November 04, 2024

To: All Potential Respondents
From: Construction Procurement
Subject: RFQ 940500-02 DOC CBC 2 AMPB Building Renovations

Request for Quote

The State of Iowa is conducting a Request for Quote for a contractor to perform building renovations at DOC CBC 2 AMPB. See Exhibit B for additional details.

All work must be done on-site at DOC CBC 2 AMPB and all personnel must pass a background check. Information required for the background check includes full name, birthdate, state driver's license # or State id#, or social security number.

The work shall be completed no later than April 30, 2025.

The Project is located at 111 Sherman Avenue, Ames, Iowa 50010

Please upload your quote on the Exhibit A pricing form of this solicitation utilizing the Iowa IMPACS Procurement System (https://bids.sciquest.com/apps/Router/PublicEvent?CustomerOrg=DASIowa) prior to **November 26, 2024 at 2:00PM (CT).**

All questions regarding this solicitation must be received by email by **2:00 PM (CT) on November 15th, 2024. Questions** should be directed to construction.procurement@iowa.gov

An **optional** Pre-Bid meeting will be held on Tuesday, November 12, 2024, at 1:00 pm at DOC 2nd Judicial District at 111 Sherman Avenue Ames, Iowa 50010. This meeting is not mandatory but is highly recommended. Meet in the west lobby of the building. A virtual option is available for those who cannot meet in person: **Join the meeting now** Meeting ID: 293 922 380 595 Passcode: QsncNk Dial in by phone: Phone #: +1 515-612-9860 ID: 795 970 452#

Contract Terms and Conditions
This procurement will result in a Consensus 802 Agreement. By submitting a quote, respondent agrees to the contract terms and conditions available at:
https://das.iowa.gov/sites/default/files/procurement/pdf/ConsensusDoc802.pdf

Warranty
Respondent must provide a one-year warranty from the date of completion.

Performance Bond (include only if project is estimated at $25,000 or more)
Respondent must provide a Performance and Payment Bond in accordance with Section 10.8 of Consensus 802 Agreement.

Insurance Requirements
Prior to the start of the work, the respondent shall procure and maintain in force Workers Compensation/ Employers' Liability Insurance, Business Automobile Liability Insurance, and Commercial General Liability

Insurance (CGL). The CGL policy shall include coverage for liability arising from premises, operations, independent
contractors, products-completed operations, personal injury and advertising injury, contractual liability, and broad form property damage. The respondent's liability policies shall be written on an occurrence basis with at least the following limits of liability:

- Workers' Compensation – amount required by the laws of Iowa
- Employers' Liability Insurance - $500,000 or an amount required by Iowa law, whichever is greater.
- Business Automobile Liability Insurance - $1,000,000 Each Accident
- Commercial General Liability Insurance:
    - $1,000,000 Each Occurrence
    - $2,000,000 General Aggregate
    - $1,000,000 Products/Completed Operations Aggregate
    - $1,000,000 Personal and Advertising Injury Limit

The respondent must also carry and maintain Excess or Umbrella Liability coverage for the policies above in the amount of $2,000,000.

The respondent shall be required to purchase and maintain liability coverage, primary to the Owner's coverage. The additional liability coverage required of the respondent shall be:

1. Owner shall be named as an additional insured on respondent's Commercial General Liability Insurance specified for operations and completed operations, but only with respect to liability for bodily injury, property damage or personal and advertising injury to the extent caused by the negligent acts or omissions of respondent, or those acting on respondent's behalf, in the performance of respondent's Work.
2. Respondent shall provide an Owners' and Contractors' Protective Liability Insurance (OCP) policy with limits equal to the limits on Commercial General Liability Insurance specified or limits as otherwise required by Owner.

See sample Certificate of Insurance attached as Exhibit E for required limits, additional insured requirements and waiver of subrogation.

Exhibit A Pricing Form
DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

Please submit this completed form with your Quote to:
Iowa IMPACS Procurement System
(https://bids.sciquest.com/apps/Router/PublicEvent?CustomerOrg=DASIowa)

This form is to be completed in ink or typewritten.
Only pricing on this form or an exact copy of this form will be accepted.
Pricing Form shall be signed by an officer of the firm with authority to bind Respondent to Contract.

Respondent acknowledges receipt of the following Addenda (if issued) which are part of the RFQ documents:

Addendum No. _____Date_____

Addendum No._____ Date _____

The State reserves the right to reject any or all quotes without penalty and to waive minor deficiencies and informalities if, in the judgement of the State, it's best interests will be served.

Respondents must submit pricing for all scope of work items indicated per the attached Exhibit B. The State reserves the right to evaluate pricing. The State intends to make one Award for this project.

Bid Package #01 - Building Renovations Total $_____

Deductive Alternate #01 – IT Room Scope (Minus Mini Split) Total $_____

Deductive Alternate #02 – Mini Split $_____

Deductive Alternate #03 – Mechanical Screen $_____

Signature _____

Name (Print) _____

Title _____

Company _____

Address _____

City, St., Zip _____

Phone #_____ Fax **#**_____

E-mail _____

Exhibit B Scope of Work

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

SCOPE OF WORK

All scopes required for a complete building renovation per plans and specifications. Additional project specifications can be found in the drawings at: Mechanical System Replacements E700, M500, M501, P500, P501, P502 – IT Room Renovation M500, M501, E700.

Drawing Sheets: Mechanical System Replacement: C-101, M000, E000, E200, E201, E600, E700, M200, M201, M500, M501, P000, P200, P400, P500, P501, P502. IT Room Renovation: C-101, A-101, A-102, A-103, A-104, M000, M201, M500, M501, E000, E200, E201, E600, E700, V000