showers. Not required on mezzanine level showers in cells.

D. Apply to kitchen floor as noted on drawings and finish schedule.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, installation instructions, and general recommendations for each flooring material required. Include certification indicating compliance of materials with requirements.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 similar flooring applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture,

1.06 PROJECT CONDITIONS

A. Environmental Conditions: Comply with flooring manufacturer's directions for maintenance of substrate temperatures, ventilation, and other conditions required to execute and protect work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Product: Drawings and specifications are based on Tnemec heavy abuse flooring system.

B. Equivalent products of the following manufacturers are also acceptable:
   1. Dura-Flex, inc.
   2. Desco Coatings.
   3. Florock Products
   4. Substitutions: Section 01 60 00 - Product Requirements.

C. Physical Properties: Provide flooring system in which physical properties of topping including aggregate, when tested in accordance with standards referenced below, are as follows:
   1. Compressive Strength (ASTM C 579): 5000 psi.
   2. Adhesive Strength (MIL-D-3134): 250 psi.

3. Tensile Strength (ASTM C 190): 2300 psi.

D. Manufacturer: Tnemec medium (skid resistant)
   1. Primer: 201 Expoxoprime. DFT 6.0 - 8.0 mils.
   2. Intermediate: 239 Chemtread, trowel applied. DFT 1/ 4".
   3. Finish: 280 Tneme-Glaze. DFT 6.0 - 8.0 mils.
   4. Total Dry Thickness: Thickness. As indicated on drawings – slope to drain.
   5. Non-Slip Aggregate: Ceramic quartz.

2.02 JOINT SEALANT MATERIALS

A. Type recommended by manufacturer of flooring system for type of service and joint condition indicated.

2.03 WATERPROOFING MEMBRANE

A. Apply two-component, liquid applied, urethane membrane to fully cured and prepared concrete substrate prior to applying trowel applied seamless flooring. Membrane is to seal concrete substrate, bridge minor cracks and flaws, and isolate the seamless flooring.
   1. Stonproof ME7 by Stonhard Coatings is approved. Similar products as approved by Trowel Applied Seamless Flooring manufacturer are acceptable.

PART 3 - EXECUTION

3.01 SUBSTRATE PREPARATION

A. General: Perform preparation and cleaning procedures in compliance with flooring manufacturer's instructions for particular substrate conditions involved, and as herein specified.

B. Concrete Surfaces: Comply with surface preparation requirements of ASTM C 811 unless otherwise required by manufacturer's instructions.

C. Cure concrete floors a minimum of 28 days at or above 70 deg F to a visibly dry surface. Do not permit the use of curing or hardening agents on areas to be covered with flooring system.

D. Remove accumulation of laitance by acid cleaner recommended by flooring system manufacturer.

E. Remove all dirt, mortar and other accumulations by scraping, brushing, sweeping and vacuuming.

F. Place plastic control strips as directed by flooring system technical representative. Minimum spacing is 20 ft.

G. Install waterproofing membrane according to manufacturer's instructions.

3.02 MATERIALS PREPARATION

A. Carefully mix and prepare materials used in flooring system in compliance with manufacturer's instructions.

3.03 APPLICATION

A. General: Apply flooring system in compliance with manufacturer's directions to produce a uniform monolithic wearing surface as indicated or required.

B. Primer Coat: Apply primer over prepared substrate at manufacturer's recommended spreading rate. Coordinate timing of primer application with application of topping mix to insure optimum adhesion between flooring materials and substrate.

C. Troweled Application of Topping Mix: Trowel-apply topping mix including fine aggregates or fillers over freshly applied primer in number of coats and at spreading rates required to produce minimum thickness indicated. Check thickness at frequent and regular intervals by method recommended by manufacturer. Perform finish troweling as work proceeds.

D. Remove trowel marks by power sanding.

E. Sealing Coat: After topping mix has cured sufficiently, apply finish coat of type required to produce non-slip finish as recommended by manufacturer; minimum coverage 1 pound per 25 sq. ft.

F. Cove Base: Apply floor system to wall surfaces and cabinet bases to form base with radius cove and a height of 4". Round interior and exterior corners.

3.04 FIELD QUALITY CONTROL

A. The right is reserved to invoke following material testing procedure at any time, and any number of times during period of flooring application.

B. The Owner will engage service of an independent testing laboratory to sample materials being used. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.

C. Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if no referenced, in manufacturer's product data.

D. If test results show materials being used do not comply with specified requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.05 CURING, CLEANING AND PROTECTION

A. Cure flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process.

B. Protect flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose comply with manufacturer's recommendations for protective materials and method of application. Remove temporary covering and clean flooring just prior to final inspections. Use cleaning materials and procedures recommended by flooring manufacturer.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Scope: Finish all interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Exposed surfaces of steel lintels and ledge angles.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so 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, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically so indicated.
   8. Ceramic and other tiles.
   9. Glass.
   10. Acoustical materials, unless specifically so indicated.
   11. Concealed pipes, ducts, and conduits.

1.02 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.03 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 D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

1.04 SUBMITTALS

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

B. Product Data: Provide complete list of all 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. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three 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 definitely not required.

D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

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 Paint and Coatings: 1 gallon of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.

B. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

C. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years documented experience and approved by manufacturer.

D. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates.
   1. Furnish information on characteristics of finish materials to ensure use of compatible primers and top coats.

1.06 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.

D. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.07 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 exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Base Manufacturer: Sherwin-Williams Company: www.sherwin-williams.com.
   2. Benjamin Moore & Co: www.benjaminmoore.com/#sle.
   3. Pratt & Lambert Paints: www.prattandlambert.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Block Fillers: Same manufacturer as top coats.

E. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings 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. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each coating material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings 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.

D. Flammability: Comply with 2015 International Building Code for surface burning characteristics.

E. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.
   2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
   3. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   4. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
   5. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the Finish Schedule.

2.03 PAINT SYSTEMS - INTERIOR

A. Concrete/Unit Masonry, Opaque, Epoxy, 3 Coat (Unless otherwise indicated on Finish Schedule):
   1. Walls and ceilings – pre-catalyzed water based epoxy
   2. One coat of block filler; Sherwin Williams 'PrepRite' Latex Block Filler - B25W25
   3. Eggshell: Two coats of Epoxy-Modified Latex; Sherwin Williams 'Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45 Series.

B. Ferrous Metals, Unprimed, Acrylic, 3 Coat:
   1. One coat of primer; Sherwin Williams Pro-Cryl Universal Primer, B66-310 Series.
   2. Semi-gloss: Two coats of acrylic enamel; Sherwin Williams Pro Industrial Acrylic Coating, B66-650 Series.

C. Ferrous Metals (door and window frames), Primed, Acrylic, 2 Coat:
   1. Touch-up with primer recommended by top coat manufacturer.

2. Semi-gloss: Two coats of acrylic enamel; Sherwin Williams Pro Industrial Acrylic Coating, B66-650 Series.

D. Gypsum Board, Epoxy, 3 Coat:
   1. Walls and Ceilings - Pre-catalyzed water based epoxy
   2. One coat of latex primer sealer; Sherwin-Williams ProMar 200 Zero VOC Latex Primer - B28W2600.
   3. Eggshell: Two coats of acrylic epoxy; Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45 Series.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: As specified by manufacturer.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others.
   1. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

D. Remove surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
   1. Note requirements for security fasteners in secure areas, and do not replace with standard fasteners.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

1. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

H. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

I. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

J. Shop-Primed Steel Surfaces to be Finish Painted: 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.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's instructions.
   1. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer.
   2. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.

B. "Exposed surfaces" includes areas visible when permanent or built in fixtures, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.

C. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Apply each coat to uniform appearance.

G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

H. Sand wood and metal surfaces lightly between coats to achieve required finish.

I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing. Note security screws required in secure areas-do not use standard screws to reinstall.

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 finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 11 40 00
FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Food service equipment; Furnishing, delivery to site, uncrating, setting, leveling and or scribing to walls and floor, as required all Food service equipment.

B. Connections to utilities; For all equipment furnished under this section.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between equipment and adjacent walls, floors, and ceilings.

B. Section 22 10 05 - Plumbing Piping.

C. Section 26 05 83 - Equipment Wiring Connections: Electrical characteristics and wiring connections.

1.03 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; 2017.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

C. ASTM C1036 - Standard Specification for Flat Glass; 2011.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NSF/ANSI Standard No.7 - Commercial Refrigerators and Freezers; 2009.

G. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

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

B. Product Data: Provide data on appliances; indicate configuration, sizes, materials, finishes, locations, and utility service connection locations, service characteristics, and wiring diagrams.

C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

D. Certificates: Certify that products of this section meet or exceed specified requirements.

E. Operation Data: Provide operating data for the specified equipment .

F. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules .

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of standard products of the type specified.

B. General Contractor (GC) is responsible for coordinating, providing, installing, and commissioning all of the various food service equipment specified or shown in these Contract Documents. Upon completion of the project all equipment is to be completely operational as intended per the Contract Documents.

1. GC shall verify all utility sizes and locations as shown are correct for the equipment to be supplied.

C. Before any floor is poured, GC and KEC shall check all utility rough-ins, wall openings, floor depressions, and notify the Architect and the Sub-Contractor involved, in writing, of any errors, and/or omissions.

D. Furnish all electrical service fixtures directly attached to the equipment.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for utility requirements.

B. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

C. Manufacture and install all equipment in strict compliance with all codes, regulations, and requirements of the State of IowaDepartment of Health, all local Health and Sanitation Authorities, and the National Sanitation (NSF) Standard #2.

D. Kitchen Equipment Contractor shall coordinate and pay for all State and or local agency reviews, inspections and permits that may be required by jurisdictions having authority over food service facilities.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store products clear of floor in a manner to prevent damage.

B. Coordinate size of access and route to place of installation.
1. Cost of removal and rebuilding of in-place, new construction required for access shall be born soley by the General Contractor.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work of this section within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for replacement or repair of scheduled equipment, refrigerant and compressors, including disconnection and removal of defective unit, and connection of replacement unit. Warranty is minimum of five years or manufacturer's warranty period if greater than five years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers and products listed in Kitchen & Laundry Acccessories, Sheet A1.41 form the Basis of Specification.
1. All equipment is to be bid as specified.
2. Products of other manufacturers, equivalent in every aspect, will be considered if submitted in writing for approval by the Architect.
   a. Provide sufficient data to indicate suitability of proposed substitution.
   b. Kitchen Equipment Contractor assumes all responsibility for substituted equipment as to size, clearances, supply, connections, and mechanical requirements that may differ from those specified.
3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 EQUIPMENT

A. Equipment Schedule: Refer to Kitchen & Laundry Accessories, Sheet A1.41.
1. All Equipment Eligible for Energy Star Rating: Energy Star Rated.
2. Cooler and Freezer Units: Listed by UL (DIR).
3. Electrical Wiring and Components and Self-Contained Refrigeration Systems: Conform to UL (DIR) listed product standards.

B. Walk-In Cooler / Freezer: Site assembled combination cooler / freezer, basis of specification: ThermoKool Co: (www.thermokool.com).

1. Operating temperatures:
    a. Cooler: 34 degrees (F)
    b. Freezer: -10 degrees (F)
2. Wall Panels: 4 inch (101.6 mm) thick modular panels formed of inner and outer 0.040 inch (1 mm) stucco-embossed aluminum pans with "foamed-in-place" HFC 134a Class 1 Urethane foam conforming to ASTM E-84 permanently bonded to both skins.
    a. Panel height: 7'-6" (2.286 m)
    b. Perimeter structure shall be formed of high-density urethane insulation forming tongues and grooves for vapor and air tight joints.
    c. Panels shall be joined with cam-action hook arms and self-centering, self-aligning pins.
        1) No metal straps or connection rods used inside the panels.
    d. Panel joints shall be sealed with NSF-approved double-bead vinyl gasketing applied to the tongue side of all panels.Gaskets shall be impervious to stains, grease, oils, midew, etc.
3. Floor Panels (cooler/freezer): Shall be similar in construction to wall panels and shall be designed to support uniformly distributed, stationary loads, of 600 psf. (2.929 kg/sq. meter).
    a. Floor will not be covered with tile or concrete.
    b. Provide vinyl "U" channel screeds (at cooler). Screeds to be covered on interior and exterior sides and designed to sit flat on the floor for attachement by means of lag-bolting through the center of the screed.
    c. Provide interior ramp at door opening to cooler and freezer.
4. Doors: Standard 34 inch x 76 inch (863.6 x 1930.4 mm) hinged, flush mounted entrance doors bearing the UL seal.
    a. Provide a reinforced steel "U" channel frame, foamed-in-place for support and to prevent racking or warping.
    b. Finish to match adjacent wall panels
    c. Provide one-piece, NSF-approved, PVC accordian type removable perimeter gasket with magnetic core at jambs and head with adjustable wiper gasket at the bottom.
5. Lights: Include vapor-proof ceiling mounted light fixtures intended for freezer use in both sections.
    a. Fixtures to be equal to or better than "Day-Brite VaporLume"Model V2WAE248HO-120-1/2-EB-TR
6. Refrigeration: Remote refrigeration system, for field installation by refrigeration, plumbing and electrical sub-contractors.
    a. Refer to sheet FSK 1.1 for equipment locations.
    b. Remote components shall include condensing units, evaporator coils, control kits (pressure, thermostat, line drier, expansion valve, etc) and evaporator coil mounting kit.
    c. Power:
        1) Refrigeration: 208/240-6-3
        2) Lighting: 115-60-1

C. Stainless Steel Wall Panels: Nominal 48 inch (1.2 m) wide by height of wall with 1/2 inch (13 mm) offset construction one side for overlapping installation.
1. Material: 0.016 inch (0.41 mm) or as recommended by manufacturer for height of panels.
2. Finish: #4 (satin).
3. Accessories: Inside corners and Outside corners. Continuous full height.
    a. 3-1/2 inch (89 mm) minimum return with 1/2 inch (13 mm) offset both edges.
    b. Construction Adhesive: Waterproof, mildew-resistant adhesive as recommended by wall panel manufacturer.

D. Equipment Installation Accessories: Provide all rough-in hardware, supports and connections, attachment devices, closure trim, and accessories required for complete installation.

2.03 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

B. Stainless Steel Sheet: ASTM A666 Type 304 commercial grade, No. 4 finish.

C. Sheet Aluminum: ASTM B209 (ASTM B209M).

D. Finish Hardware: Manufacturer's standard.

E. Work Surfaces: Stainless steel.

F. Fittings: Sink drains with crumb cup and waste fittings, faucets, and electrical outlets.

G. Service Outlet Covers and Escutcheons: Stainless Steel.

H. Sealants: Seal joints and bases as specified in Section 07 92 00.

I. Adhesives: Waterproof, mildew-resistant adhesives as recommended by manufacturer.

2.04 FABRICATION

A. Install rubber button feet on bearing surface of any item positioned on a finished surface.

B. Provide indirect drain piping from equipment to terminate over nearest waste receptor.

C. Accommodate site installation of other services or equipment.

D. Grinding, Polishing, and Finishing:

1. Weld all joints, including field joints, unless otherwise specified. Grind flush with adjoining material and neatly finish to harmonize with adjoining surfaces.

2.05 FINISHES

A. All Components: Shop finish.

B. Metal (Except Stainless Steel): Degrease and phosphate etch, prime and apply minimum two coats factory baked epoxy, color as selected.

C. Stainless Steel: No. 4 finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify ventilation outlets, service connections, and supports are correct and in required location.

B. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install items in accordance with manufacturers' instructions.

B. Insulate to prevent electrolysis between dissimilar metals.

C. Weld and grind joints in steel work tight, without open seams, where necessary due to limitations of sheet sizes or installation requirements.

D. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved.

E. Use anchoring devices appropriate for equipment and expected usage.

F. Provide food-grade, mildew resistant, sealant to achieve clean joint with adjacent building finishes and between abutting components.

3.03 ADJUSTING

A. Adjust equipment and apparatus to ensure proper working order and conditions.

B. Remove and replace equipment creating excessive noise or vibration.

3.04 CLEANING

A. Remove masking or protective covering from stainless steel and other finished surfaces.

B. Wash and clean equipment.

C. Polish glass, plastic, hardware, accessories, fixtures, and fittings.

3.05 CLOSEOUT ACTIVITIES

A. At completion of work, provide qualified and trained personnel to demonstrate operation of each item of equipment and instruct Owner in operating procedures and maintenance.
   1. Test equipment prior to demonstration.
   2. Individual Performing Demonstration: Fully knowledgeable of all operating and service aspects of equipment.

3.06 PROTECTION

A. Remove protective coverings from prefinished work.

B. Protect finished work from damage.

END OF SECTION

SECTION 220523
GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Bronze ball valves.

B. Related Sections:
   1. Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
   2. Section 221116 "Domestic Water Piping" for valves applicable only to this piping.

1.02 DEFINITIONS

A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
D. NRS: Nonrising stem.
E. OS&Y: Outside screw and yoke.
F. RS: Rising stem.
G. SWP: Steam working pressure.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of valve indicated.

1.04 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:
   1. ASME B31.9 for building services piping valves.

C. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Protect internal parts against rust and corrosion.
   2. Protect threads, flange faces, grooves, and weld ends.
   3. Set ball valves open to minimize exposure of functional surfaces.
   4. Block check valves in either closed or open position.

B. Use the following precautions during storage:
   1. Maintain valve end protection.
   2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Refer to valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valves shall be manufactured in the United States of America.

D. Valve Sizes: Same as upstream piping unless otherwise indicated.

E. Valve Actuator Types:
   1. Handlever: For quarter-turn valves NPS 6 and smaller.

F. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
   1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

G. Valve-End Connections:
   1. Solder Joint: With sockets according to ASME B16.18.
   2. Threaded: With threads according to ASME B1.20.1.

H. Valve Bypass and Drain Connections: MSS SP-45.

2.02 BRONZE BALL VALVES

A. Two-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Conbraco Industries, Inc.; Apollo Valves.
    b. Hammond Valve.
    c. Milwaukee Valve Company.
    d. NIBCO INC.
2. Description:
    a. Standard: MSS SP-110.
    b. SWP Rating: 150 psig.
    c. CWP Rating: 600 psig.
    d. Body Design: Two piece.
    e. Body Material: Bronze.
    f. Ends: Threaded.
    g. Seats: PTFE or TFE.
    h. Stem: Stainless steel.
    i. Ball: Stainless steel, vented.
    j. Port: Full.
    k. Valves used for domestic water systems shall be certified lead-free.

2.03 BALANCING VALVES

A. Manufacturers:
    1. Bell and Gosset Circuit Setter Plus Lead-Free Brass.
B. Features:
    1. Integral Valve read-out ports.
    2. Calibrated name plate.
    3. Memory Stop Screw/Button.
    4. Lead Free Brass Body.
    5. Drain/Purge connection.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
C. Examine threads on valve and mating pipe for form and cleanliness.
D. Do not attempt to repair defective valves; replace with new valves.

3.02 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
B. Locate valves for easy access and provide separate support where necessary.
C. Install valves in horizontal piping with stem at or above center of pipe.
D. Install valves in position to allow full stem movement.

3.03 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.04 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:
    1. Shutoff Service: Ball valves.
B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.
C. Select valves, except wafer types, with the following end connections:
    1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.

3.05 DOMESTIC, HOT- AND COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
2. Ball Valves: Two piece, full port, bronze with stainless-steel trim.

3.06 DOMESTIC, HOT-WATER RECIRCULATING VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:
1. Balancing Valve: Lead free.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 220529
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Metal pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Metal framing systems.
   4. Thermal-hanger shield inserts.
   5. Fastener systems.
   6. Pipe positioning systems.
   7. Equipment supports.

1.03 DEFINITIONS

A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.04 PERFORMANCE REQUIREMENTS

A. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
   1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
   2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.05 ACTION SUBMITTALS

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

B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
   1. Trapeze pipe hangers.
   2. Metal framing systems.
   3. Pipe stands.
   4. Equipment supports.

1.06 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.07 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.01 METAL PIPE HANGERS AND SUPPORTS

A. Copper Pipe Hangers:
   1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
   2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel or stainless steel.

2.02 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.03 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Cooper B-Line, Inc.
      b. Flex-Strut Inc.

c. Unistrut Corporation; Tyco International, Ltd.

2. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
3. Standard: MFMA-4.
4. Channels: Continuous slotted steel channel with inturned lips.
5. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
6. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
7. Metallic Coating: Electroplated zinc or hot-dipped galvanized.

2.04 THERMAL-HANGER SHIELD INSERTS

A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.

B. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

C. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

D. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.05 FASTENER SYSTEMS

A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless- steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.06 PIPE POSITIONING SYSTEMS

A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.07 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.08 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Nonstaining, noncorrosive, and nongaseous.
2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use

operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Install lateral bracing with pipe hangers and supports to prevent swaying.

J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at changes in direction of piping.

K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

M. Insulated Piping:

1. Attach clamps and spacers to piping.
   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
   b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
   c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
   a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
   a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.02 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.03 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.04 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.05 PAINTING

A. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.06 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

F. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Use thermal-hanger shield inserts for insulated piping and tubing.

I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
2. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
3. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
4. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
5. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
6. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
7. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
9. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
10. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.

3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
6. C-Clamps (MSS Type 23): For structural shapes.
7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.
13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

O. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

P. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

Q. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 220719
PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes insulating the following plumbing piping services:
   1. Domestic cold-water piping.
   2. Domestic hot-water piping.
   3. Domestic recirculating hot-water piping.
   4. Supplies and drains for handicap-accessible lavatories and sinks.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied, if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
   2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
   3. Detail removable insulation at piping specialties, equipment connections, and access panels.
   4. Detail application of field-applied jackets.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

C. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

B. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
   1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

C. Comply with the following applicable standards and other requirements specified for miscellaneous components:
   1. Supply and Drain Protective Shielding Guards: ICC A117.1.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

1.07 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

C. Coordinate installation and testing of heat tracing.

1.08 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule" article for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Mineral-Fiber, Preformed Pipe Insulation:

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Johns Manville; Micro-Lok.
   b. Knauf Insulation; 1000-Degree Pipe Insulation.
   c. Owens Corning; Fiberglas Pipe Insulation.
2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.02 INSULATING CEMENTS

A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.

B. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449.

2.03 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

1. For indoor applications, adhesive shall have a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. PVC Jacket Adhesive: Compatible with PVC jacket.

1. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.04 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below-ambient services.

1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
2. Service Temperature Range: Minus 20 to plus 180 deg F.
3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
4. Color: White.

C. Breather Mastic: Water based; suitable for indoor and outdoor use on above-ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
2. Service Temperature Range: Minus 20 to plus 180 deg F.
3. Solids Content: 60 percent by volume and 66 percent by weight.
4. Color: White.

2.05 SEALANTS

A. ASJ Flashing Sealants, and Vinyl, PVDC, and PVC Jacket Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.

4. Color: White.
5. For indoor applications, sealants shall have a VOC content of 420 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.06 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
1. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

2.07 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.
B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D 1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Johns Manville; Zeston.
b. P.I.C. Plastics, Inc.; FG Series.
c. Proto Corporation; LoSmoke.
d. Speedline Corporation; SmokeSafe.
2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

2.08 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
1. Width: 3 inches.
2. Thickness: 11.5 mils.
3. Adhesion: 90 ounces force/inch in width.
4. Elongation: 2 percent.
5. Tensile Strength: 40 lbf/inch in width.
6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
B. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Width: 2 inches.
2. Thickness: 6 mils.
3. Adhesion: 64 ounces force/inch in width.
4. Elongation: 500 percent.
5. Tensile Strength: 18 lbf/inch in width.

2.09 SECUREMENTS

A. Bands:
1. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing seal or closed seal.
B. Staples: Outward-clinching insulation staples, nominal 3/4-inch- wide, stainless steel or Monel.
C. Wire: 0.062-inch soft-annealed, stainless steel.

2.10 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Piping Enclosures:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Truebro; a brand of IPS Corporation.
b. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
2. Description: Manufactured plastic enclosure for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with ADA requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
   1. Verify that systems to be insulated have been tested and are free of defects.
   2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Surface Preparation: Clean and prepare surfaces to be insulated.

C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

D. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.03 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
   3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
   4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
   1. Draw jacket tight and smooth.
   2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
   3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
      a. For below-ambient services, apply vapor-barrier mastic over staples.
   4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
   5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above-ambient services, do not install insulation to the following:
   1. Vibration-control devices.
   2. Testing agency labels and stamps.
   3. Nameplates and data plates.
   4. Cleanouts.

Q. Provide identification on outside of insulation covering valves, strainers, unions, etc.

3.04 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.

C. Insulation Installation at Floor Penetrations:
   1. Pipe: Install insulation continuously through floor penetrations.
   2. Seal penetrations through fire-rated assemblies.

3.05 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
   1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
   2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
   3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
   4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
   5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
   6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
   7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for

above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

8. For services not specified to receive a field-applied jacket install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "union." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges, except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2 inches over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

3.06 INSTALLATION OF MINERAL-FIBER INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

C. Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.07 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

3.08 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Underground piping.
   2. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.09 INDOOR PIPING INSULATION SCHEDULE

A. Domestic Cold Water:
   1. NPS 1 and Smaller: Insulation shall be the following:
      a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
   2. NPS 1-1/4 and Larger: Insulation shall be the following:
      a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

B. Domestic Hot and Recirculated Hot Water:
   1. NPS 1-1/4 and Smaller: Insulation shall be the following:
      a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.
   2. NPS 1-1/2 and Larger: Insulation shall be the following:
      a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

C. Exposed Sanitary Drains, Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

3.10 INDOOR, FIELD-APPLIED JACKET SCHEDULE

A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.

B. If more than one material is listed, selection from materials listed is Contractor's option.

C. Piping, Concealed:
   1. None.

D. Piping, Exposed (in accessible plumbing chases or mechanical rooms):
   1. PVC: 20 mils thick.

END OF SECTION 220719

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 221116
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Aboveground domestic water pipes, tubes, and fittings inside buildings.

1.02 ACTION SUBMITTALS

A. Product Data: For transition fittings and dielectric fittings.

1.03 INFORMATIONAL SUBMITTALS

A. System purging and disinfecting activities report.
B. Field quality-control reports.

1.04 FIELD CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
   1. Notify Design Professional and Owner no fewer than two days in advance of proposed interruption of water service.
   2. Do not interrupt water service without Owner's written permission.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
B. Potable-water piping and components shall comply with NSF 14 and NSF 61.

2.02 COPPER TUBE AND FITTINGS

A. Hard Copper Tube: ASTM B 88, Type L water tube, hard temper.
B. Soft Copper Tube: ASTM B 88, Type K water tube, annealed temper.
C. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper fittings.
D. Copper Unions:
   1. MSS SP-123.
   2. Cast-copper-alloy, hexagonal-stock body.
   3. Ball-and-socket, metal-to-metal seating surfaces.
   4. Solder-joint or threaded ends.

2.03 PIPING JOINING MATERIALS

A. Solder Filler Metals: ASTM B 32, 95/5 tin/antimony, lead-free alloys.

2.04 DIELECTRIC FITTINGS

A. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
B. Dielectric Unions:
   1. Standard: ASSE 1079.
   2. Pressure Rating: 125 psig minimum at 180 deg F.
   3. End Connections: Solder-joint copper alloy and threaded ferrous.
C. Dielectric Flanges:
   1. Standard: ASSE 1079.
   2. Factory-fabricated, bolted, companion-flange assembly.
   3. Pressure Rating: 125 psig minimum at 180 deg F.
   4. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
D. Dielectric-Flange Insulating Kits:
   1. Nonconducting materials for field assembly of companion flanges.
   2. Pressure Rating: 150 psig.
   3. Gasket: Neoprene or phenolic.
   4. Bolt Sleeves: Phenolic or polyethylene.
   5. Washers: Phenolic with steel backing washers.
E. Dielectric Nipples:
   1. Standard: IAPMO PS 66.
   2. Electroplated steel nipple complying with ASTM F 1545.

3. Pressure Rating and Temperature: 300 psig at 225 deg F.
4. End Connections: Male threaded or grooved.
5. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.
B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
C. Install shutoff valve immediately upstream of each dielectric fitting.
D. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
E. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
F. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
G. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
H. Install piping to permit valve servicing.
I. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than the system pressure rating used in applications below unless otherwise indicated.
J. Install piping free of sags and bends.
K. Install fittings for changes in direction and branch connections.
L. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
M. Install sleeves for piping penetrations of walls, ceilings, and floors.
N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.02 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
C. Soldered Joints for Copper Tubing: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
D. Joints for PEX Tubing: Join according to ASTM F 1960 for cold expansion fittings and reinforcing rings.
E. Joints for Dissimilar-Material Piping: Make joints using adapters compatible with materials of both piping systems.

3.03 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings, nipples or unions.
C. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges or nipples.

3.04 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hanger, support products, and installation in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
   1. Vertical Piping: MSS Type 8 or 42, clamps.
   2. Individual, Straight, Horizontal Piping Runs:
      a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
      b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
      c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
   3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
   4. Base of Vertical Piping: MSS Type 52, spring hangers.
B. Support vertical piping and tubing at base and at each floor.
C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
   2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
   3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
   4. NPS 2-1/2: 108 inches with 1/2-inch rod.

E. Install supports for vertical copper tubing every 10 feet.

3.05 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. When installing piping adjacent to equipment and machines, allow space for service and maintenance.

3.06 IDENTIFICATION

A. Identify system components. Comply with requirements for identification materials and installation in Section 220553 "Identification for Plumbing Piping and Equipment."

B. Label pressure piping with system operating pressure.

3.07 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Piping Inspections:
      a. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
      b. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
         1) Roughing-in Inspection: Arrange for inspection of piping before concealing or closing in after roughing in and before setting fixtures.
         2) Final Inspection: Arrange for authorities having jurisdiction to observe tests specified in "Piping Tests" Subparagraph below and to ensure compliance with requirements.
      c. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
      d. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
   2. Piping Tests:
      a. Test piping underground and in chases and walls before piping is concealed.
      b. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
      c. Test piping before insulation is applied.
         1) If insulation is applied before pipe testing and a leak occurs which ruins the insulation, specify damaged insulation is replaced with new insulation by the Contractor at no cost to the Owner.
      d. Test piping with 100 psig water pressure or equivalent inert gas such as nitrogen.
      e. Hold test pressure for a minimum of 8 hours.
      f. Specify the test witnessed by the Design Professional if requested by the Owner's Representative
      g. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
      h. Repair leaks and defects with new materials, and retest piping or portion thereof until satisfactory results are obtained.
      i. Prepare reports for tests and for corrective action required.
      j. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.

B. Domestic water piping will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.08 ADJUSTING

A. Perform the following adjustments before operation:
   1. Open shutoff valves to fully open position.
   2. Adjust balancing valves in hot-water-circulation return piping to provide adequate flow.
      a. Manually adjust ball-type balancing valves in hot-water-circulation return piping to provide hot-water flow in each branch.
      b. Adjust calibrated balancing valves to flows indicated.

3.09 CLEANING

A. Clean and disinfect potable domestic water piping as follows:
   1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
   2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
      a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
      b. Fill and isolate system according to either of the following:
         1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
         2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
      c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
      d. Repeat procedures if biological examination shows contamination.
      e. Submit water samples in sterile bottles to authorities having jurisdiction.

B. Prepare and submit reports of purging and disinfecting activities. Include copies of water-sample approvals from authorities having jurisdiction.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.10 PIPING SCHEDULE

A. Aboveground domestic water piping, NPS 2-1/2 and smaller, shall be the following:
   1. Hard copper tube, ASTM B 88, Type L; wrought-copper, solder-joint fittings; and soldered joints.

END OF SECTION

SECTION 221119
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Vacuum breakers.
   2. Water pressure-reducing valves.
   3. Balancing valves.
   4. Strainers.
   5. Outlet boxes.
   6. Drain valves.
   7. Water-hammer arresters.
   8. Air vents.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings: For domestic water piping specialties.
   1. Include diagrams for power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

A. Potable-water piping and components shall comply with NSF 61 and NSF 14. All components shall be lead-free.

2.02 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.03 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:
   1. Standard: ASSE 1001.
   2. Size: NPS 1/4 to NPS 3, as required to match connected piping.
   3. Body: Bronze.
   4. Inlet and Outlet Connections: Threaded.
   5. Finish: Rough bronze.

2.04 WATER PRESSURE-REDUCING VALVES

A. Water Regulators:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Cash Acme; a division of Reliance Worldwide Corporation.
      b. Conbraco Industries, Inc.
      c. Honeywell International Inc.
      d. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
      e. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.
   2. Standard: ASSE 1003.
   3. Pressure Rating: Initial working pressure of 150 psig.
   4. Design Inlet Pressure: 80.
   5. Design Outlet Pressure Setting: 10.
   6. Body: Bronze for NPS 2 and smaller.
   7. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and NPS 3.

2.05 BALANCING VALVES

A. Copper-Alloy Calibrated Balancing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Armstrong International, Inc.
    b. ITT Corporation; Bell & Gossett Div.
    c. NIBCO Inc.
    d. TACO Incorporated.
    e. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
2. Type: Ball valve with two readout ports and memory-setting indicator.
3. Body: Bronze.
4. Size: Same as connected piping, but not larger than NPS 2.
5. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

B. Accessories: Meter hoses, fittings, valves, differential pressure meter, and carrying case.

2.06 STRAINERS FOR DOMESTIC WATER PIPING

1. Pressure Rating: 125 psig minimum unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller.
3. End Connections: Threaded for NPS 2 and smaller.
4. Screen: Stainless steel with round perforations unless otherwise indicated.
5. Perforation Size:
    a. Strainers NPS 2 and Smaller: 0.020 inch.
6. Drain: Factory-installed, hose-end drain valve.

2.07 OUTLET BOXES

A. Clothes Washer Outlet Boxes:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Acorn Engineering Company.
    b. Guy Gray Manufacturing Co., Inc.
    c. IPS Corporation.
    d. Oatey.
    e. Symmons Industries, Inc.
    f. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
    g. Zurn Industries, LLC; Plumbing Products Group; Light Commercial Products.
2. Mounting: Recessed.
3. Material and Finish: Stainless-steel box and faceplate.
4. Faucet: Combination valved fitting complying with ASME A112.18.1. Include garden-hose thread complying with ASME B1.20.7 on outlets.
5. Supply Shutoff Fittings: NPS 1/2 gate, globe, or ball valves and NPS 1/2 copper, water tubing.
6. Drain: 2 inch.

B. Icemaker Outlet Boxes:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Acorn Engineering Company.
    b. IPS Corporation.
    c. LSP Products Group, Inc.
    d. Oatey.
2. Mounting: Recessed.
3. Material and Finish: Enameled-steel or epoxy-painted-steel box and faceplate.
4. Faucet: Valved fitting complying with ASME A112.18.1. Include NPS 1/2 or smaller copper tube outlet.
5. Supply Shutoff Fitting: NPS 1/2 gate, globe, or ball valve and NPS 1/2 copper, water tubing.

2.08 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:
1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.

4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.09 WATER-HAMMER ARRESTERS

A. Water-Hammer Arresters:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. AMTROL, Inc.
   b. Josam Company.
   c. MIFAB, Inc.
   d. Precision Plumbing Products, Inc.
   e. Sioux Chief Manufacturing Company, Inc.
   f. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
   g. Tyler Pipe; Wade Div.
   h. Watts Drainage Products.
   i. Zurn Industries, LLC; Plumbing Products Group; Specification Drainage Products.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Metal bellows.
4. Size: ASSE 1010, Sizes AA and A through F, or PDI-WH 201, Sizes A through F.

2.10 AIR VENTS

A. Bolted-Construction Automatic Air Vents:
1. Body: Bronze.
2. Pressure Rating and Temperature: 125-psig minimum pressure rating at 140 deg F.
3. Float: Replaceable, corrosion-resistant metal.
4. Mechanism and Seat: Stainless steel.
5. Size: NPS 1/2 minimum inlet.
6. Inlet and Vent Outlet End Connections: Threaded.

2.11 FLEXIBLE CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Flex-Hose Co., Inc.
2. Flexicraft Industries.
3. Hyspan Precision Products, Inc.
4. Metraflex, Inc.

B. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
1. Working-Pressure Rating: Minimum 200 psig.
2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.

C. Stainless-Steel-Hose Flexible Connectors: Corrugated-stainless-steel tubing with stainless-steel wire-braid covering and ends welded to inner tubing.
1. Working-Pressure Rating: Minimum 200 psig.
2. End Connections NPS 2 and Smaller: Threaded steel-pipe nipple.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
B. Install balancing valves in locations where they can easily be adjusted.
C. Install Y-pattern strainers for water on supply side of each water pressure-reducing valve.
D. Install outlet boxes recessed in wall or surface mounted on wall. Install 2-by-4-inch fire-retardant-treated-wood blocking, wall reinforcement between studs.
E. Install water-hammer arresters in water piping according to PDI-WH 201.

F. Install automatic air vents at high points of water piping in mechanical equipment rooms. Install drain piping and discharge onto floor drain.

G. Install manual air vents at high points of water piping in all areas outside of mechanical equipment rooms. Manual vents shall include valve and threaded male connector for hose connection.

3.02 CONNECTIONS

A. Comply with requirements for ground equipment in Section 260526 "Grounding and Bonding for Electrical Systems."

3.03 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
   1. Pressure vacuum breakers.
   2. Water pressure-reducing valves.
   3. Calibrated balancing valves.
   4. Outlet boxes.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.04 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Test each pressure vacuum breaker according to authorities having jurisdiction and the device's reference standard.

B. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.05 ADJUSTING

A. Set field-adjustable pressure set points of water pressure-reducing valves.

B. Set field-adjustable flow set points of balancing valves.

C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.

END OF SECTION

SECTION 221316
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Pipe, tube, and fittings.
   2. Specialty pipe fittings.

1.02 PERFORMANCE REQUIREMENTS

A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
   1. Soil, Waste, and Vent Piping: 15-foot head of water.

1.03 ACTION SUBMITTALS

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

1.04 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.05 QUALITY ASSURANCE

A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.06 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
   1. Notify Architect and Owner no fewer than two days in advance of proposed interruption of sanitary waste service.
   2. Do not proceed with interruption of sanitary waste service without Owner's written permission.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.02 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 74, Service weight, coated inside and out.
B. Gaskets: ASTM C 564, molded elastomeric.
C. Calking Materials: ASTM B 29, pure lead and oakum.

2.03 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301, service weight, coated inside and out.
B. CISPI, Hubless-Piping Couplings:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Fernco Inc.
      b. MIFAB, Inc.
      c. Mission Rubber Company; a division of MCP Industries, Inc.
      d. Tyler Pipe.
   2. Standards: ASTM C 1277 and CISPI 310.
   3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.04 COPPER TUBE AND FITTINGS

A. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
B. Hard Copper Tube: ASTM B 88, Type L, water tube, hard temper.
C. Solder: ASTM B 32, 95/5 tin/antimony, lead free alloy with ASTM B 813, water-flushable flux.

2.05 SPECIALTY PIPE FITTINGS

A. Transition Couplings:
   1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.

2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
3. Unshielded, Nonpressure Transition Couplings:
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Dallas Specialty & Mfg. Co.
      2) Fernco Inc.
      3) Mission Rubber Company; a division of MCP Industries, Inc.
   b. Standard: ASTM C 1173.
   c. Description: Elastomeric, sleeve-type, reducing or transition pattern. Include shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.
   d. Sleeve Materials:
      1) For Cast-Iron Soil Pipes: ASTM C 564, rubber.
      2) For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

B. Dielectric Fittings:
1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
2. Dielectric Unions:
   a. Description:
      1) Standard: ASSE 1079.
      2) Pressure Rating: 125 psig minimum at 180 deg F.
      3) End Connections: Solder-joint copper alloy and threaded ferrous.
3. Dielectric Flanges:
   a. Description:
      1) Standard: ASSE 1079.
      2) Factory-fabricated, bolted, companion-flange assembly.
      3) Pressure Rating: 125 psig minimum at 180 deg F.
      4) End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.
4. Dielectric-Flange Insulating Kits:
   a. Description:
      1) Nonconducting materials for field assembly of companion flanges.
      2) Pressure Rating: 150 psig.
      3) Gasket: Neoprene or phenolic.
      4) Bolt Sleeves: Phenolic or polyethylene.
      5) Washers: Phenolic with steel backing washers.
5. Dielectric Nipples:
   a. Description:
      1) Standard: IAPMO PS 66
      2) Electroplated steel nipple.
      3) Pressure Rating: 300 psig at 225 deg F.
      4) End Connections: Male threaded or grooved.
      5) Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
E. Install piping to permit valve servicing.
F. Install piping at indicated slopes.
G. Install piping free of sags and bends.
H. Install fittings for changes in direction and branch connections.
I. Install piping to allow application of insulation.
J. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
K. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
L. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
    1. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
    2. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
N. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
O. Plumbing Specialties:
    1. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."
P. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
Q. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
R. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
S. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.02 JOINT CONSTRUCTION

A. Join hub-and-spigot, cast-iron soil piping with either gasket joints or lead and oakum calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
B. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
    1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
    2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
D. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.

E. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.

3.03 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:
   1. Install transition couplings at joints of piping with small differences in OD's.
   2. In Drainage Piping: Unshielded, nonpressure transition couplings.
   3. In Aboveground Force Main Piping: Fitting-type transition couplings.
   4. In Underground Force Main Piping:
      a. NPS 1-1/2 and Smaller: Fitting-type transition couplings.
      b. NPS 2 and Larger: Pressure transition couplings.

B. Dielectric Fittings:
   1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
   2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples or unions.
   3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.

3.04 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
   1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
   2. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
   3. Vertical Piping: MSS Type 8 or Type 42, clamps.
   4. Install individual, straight, horizontal piping runs:
      a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
      b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
      c. Longer Than 100 Feet if Indicated: MSS Type 49, spring cushion rolls.
   5. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
   6. Base of Vertical Piping: MSS Type 52, spring hangers.

B. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
   2. NPS 3: 60 inches with 1/2-inch rod.
   3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
   4. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.

F. Install supports for vertical cast-iron soil piping every 15 feet.

G. Install supports for vertical steel piping every 15 feet.

H. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
   1. NPS 1-1/4: 72 inches with 3/8-inch rod.
   2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
   3. NPS 2-1/2: 108 inches with 1/2-inch rod.

I. Install supports for vertical copper tubing every 10 feet.

J. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.05 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect drainage and vent piping to the following:
   1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
   2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.

3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
5. Comply with requirements for cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."

C. Make connections according to the following unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.06 IDENTIFICATION

A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.07 FIELD QUALITY CONTROL

A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test piping with water to prove tight.
2. Hydrostatically test soil, waste, and vent piping inside the building with 15 feet head of water and allow to stand for 1 hour for inspection before connecting fixtures.
    1) If a leak appears, repair and repeat the test.
    2) Water test force mains at a pressure equal to 1.5 times the operating pump discharge pressure.
3. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
4. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.08 CLEANING AND PROTECTION

A. Clean interior of piping. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.09 PIPING SCHEDULE

A. Aboveground, soil and waste piping NPS 1-1/2 and smaller shall be any of the following:
1. Copper tube, copper drainage fittings, and soldered joints.

B. Aboveground, soil and waste piping NPS 2 and larger shall be any of the following:
1. Bell-and-spigot, cast-iron soil pipe and fittings, with lead and oakum calked type or molded elastomeric gaskets with push-on joints.
2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
3. Dissimilar Pipe-Material Couplings: Unshielded, nonpressure transition couplings.

A. Aboveground, vent piping NPS 1-1/2 and smaller shall be any of the following:

1. Copper tube, copper drainage fittings, and soldered joints.

B. Aboveground, vent piping between NPS 2 and larger shall be any of the following:
   1. Bell-and-spigot, cast-iron soil pipe and fittings; with lead and oakum calked type or molded elastomeric gaskets with push-on joints.
   2. Hubless, cast-iron soil pipe and fittings; CISPI hubless-piping couplings; and coupled joints.
   3. Dissimilar Pipe-Material Couplings: Unshielded, nonpressure transition couplings.

END OF SECTION

SECTION 221319
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Cleanouts.
2. Floor drains.
3. Floor sinks.
4. Miscellaneous sanitary drainage piping specialties.

1.02 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

1.03 ACTION SUBMITTALS

1.04 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For drainage piping specialties to include in emergency, operation, and maintenance manuals.

1.06 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.01 CLEANOUTS

A. Exposed Metal Cleanouts:
1. ASME A112.36.2M, Cast-Iron Cleanouts:
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Josam Company.
2) Smith, Jay R. Mfg. Co.
3) Watts Drainage Products.
4) Zurn Plumbing Products Group.
2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
3. Size: Same as connected drainage piping
4. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
5. Closure: Countersunk or raised-head, brass plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Closure: Stainless-steel plug with seal.

B. Metal Floor Cleanouts:
1. ASME A112.36.2M, Cast-Iron Cleanouts:
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Josam Company.
2) Smith, Jay R. Mfg. Co.
3) Watts Drainage Products.
4) Zurn Plumbing Products Group.
2. Standard: ASME A112.36.2M for threaded, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Threaded, adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: Required.
7. Outlet Connection: Spigot.
8. Closure: Brass plug with straight threads and gasket.
9. Adjustable Housing Material: Cast iron with threads.
10. Frame and Cover Material and Finish: Nickel-bronze, copper alloy.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Heavy Duty.

13. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to cleanout.
14. Standard: ASME A112.3.1.
15. Size: Same as connected branch.
16. Housing: Stainless steel.
17. Closure: Stainless steel with seal.
18. Riser: Stainless-steel drainage pipe fitting to cleanout.

2.02 FLOOR DRAINS

A. Cast-Iron Floor Drains:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Josam Company; Josam Div.
b. Smith, Jay R. Mfg. Co.
c. Watts Drainage Products.
d. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Seepage Flange: Not required.
6. Anchor Flange: Required.
7. Clamping Device: Required.
8. Outlet: Bottom.
9. Coating on Interior and Exposed Exterior Surfaces: Acid-resistant enamel.
10. Sediment Bucket: Not required.
11. Top or Strainer Material: Nickel bronze.
12. Top of Body and Strainer Finish: Nickel bronze.
13. Top Shape: Round.
14. Top Loading Classification: Heavy Duty.
15. Funnel: Not required.
16. Inlet Fitting: Not required.
17. Trap Material: Cast iron.
18. Trap Pattern: Standard P-trap.
19. Trap Features: Trap-seal primer valve drain connection.

2.03 FLOOR SINKS

A. Characteristics and capacities listed on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

D. Install floor drains at low points of surface areas to be drained. Set grates of drains and sinks flush with finished floor, unless otherwise indicated.
1. Position floor drains for easy access and maintenance.
2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.

c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.

3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

E. Install deep-seal traps on floor drains and other waste outlets, if indicated.

F. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
2. Size: Same as floor drain inlet.

G. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

H. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.02 CONNECTIONS

A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.03 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.04 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 224216.16
COMMERCIAL SINKS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Utility sinks.
   2. Handwash sinks.
   3. Sink faucets.
   4. Supports.
   5. Supply fittings.
   6. Waste fittings.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for sinks.
   2. Include rated capacities, operating characteristics and furnished specialties and accessories.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sinks to include in maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed, but no fewer than one (1).
   2. Faucet Cartridges and O-Rings: Equal to 5 percent of amount of each type and size installed, but no fewer than one (1).

PART 2 - PRODUCTS

2.01 UTILITY SINKS

A. Utility Sinks (S-2): Stainless steel, freestanding.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Advance Tabco.
      b. Eagle Group.
      c. Elkay Manufacturing Co.
      d. Just Manufacturing.
   2. Fixture:
      a. Standard: ASME A112.19.3/CSA B45.4.
      b. Type: With backsplash.
      c. Number of Compartments: One.
      d. Overall Dimensions: 27 inches wide by 27.5 inches deep by 34 inches high.
      e. Metal Thickness: 0.050 inch.
      f. Compartment:
         1) Dimensions: 24 inches wide by 24 inches deep by 12 inches high.
         2) Drain: Grid with NPS 1-1/2 tailpiece and twist drain.
         3) Drain Location: Centered in compartment.
      g. Drainboard(s): Not required.
         1) Dimensions Each: Not applicable.
   3. Supports: Adjustable-length steel legs.
   4. Faucet(s): F-2.
      a. Number Required: One.
      b. Mounting: On backsplash.

5. Supply Fittings:
    a. Standard: ASME A112.18.1/CSA B125.1.
    b. Supplies: Chrome-plated brass compression stop with inlet connection matching water-supply piping type and size.
        1) Operation: Wheel handle.
        2) Risers: NPS 1/2, chrome-plated, soft-copper flexible tube.
6. Waste Fittings:
    a. Standard: ASME A112.18.2/CSA B125.2.
    b. Trap(s):
        1) Size: NPS 1-1/2.
        2) Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
        3) Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

2.02 HANDWASH SINKS

A. Handwash Sinks (S-1): Stainless steel, wall mounted.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. Advance Tabco.
    b. Eagle Group.
    c. Elkay Manufacturing Co.
    d. Just Manufacturing.
2. Fixture:
    a. Standards: ASME A112.19.3/CSA B45.4 and NSF/ANSI 2.
    b. Type: Basin with radius corners, back for faucet, and support brackets.
    c. Nominal Size: 25 by 20 by 10 inches.
3. Faucet: F-1.
4. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
5. Waste Fittings: Comply with requirements in "Waste Fittings" Article.
6. Support: Type II sink carrier..
7. Lavatory Mounting Height: Standard.

2.03 SINK FAUCETS

A. NSF Standard: Comply with NSF 372 for faucet-spout materials that will be in contact with potable water.
B. Sink Faucets (F-1): Manual type, two lever handle mixing valve.
1. Commercial, Solid-Brass Faucets:
    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
        1) Chicago Faucets; Geberit Company.
        2) Delta Faucet Company.
        3) Elkay Manufacturing Co.
        4) Just Manufacturing.
        5) Moen Incorporated.
        6) T&S Brass and Bronze Works, Inc.
2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and sink receptor.
4. Body Type: Widespread.
5. Body Material: Commercial, solid brass.
6. Finish: Chrome plated.
7. Maximum Flow Rate: 1.5 gpm.
8. Handle(s): Wrist blade, 4 inches.
9. Mounting Type: Back/wall, exposed.
10. Spout Type: Swing, solid brass.
11. Vacuum Breaker: Not required for hose outlet.

12. Spout Outlet: Aerator.
13. Thermostatic Mixing Valve Serving Hot Water Connection: ASSE 1069/1070 approved thermostatic mixing valve capable of controlling outlet temperature range between 95 degrees F and 115 degrees F. Valve shall have dial-type adjustment for controlling outlet temperature, and shall have integral checks.

C. Sink Faucets (F-2): Manual type, two lever handle mixing valve.
1. Commercial, Solid-Brass Faucets:
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1) Chicago Faucets; Geberit Company.
2) Delta Faucet Company.
3) Elkay Manufacturing Co.
4) Just Manufacturing.
5) Moen Incorporated.
6) T&S Brass and Bronze Works, Inc.
2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and sink receptor.
4. Body Type: Widespread.
5. Body Material: Commercial, solid brass.
6. Finish: Chrome plated.
7. Maximum Flow Rate: 1.5 gpm.
8. Handle(s): Wrist blade, 4 inches.
9. Mounting Type: Back/wall, exposed.
10. Spout Type: Swing, solid brass.
11. Vacuum Breaker: Required for hose outlet.
12. Spout Outlet: Hose thread according to ASME B1.20.7.

2.04 SUPPORTS

A. Type II Sink Carrier:
1. Standard: ASME A112.6.1M.

2.05 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF 372 for supply-fitting materials that will be in contact with potable water.
B. Standard: ASME A112.18.1/CSA B125.1.
C. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
D. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
E. Operation: Wheel handle.
F. Risers:
1. NPS 1/2.
2. Chrome-plated, soft-copper flexible tube.

2.06 WASTE FITTINGS

A. Standard: ASME A112.18.2/CSA B125.2.
B. Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.
C. Trap:
1. Size: NPS 1-1/2.
2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

2.07 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
B. Characteristics: Nonshrink; recommended for interior and exterior applications.
C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install sinks level and plumb according to roughing-in drawings.
B. Install supports, affixed to building substrate, for wall-hung sinks.
C. Install accessible wall-mounted sinks at handicapped/elderly mounting height according to ICC/ANSI A117.1.
D. Install water-supply piping with stop on each supply to each sink faucet.
    1. Exception: Use ball valves if supply stops are not specified with sink. Comply with valve requirements specified in Section 220523.12 "Ball Valves for Plumbing Piping."
    2. Install stops in locations where they can be easily reached for operation.
E. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings.
F. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.
G. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.03 CONNECTIONS

A. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
B. Comply with water piping requirements specified in Section 221116 "Domestic Water Piping."
C. Comply with soil and waste piping requirements specified in Section 221316 "Sanitary Waste and Vent Piping."

3.04 ADJUSTING

A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
B. Adjust water pressure at faucets to produce proper flow.

3.05 CLEANING AND PROTECTION

A. After completing installation of sinks, inspect and repair damaged finishes.
B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
C. Provide protective covering for installed sinks and fittings.
D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 230100
BASIC HVAC REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. If contradicting requirements are identified in different locations within the Contract Documents, the most stringent requirement listed shall apply.

1.02 SUMMARY OF WORK

A. Applicable provisions of General Conditions, Supplementary Conditions, and all sections in Division 1, General Requirements, shall govern work under this section.

B. Mechanical Work shall include:

1. All labor, materials, equipment, transportation, and operations required to install a complete HVAC system in accordance with these specifications and applicable drawings.
2. Coordination of work with all other trades. Contractor shall report discrepancies and/or conflicts to Engineer immediately, once these issues are discovered.
3. Other work as required to provide complete and operating mechanical systems.

1.03 RELATED WORK DESCRIBED ELSEWHERE

A. Provide under the appropriate Section, all cutting, patching, trenching, enclosures, openings, furring, equipment pads, excavation, backfilling, conduits, etc., incidental to the installation of the HVAC apparatus. Work shall be executed by qualified trades as shown on the Drawings and under the direction of this Section.

B. Electrical work: HVAC work shall include the installation of all motors, temperature controls, limit switches, etc., as herein specified. Electrical contractor shall provide all switches, pilot lights, fused and non-fused disconnect switches, outlets, motor starters, and necessary wiring and fuses to properly connect all mechanical and electrical equipment, unless devices or material are specified as being provided with equipment being served.

1.04 DEFINITIONS

A. “Contract Documents” means Contract Drawings and Specifications, including General Conditions, Supplementary Conditions, Division 1, and all technical Specification Sections.

B. “Furnish” means Contractor shall purchase indicated item and turn over to Owner at site for their use.

C. “Install” means set in place with all connections and appurtenances.

D. “Provide” means furnish and install referenced item with all appurtenances.

E. “Shall” indicates a mandatory requirement.

F. “Or Equal” is defined as approved as equal by the Owner’s Authorized Representative.

G. “Engineer”, “Design Professional”, or “Design Professional/Engineer” shall refer to mechanical consulting engineer whose seal covers mechanical drawings for this project. All three terms shall be considered synonymous for the purposes of this contract.

1.05 PROJECT SITE CONDITIONS

A. Project Building Site is existing facility, and will be Owner occupied during portions of the construction period. Certain tasks are will to occur when building is fully occupied. Contractor shall be responsible for scheduling work that will need to occur when building is occupied. This work shall be coordinated to minimize impact to normal building operations. Owner shall not be responsible for additional costs to complete necessary work outside of normally occupied hours.

B. Building houses correctional facility, courts, and other law enforcement functions. Contractor shall follow Owner’s requirements for use and storage of tools. All contractor personnel shall submit to background checks completed by the Owner, and shall be allowed to work on site at the Owner’s discretion.

C. Contractor shall be responsible for protecting existing equipment and materials in finished areas from dirt, dust and damage as a result of project work. This shall include providing protection over existing floor finishes to prevent damage or staining.

D. Coordinate with Owner to minimize conflict with Owner’s operations.

E. Any work requiring shut-down of utilities, such as electricity, domestic water, sewer, etc., shall be coordinated with Owner at least two weeks in advance, and shall not occur without Owner’s permission.

F. Contractor shall be responsible for securing all tools and materials stored on project site. Owner shall not be responsible for security of these items.

1.06 DELIVERY AND STORAGE OF MATERIALS

A. Provide for the safety and good condition of all materials and equipment until final acceptance by the Owner. Protect all materials and equipment from damage, and provide adequate and proper storage facilities for construction materials. Replace all damaged and defective work, material, or equipment prior to filing application for final acceptance.

B. Cap or plug openings in equipment, piping, ducts and other systems to exclude entrance of dirt and other foreign material during construction.

C. Material and equipment storage shall be Contractor's responsibility. Coordinate storage of materials and equipment prior to purchasing of materials. Contractor shall store equipment off-site, with delivery and mobilization of new equipment coordinated prior to commencing work.

1.07 CODES AND STANDARDS

A. All work and materials shall be in full accordance with the latest adopted rules and regulations of the following codes and Authority Having Jurisdiction:
   1. Iowa State Fire Marshall.
   2. International Building Code – 2015 Edition.
   3. International Mechanical Code – 2015 Edition.
   4. International Energy Conservation Code – 2012 Edition.
   5. International Fire Code – 2015 Edition.
   6. Uniform Plumbing Code – 2015 Edition.
   7. National Electric Code – 2017 Edition.

B. Nothing included in these Specifications and Drawings is to be construed to permit work not conforming to these codes. When codes conflict with one another, provide larger, higher, or more restrictive standard.

1.08 PERMITS

A. Contractor shall obtain all permits required for performing included work, as required by all laws, ordinances, rules and regulations, or orders of any officer and/or body having jurisdiction. Provide all notices necessary in connection therewith, and pay all fees relating thereto, and all costs and expenses incurred on account thereof. No work shall be covered before inspection by the Authority or Authorities Having Jurisdiction, and by observation of the Engineer.

B. Contractor shall coordinate with Authority Having Jurisdiction inspection times and processes required for system to be operational within project limitations. Work requiring inspection shall not be concealed until approved by Authority Having Jurisdiction and observed by Owner and Engineer.

1.09 EXPLANATION AND PRECEDENCE OF DRAWINGS

A. Drawings and specifications are intended to be read together so that any work mentioned in only one location shall be executed as if mentioned in both.

B. For purposes of clearness and legibility, drawings are essentially diagrammatic, and, although size and location of equipment are drawn to scale where possible, Contractor shall make use of all data in all Contract Documents and shall verify information at Building Site. Some system components are shown distorted on Drawings for clarity.

C. Drawings indicate required size and points of termination for piping and ductwork, and suggest proper routes to conform to structure, avoid obstructions, and preserve clearances. It is not intended that drawings indicate all necessary offsets, and it shall be work of Contractor to complete installation in a manner to conform to structure, avoid obstructions, preserve headroom, and keep openings and passageways clear, without further instructions or cost to Owner.

D. All HVAC devices, ductwork, piping, etc. shall be located and/or routed symmetrically with other building elements (typically parallel or perpendicular).

E. Submittal of bid shall indicate Contractor has examined Building Site and Drawings and Specifications, and has included all required allowances in their bid. No allowances shall be made for any error resulting from Contractor's failure to visit Building Site and/or review Drawings and Specifications.

1.10 WORKMANSHIP

A. Qualifications of Tradespersons: Use sufficiently qualified tradespersons and competent supervisors in the execution of the work to ensure proper and adequate installation of systems and comply with project schedule.
B. All work shall be completed in a safe manner, complying with Occupational Health and Safety Administration requirements, as well as any other required or recommended safety procedures as governed by local codes or standards.
C. Welding shall be completed by individuals certified to complete the type of weld being performed, on the materials being welded.

1.11 WORK SEQUENCE AND COORDINATION

A. Coordinate schedule of work with other trades by providing adequate notice when work of mechanical trades will impact work of other trades, or when completion of work of other trades is required to perform work of mechanical trades.
B. Coordinate required dimensions for necessary openings, equipment locations, etc., with other trades, when work of other trades is necessary to complete work of mechanical trades.
C. Coordinate in advance with other trades the shape, size, and position of all necessary openings, sleeves, supports, etc., to avoid conflicts. Consult Engineer for resolution of unavoidable conflicts.
D. Refer to Division 26 Specifications for electrical work required for mechanical equipment. Verify that electrical characteristics of the mechanical equipment being provided are compatible with the project electrical power circuits available. Consult engineer for resolution if conflicts are discovered.

1.12 MATERIAL REQUIREMENTS

A. All materials and equipment shall be new, and of the latest design of the respective manufacturers. All material and equipment of the same classification shall be produced by the same manufacturer unless otherwise specified.
B. Where standards have been established by the following, equipment and materials shall conform to those standards with respect to quality, fabrication, and installation, and shall be not less than further required under this Specification.
    1. ASHRAE.
    2. Underwriters Laboratories, Inc. (UL).
    3. American National Standards Association (ANSI).
    4. National Fire Protection Association (NFPA).
    5. Occupational Safety and Health Administration (OSHA).
    6. Standards of local Building Codes.
    7. American Gas Association (AGA).

1.13 HAZARDOUS MATERIALS

A. If hazardous materials, including solvents or other products necessary to complete work, are stored on site, Contractor shall inform Owner and post Material Safety Data Sheets (MSDS), listing information about potential health or safety hazards, and mitigation procedures in the event of a spill or accident.
B. If Contractor or other personnel engaged in work of project encounter materials that are suspected to contain asbestos, notify Owner and Engineer immediately, and stop work if suspected materials have potential to become airborne.

1.14 SUBSTITUTIONS

A. Any proposal for a substitution shall be made in writing by Contractor, who shall submit full details for consideration and obtain written acceptance of Engineer.
B. Acceptance of proposed substitution by Engineer shall not relieve Contractor from their responsibility to provide a satisfactory installation of the Work, in accordance with the intent of Contract Documents, and shall not affect his guarantee covering all parts of the work.
C. Any material or equipment submitted for acceptance, which is arranged differently or of a different physical size and/or weight from that shown or specified, shall be accompanied by shop drawings indicating the different arrangements of size and the method of making various connections to equipment. Final results shall be compatible with system as designed.
D. Any additional cost, by this or other trades, resulting from substitution of equipment, shall be paid by Contractor.

1.15 SUBMITTALS

A. Shop Drawings: Before any materials are purchased or released for production, submit to Engineer one complete set of electronic shop drawings for each material type or piece of equipment, in Portable Document Format (PDF) file type, with electronically searchable text, proposed to be furnished and installed.
B. Shop drawings and submittals shall be grouped in sets to include complete submittals of related components, products, and accessories in a single submittal. Clearly mark each submittal item with appropriate Specification Section and Paragraph reference.
C. Contractor shall not purchase, or release for production, any material or equipment, until a copy of the corresponding submittal or shop drawing has been returned either "Approved" or "Approved as Noted". If a submittal or shop drawing is returned "Approved as Noted", all applicable notes shall be incorporated into purchased materials or equipment released for production.
D. Contractor shall perform thorough inspection of submittals prior to submitting for review by Engineer. Engineer shall perform up to two reviews of each submittal. If, after two reviews, submittal is not accurate, Contractor shall compensate Engineer on an hourly basis for subsequent reviews.
E. Engineer's review and approval of submittals does not relieve Contractor of responsibility to comply with requirements of Contract Documents. All deviations from Contract Documents shall be clearly noted at time of submittal being transmitted to Engineer.
F. Operation and Maintenance Manual: Upon completion of this portion of Work, and as a condition of its acceptance, deliver to Engineer two hard copies of a manual describing the system, bound in a three-ring binder. Provide one electronic copy of same information, in PDF file type, with electronically searchable text, or tabs within file to easily locate different types of material or equipment. Manual shall include, at a minimum, the following:
    1. Identification on front cover stating general nature of manual.
    2. Final versions of all reviewed and approved submittals and shop drawings.
    3. Complete instructions regarding operation and maintenance of all equipment included in scope of project.
    4. Complete name and address of nearest vendor of replaceable parts for all pieces of equipment.
    5. Copy of all guarantees and warranties issued.
    6. Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation.
G. Mark dimensions and values in units to match those specified.
H. Submittals shall be reviewed by, and carry the approval stamp of, Contractor, including initials of reviewer and date of review.
I. Submit certificate of final inspection and approval from Authority Having Jurisdiction, and record electrical drawings.

1.16 RECORD DRAWINGS

A. Provide and maintain on the project site one complete set of Drawings for the HVAC work. Carefully record on this set of Drawings all work, including ductwork, piping, valves, etc., which is installed differently from that indicated on the Drawings. This set of Drawings shall be referred to as the Record Drawing Set.
B. Record Drawing Set shall be regularly updated, to remain current with work, and shall be available for inspection by Owner and Engineer. Major discrepancies from approved submittals shall be clearly identified and resubmitted.
C. At completion of work, provide neat and legible, reproducible set of Record Drawing Set, which shall be individually signed and dated by Contractor and the job inspector as to their accuracy.
D. Record Drawing Set shall be submitted for acceptance and approval to the Owner's Authorized Representative before final certificate of acceptance will be issued.

1.17 CUTTING AND PATCHING

A. Contractor shall perform all cutting and fitting required for work of this section. Openings larger than duct or pipe shall be sealed or trimmed to close perimeter of opening to duct or pipe.
B. All patching of surfaces shall match adjacent material and finish.
C. Coordinate required lintel locations with contractor performing general construction work.

D. Where openings are provided in fire or smoke rated walls, Contractor shall patch or seal openings as necessary to maintain continuous rating of wall, in accordance with applicable codes and standards. Provide UL listed foam, caulk, putty or insulation at openings as necessary to maintain ratings. Submittal shall be provided indicating type of sealing assemblies to be used on project.

1.18 CLEANING AND DEBRIS REMOVAL

A. Contractor shall regularly clean work areas and remove construction debris from site to maintain clean, safe work environment. Contractor shall maintain work areas to allow Owner partially occupy facility and other contractors working on site will not be impacted by material or debris from work of this contract.

B. Final cleaning of all systems, equipment, and impacted areas, shall be completed prior to acceptance of work by Owner. Final cleaning shall include:
   1. Removal of all shipping and packing labels and accessories.
   2. Clean interior and exterior equipment surfaces.
   3. Remove any debris from site, roofs and drainage systems.
   4. Replace filters of operating equipment.

1.19 GUARANTEE/WARRANTY

A. Warrant all work and materials for a period of one year, commencing with acceptance by Owner of completed installation in accordance with Contract Documents. Replace any work, materials, equipment, or system, which develops defects within the warranty period, without cost to Owner. Specific equipment may require warranty period of greater than one year, and shall be complied with as noted within equipment specification.

B. Equipment not meeting performance requirements or capacities specified shall be considered defective, and shall be replaced at no cost to Owner.

C. Owner reserves right to make temporary or emergency repairs as necessary to keep equipment in operating condition without voiding guarantee contained herein nor relieving Contractor of their responsibilities during the guarantee period.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

THIS PAGE IS INTENTIONALLY LEFT BLANK

SECTION 230200
SELECTIVE HVAC DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Demolition and removal of indicated portions of building HVAC systems. All accessories, valves, dampers, supports, sensors, etc., located in indicated areas of demolition, shall be removed as well, unless otherwise indicated.

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.05 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.06 WORK BY OTHERS

A. Contractor shall coordinate work with that of other trades, including general, electrical and structural contractors, who may be providing work as part of separate contract.

1.07 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager’s and other tenants' on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Use of stairs.
   5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

D. Predemolition Photographs or Video: Submit before Work begins.

E. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.08 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Design Professional of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Hazardous materials are not expected to be present in buildings and structures to be selectively demolished.

1. If materials believed to be hazardous are encountered, contractor shall notify Owner and Engineer immediately, and shall stop work in areas adjacent to suspicious materials.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Design Professional.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.02 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area off-site.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Design Professional, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.03 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by building elevator or stairs. Coordinate pathways and time of use with Owner.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.05 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 233113
METAL DUCTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Single-wall rectangular ducts and fittings.
   2. Single-wall round ducts and fittings.
   3. Sheet metal materials.
   4. Sealants and gaskets.
   5. Hangers and supports.

B. Related Sections:
   1. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing requirements for metal ducts.
   2. Section 233300 "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.03 PERFORMANCE REQUIREMENTS

A. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"

B. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of the following products:
   1. Liners and adhesives.
   2. Sealants and gaskets.

B. Shop Drawings:
   1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
   2. Factory- and shop-fabricated ducts and fittings.
   3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
   4. Elevation of top of ducts.
   5. Dimensions of main duct runs from building grid lines.
   6. Fittings.
   7. Reinforcement and spacing.
   8. Seam and joint construction.
   9. Penetrations through fire-rated and other partitions.
   10. Equipment installation based on equipment being used on Project.
   11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
   12. Hangers and supports, including methods for duct and building attachment and vibration isolation.

1.05 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
   2. Suspended ceiling components.
   3. Structural members to which duct will be attached.
   4. Size and location of initial access modules for acoustical tile.
   5. Penetrations of smoke barriers and fire-rated construction.
   6. Items penetrating finished ceiling including the following:
      a. Luminaires.

b. Air outlets and inlets.
c. Speakers.
d. Sprinklers.
e. Access panels.
f. Perimeter moldings.

B. Welding certificates.

C. Field quality-control reports.

1.06 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-up."

C. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

PART 2 - PRODUCTS

2.01 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.02 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Ductmate Industries, Inc.
b. LaPine Metal Products.
c. McGill AirFlow LLC.
d. SEMCO LLC.
e. Sheet Metal Connectors, Inc.

B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.03 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
   1. Galvanized Coating Designation: G90.
   2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
   1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.04 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:
   1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
   2. Tape Width: 3 inches.
   3. Sealant: Modified styrene acrylic.
   4. Water resistant.
   5. Mold and mildew resistant.
   6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
   7. Service: Indoor and outdoor.
   8. Service Temperature: Minus 40 to plus 200 deg F.
   9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

C. Water-Based Joint and Seam Sealant:
   1. Application Method: Brush on.
   2. Solids Content: Minimum 65 percent.
   3. Shore A Hardness: Minimum 20.
   4. Water resistant.
   5. Mold and mildew resistant.
   6. VOC: Maximum 75 g/L (less water).
   7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
   8. Service: Indoor or outdoor.
   9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:
   1. Application Method: Brush on.
   2. Base: Synthetic rubber resin.
   3. Solvent: Toluene and heptane.
   4. Solids Content: Minimum 60 percent.
   5. Shore A Hardness: Minimum 60.
   6. Water resistant.
   7. Mold and mildew resistant.
   8. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
   9. Service: Indoor or outdoor.

10. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C 920.
1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.

F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

G. Round Duct Joint O-Ring Seals:
1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.05 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A 492.

F. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. Trapeze and Riser Supports:
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

PART 3 - EXECUTION

3.01 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.

B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install ducts in maximum practical lengths.

D. Install ducts with fewest possible joints.

E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

I. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

J. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

K. Where ducts pass through fire-rated interior partitions and exterior walls, install fire dampers. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.02 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.03 ADDITIONAL INSTALLATION REQUIREMENTS FOR CLOTHES DRYER EXHAUST DUCT

A. Duct shall be installed in accordance with dryer manufacturer’s instructions.

B. No sheet metal screws shall protrude into duct. Fittings shall be made with approved tape sealing system.

C. Fittings shall be installed to minimize potential for lint buildup in duct.

3.04 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts at a minimum to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Outdoor, Supply-Air Ducts: Seal Class A.
3. Outdoor, Exhaust Ducts: Seal Class C.
4. Outdoor, Return-Air Ducts: Seal Class C.
5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
7. Unconditioned Space, Exhaust Ducts: Seal Class C.
8. Unconditioned Space, Return-Air Ducts: Seal Class B.
9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
11. Conditioned Space, Exhaust Ducts: Seal Class B.
12. Conditioned Space, Return-Air Ducts: Seal Class C.

3.05 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
5. Do not use powder-actuated concrete fasteners for seismic restraints.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
D. Hangers Exposed to View: Threaded rod and angle or channel supports.
E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.06 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."
B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.07 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
B. Paint exposed galvanized sheet metal duct with an exterior surface ready to receive paint without field preparation other than normal cleaning.

3.08 FIELD QUALITY CONTROL

A. Perform tests and inspections.
B. Leakage Tests:
    1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
    2. Test the following systems:
        a. Ducts with a Pressure Class Higher Than 3-Inch wg: Test representative duct sections, selected by Architect from sections installed, totaling no less than 25 percent of total installed duct area for each designated pressure class.
        b. Supply Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
        c. Return Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
        d. Exhaust Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Architect from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
    3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
    4. Test for leaks before applying external insulation.
    5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
    6. Give seven days' advance notice for testing.
C. Duct System Cleanliness Tests:
    1. Visually inspect duct system to ensure that no visible contaminants are present.
D. Duct system will be considered defective if it does not pass tests and inspections.
E. Prepare test and inspection reports.

3.09 START UP

A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.10 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated.

B. Supply Ducts:

1. Ducts Connected to Fan Coil Units, Furnaces, Heat Pumps, and Terminal Units:
   a. Pressure Class: Positive 1-inch wg.
   b. Minimum SMACNA Seal Class: A.
   c. SMACNA Leakage Class for Rectangular: 12.
   d. SMACNA Leakage Class for Round and Flat Oval: 12.
2. Ducts Connected to Variable-Air-Volume Packaged Rooftop Units:
   a. Pressure Class: Positive 4-inch wg.
   b. Minimum SMACNA Seal Class: A.
   c. SMACNA Leakage Class for Rectangular: 3.
   d. SMACNA Leakage Class for Round and Flat Oval: 3.
3. Ducts Connected to Equipment Not Listed Above:
   a. Pressure Class: Positive 2-inch wg.
   b. Minimum SMACNA Seal Class: A.
   c. SMACNA Leakage Class for Rectangular: 3.
   d. SMACNA Leakage Class for Round and Flat Oval: 3.

C. Return Ducts:

1. Ducts Connected to Packaged Rooftop Units:
   a. Pressure Class: Positive or negative 3-inch wg.
   b. Minimum SMACNA Seal Class: A.
   c. SMACNA Leakage Class for Rectangular: 6.
   d. SMACNA Leakage Class for Round and Flat Oval: 6.
2. Ducts Connected to Equipment Not Listed Above:
   a. Pressure Class: Positive or negative 2-inch wg.
   b. Minimum SMACNA Seal Class: A.
   c. SMACNA Leakage Class for Rectangular: 3.
   d. SMACNA Leakage Class for Round and Flat Oval: 3.

D. Exhaust Ducts:

1. Ducts Connected to Packaged Rooftop Units:
   a. Pressure Class: Positive or negative 3-inch wg.
   b. Minimum SMACNA Seal Class: A if negative pressure, and A if positive pressure.
   c. SMACNA Leakage Class for Rectangular: 6.
   d. SMACNA Leakage Class for Round and Flat Oval: 3.
2. Ducts Connected to Equipment Not Listed Above:
   a. Pressure Class: Positive or negative 2-inch wg.
   b. Minimum SMACNA Seal Class: A if negative pressure, and A if positive pressure.
   c. SMACNA Leakage Class for Rectangular: 6.
   d. SMACNA Leakage Class for Round and Flat Oval: 3.

E. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel.

F. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
   a. Velocity 1000 fpm or Lower:
      1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
      2) Mitered Type RE 4 without vanes.
   b. Velocity 1000 to 1500 fpm:
      1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
      2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
      3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
   c. Velocity 1500 fpm or Higher:
      1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."
   a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
   b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
   c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."
3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."
   a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
      1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
      2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
      3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
      4) Radius-to Diameter Ratio: 1.5.
   b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
   c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

G. Branch Configuration:
1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."
   a. Rectangular Main to Rectangular Branch: 45-degree entry.
   b. Rectangular Main to Round Branch: Conical.
2. Round and Flat Oval: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.
   a. Velocity 1000 fpm or Lower: 90-degree tap.
   b. Velocity 1000 to 1500 fpm: Conical tap.
   c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION

SECTION 233346
FLEXIBLE DUCTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Insulated flexible ducts.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
B. Shop Drawings: For flexible ducts.
   1. Include plans showing locations and mounting and attachment details.

1.04 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted access panels and access doors required for access to duct accessories are shown and coordinated with each other, using input from installers of the items involved.

PART 2 - PRODUCTS

2.01 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
C. Comply with the Air Diffusion Council's "ADC Flexible Air Duct Test Code FD 72-R1."
D. Comply with ASTM E 96/E 96M, "Test Methods for Water Vapor Transmission of Materials."

2.02 INSULATED FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Flexmaster U.S.A., Inc.
   2. JP Lamborn Co.
   3. McGill AirFlow LLC.
   4. Ward Industries; a brand of Hart & Cooley, Inc.
B. Insulated, Flexible Duct: UL 181, Class 0, interlocking spiral of aluminum foil; fibrous-glass insulation; aluminized vapor-barrier film.
   1. Pressure Rating: 8-inch wg positive or negative.
   2. Maximum Air Velocity: 5000 fpm.
   3. Temperature Range: Minus 20 to plus 250 deg F.
   4. Insulation R-Value: R8.

2.03 FLEXIBLE DUCT CONNECTORS

A. Non-Clamp Connectors: Adhesive plus sheet metal screws.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install flexible ducts according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
B. Install in indoor applications only. Flexible ductwork should not be exposed to UV lighting.
C. Connect terminal units to supply ducts directly. No flexible duct shall be installed upstream of terminal units.
D. Connect diffusers or light troffer boots to ducts directly or with maximum 36-inch lengths of flexible duct clamped or strapped in place.
E. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.
F. Install duct test holes where required for testing and balancing purposes.
G. Installation:
   1. Install ducts fully extended.

2. Do not bend ducts across sharp corners.
3. Bends of flexible ducting shall not exceed a minimum of one duct diameter.
4. Avoid contact with metal fixtures, water lines, pipes, or conduits.
5. Install flexible ducts in a direct line, without sags, twists, or turns.

H. Supporting Flexible Ducts:
1. Suspend flexible ducts with bands 1-1/2 inches wide or wider and spaced a maximum of 48 inches apart. Maximum centerline sag between supports shall not exceed 1/2 inch per 12 inches.
2. Install extra supports at bends placed approximately one duct diameter from center line of the bend.
3. Ducts may rest on ceiling joists or truss supports. Spacing between supports shall not exceed the maximum spacing per manufacturer's written installation instructions.
4. Vertically installed ducts shall be stabilized by support straps at a maximum of 72 inches o.c.

END OF SECTION

SECTION 233713.13
AIR DIFFUSERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Rectangular and square ceiling diffusers.
   2. Louver face diffusers.
   3. Linear slot diffusers.

B. Related Requirements:
   1. Section 233300 "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers.
   2. Section 233713.23 "Air Registers and Grilles" for adjustable-bar register and grilles, fixed-face registers and grilles, and linear bar grilles.
   3. Section 233713.43 "Security Registers and Grilles" for security registers and security grilles.
   4. Section 233716 "Fabric Air-Diffusion Devices" for continuous tubular diffusers.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 RECTANGULAR AND SQUARE CEILING DIFFUSERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Krueger.
   2. Nailor Industries Inc.
   3. Price Industries.
   4. Titus.
   5. Raymon Danco.

B. Devices shall be specifically designed for variable-air-volume flows.
C. Material: Steel.
D. Finish: Baked enamel, white.
E. Face Size: 24 by 24 inches.
F. Face Style: Plaque.
G. Mounting: T-bar or solid ceiling as scheduled.
H. Pattern: Fixed.
I. Accessories:
   1. Equalizing grid.

2.02 PERFORATED DIFFUSERS (REFERRED TO AS GRILLE ON SCHEDULE)

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Krueger.
   2. Nailor Industries, Inc.
   3. Price Industries.
   4. Titus.
   5. Aneomstat.
   6. Raymon Danco.

B. Material: Steel backpan with steel face.
C. Finish: Baked enamel, white.
D. Face Size: 24 by 24 inches.
E. Duct Outlet: Round.
F. Mounting: T-bar or solid ceiling as scheduled.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install diffusers level and plumb.
B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final

locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.02 ADJUSTING

A. After installation, adjust diffusers to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

SECTION 260519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Copper building wire rated 600 V or less.
   2. Connectors, splices, and terminations rated 600 V and less.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers:

   1. American Insulated Wire Corp; a Leviton Company
   2. General Cable Corporation
   3. Senator Wire and Cable Company
   4. Southwire Company
   5. Approved Equal

C. Standards:
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
   2. RoHS compliant.
   3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:
   1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
   1. Material: Copper.
   2. Type: One hole with standard barrels.
   3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION

SECTION 260526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

2.3 CONDUCTORS

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

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.

D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.

G. Conduit Hubs: Mechanical type, terminal with threaded hub.

H. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

I. Straps: Solid copper, cast-bronze clamp. Rated for 600 A.

J. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Conductor Terminations and Connections:

1. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.

C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Grounding system will be considered defective if it does not pass tests and inspections.

C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 260529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Steel slotted support systems.
   2. Conduit and cable support devices.
   3. Structural steel for fabricated supports and restraints.
   4. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.
   1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
   2. Material for Channel, Fittings, and Accessories: Galvanized steel.
   3. Channel Width: Selected for applicable load criteria.
   4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
   5. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
   6. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.

B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.

D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
   2. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
   3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
   4. Toggle Bolts: All-steel springhead type.
   5. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
   1. NECA 1.
   2. NECA 101

B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slottedsupport system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
   1. Secure raceways and cables to these supports with two-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
3. To Existing Concrete: Expansion anchor fasteners.
4. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts.
5. To Light Steel: Sheet metal screws.
6. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

END OF SECTION

SECTION 260533
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1.1 SUMMARY

A. Section Includes:
   1. Metal conduits and fittings.
   2. Boxes, enclosures, and cabinets.

B. Related Requirements:
   1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:
   1. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. GRC: Comply with ANSI C80.1 and UL 6.
   3. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
      a. Comply with NEMA RN 1.
      b. Coating Thickness: 0.040 inch, minimum.
   4. EMT: Comply with ANSI C80.3 and UL 797.
   5. FMC: Comply with UL 1; zinc-coated steel.
   6. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.
   1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Fittings, General: Listed and labeled for type of conduit, location, and use.
   3. Fittings for EMT:
      a. Material: Steel.
      b. Type: compression.
   4. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
   5. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

D. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

E. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

F. Device Box Dimensions: 4 inches square by 2-1/8 inches deep and 4 inches by 2-1/8 inches by 2-1/8 inches deep.

G. Gangable boxes are prohibited.

H. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 and Type 4 with continuous-hinge cover with flush latch unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
   2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

I. Cabinets:

1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC.
   2. Concealed Conduit, Aboveground: EMT.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   4. Boxes and Enclosures, Aboveground: NEMA 250, Type 4.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
      a. Mechanical rooms.
   4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
   6. Damp or Wet Locations: GRC.
   7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
   3. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
   4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not fasten conduits onto the bottom side of a metal deck roof.

D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

E. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

F. Arrange stub-ups so curved portions of bends are not visible above finished slab.

G. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
H. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
I. Support conduit within 12 inches of enclosures to which attached.
J. Stub-ups to Above Recessed Ceilings:
    1. Use EMT, IMC, or RMC for raceways.
    2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
O. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
    1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
    2. Conduit extending from interior to exterior of building.
    3. Conduit extending into pressurized duct and equipment.
    4. Where otherwise required by NFPA 70.
R. Expansion-Joint Fittings:
    1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet.
    2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
        a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
        b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change for PVC conduits.
    4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
    5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
S. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires,]equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
    1. Use LFMC in damp or wet locations subject to severe physical damage.
    2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

T. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

U. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

V. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

W. Locate boxes so that cover or plate will not span different building finishes.

X. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

Z. Set metal floor boxes level and flush with finished floor surface.

AA. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 260553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Color and legend requirements for raceways, conductors, and warning labels and signs.
   2. Labels.
   3. Tapes.
   4. Cable ties.

PART 2 - PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Brady Corporation.
   2. Ideal Industries, Inc.
   3. Marking Services, Inc.
   4. Seton Identification Products.
   5. Approved Equal.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:
   1. Colors for 208/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
   2. Color for Neutral: White.
   3. Color for Equipment Grounds: Green.
   4. Colors for Isolated Grounds: Green with white stripe.

B. Warning Label Colors:
   1. Identify system voltage with black letters on an orange background.

C. Equipment Identification Labels:
   1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

B. Self-Adhesive Wraparound Labels: Write-on, 3-mil-thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
   1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
   2. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.

C. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
   1. Minimum Nominal Size:
      a. 1-1/2 by 6 inches for raceway and conductors.
      b. 3-1/2 by 5 inches for equipment.
      c. As required by authorities having jurisdiction.

2.4 TAPES

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

2.5 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   1. Minimum Width: 3/16 inch.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.
   4. Color: Black, except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.
   1. Minimum Width: 3/16 inch.
   2. Tensile Strength at 73 Deg F according to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.
   4. Color: Black.

2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
   1. Secure tight to surface of conductor, cable, or raceway.

H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

I. Vinyl Wraparound Labels:
   1. Secure tight to surface at a location with high visibility and accessibility.
   2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

J. Snap-around Labels: Secure tight to surface at a location with high visibility and accessibility.

K. Self-Adhesive Wraparound Labels: Secure tight to surface of raceway or cable at a location with high visibility and accessibility.

L. Self-Adhesive Labels:
   1. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
   2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

M. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.
   1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

N. Cable Ties: General purpose, for attaching tags, except as listed below:
   1. Outdoors: UV-stabilized nylon.
   2. In Spaces Handling Environmental Air: Plenum rated.

3.2 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.
   1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

D. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive wraparound labels with the conductor or cable designation, origin, and destination.

E. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive wraparound labels with the conductor designation.

F. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

G. Equipment Identification Labels:
   1. Indoor Equipment: Self-adhesive label.
   2. Outdoor Equipment: Laminated acrylic or melamine sign.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 262726
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standard-grade receptacles, 125 V, 20 A.
   2. GFCI receptacles, 125 V, 20 A.
   3. Toggle switches, 120/277 V, 20 A.
   4. Occupancy sensors.
   5. Wall plates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
B. Comply with NFPA 70.
C. RoHS compliant.
D. Comply with NEMA WD 1.
E. Device Color:
   1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
F. Wall Plate Color: For plastic covers, match device color.
G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:
   1. Description: Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Standards: Comply with UL 498 and FS W-C-596.

2.3 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:
   1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
   2. Configuration: NEMA WD 6, Configuration 5-20R.
   3. Type: Non-feed through.
   4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

2.4 TOGGLE SWITCHES, 120/277 V, 15 A

A. Single-Pole Switches, 120/277 V, 15 A:
   1. Standards: Comply with UL 20 and FS W-S-896.
B. Three-Way Switches, 120/277 V, 15 A:
   1. Comply with UL 20 and FS W-S-896.

2.5 OCCUPANCY SENSORS

A. Wall Switch Sensor Light Switch, Dual Technology:
   1. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
   2. Standards: Comply with UL 20.
   3. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
   4. Adjustable time delay of 15 minutes.
   5. Able to be locked to Automatic or Manual-On mode.
   6. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

2.6 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.
B. Single and combination types shall match corresponding wiring devices.
   1. Plate-Securing Screws: Metal with head color to match plate finish.

2. Material for Finished Spaces: Smooth, high-impact thermoplastic.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant thermoplastic with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:
1. 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.
2. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
3. Install wiring devices after all wall preparation, including painting, is complete.

C. Device Installation:
1. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
2. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

D. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

E. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.

C. Wiring device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION

SECTION 262816
ENCLOSED SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fusible switches.
   2. Nonfusible switches.
   3. Enclosures.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.4 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

C. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

A. Type HD, Heavy Duty:
   1. Single throw.
   2. Three pole.
   3. 240-V ac.
   4. 200 A and smaller.
   5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
   6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

2.3 NONFUSIBLE SWITCHES

A. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

PART 3 - EXECUTION

3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
   1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
   2. Outdoor Locations: NEMA 250, Type 3R.
   3. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
   4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.2 INSTALLATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
   1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
   2. Indicate method of providing temporary electric service.
   3. Do not proceed with interruption of electric service without Owner's written permission.
   4. Comply with NFPA 70E.

B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

C. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in fusible devices.

E. Comply with NFPA 70 and NECA 1.

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
   1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
   2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. Tests and Inspections for Switches:
   1. Visual and Mechanical Inspection:
      a. Inspect physical and mechanical condition.
      b. Inspect anchorage, alignment, grounding, and clearances.
      c. Verify that the unit is clean.
      d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
      e. Verify that fuse sizes and types match the Specifications and Drawings.
      f. Verify that each fuse has adequate mechanical support and contact integrity.
      g. Inspect bolted electrical connections for high resistance using one of the two following methods:
         1) Use a low-resistance ohmmeter.
            a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
         2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.

i. Verify correct phase barrier installation.

j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.

c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.

d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.

e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

1. Test procedures used.

2. Include identification of each enclosed switch and circuit breaker tested and describe test results.

3. List deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION

THIS PAGE IS
INTENTIONALLY
LEFT BLANK

SECTION 265119
LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following types of LED luminaires:
   1. Recessed, linear.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
   2. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.4 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
   1. Label shall include the following lamp characteristics:
      a. "USE ONLY" and include specific lamp type.
      b. Lamp diameter, shape, size, wattage, and coating.
      c. CCT and CRI.
C. Recessed luminaires shall comply with NEMA LE 4.
D. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
E. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
F. California Title 24 compliant.

2.2 RECESSED, LINEAR.

A. Nominal Operating Voltage: 120 V ac.
B. Lamp:
   1. Minimum allowable efficacy of 85 lm/W.
   2. CRI of minimum 80. CCT of 4100 K.
   3. Rated lamp life of 50,000 hours to L70.
   4. Dimmable from 100 percent to 0 percent of maximum light output.
   5. Internal driver.
   6. Lens Thickness: At least 0.125-inch minimum unless otherwise indicated.
C. Housings:
   1. Extruded-aluminum housing and heat sink.
   2. powder-coat painted finish.
   3. With integral mounting provisions.
D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Components are designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
E. Standards:
   1. ENERGY STAR certified.

2. RoHS compliant.
3. UL Listing: Listed for damp location.
4. NEMA LE 4.

2.3 MATERIALS

A. Metal Parts:
1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Steel:
1. ASTM A 36/A 36M for carbon structural steel.
2. ASTM A 568/A 568M for sheet steel.

C. Stainless Steel:
1. 1. Manufacturer's standard grade.
2. 2. Manufacturer's standard type, ASTM A 240/240 M.

D. Galvanized Steel: ASTM A 653/A 653M.

E. Aluminum: ASTM B 209.

2.4 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.5 LUMINAIRE SUPPORT

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.

D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Install lamps in each luminaire.

D. Supports:
1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Provide support for luminaire without causing deflection of ceiling or wall.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.2 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION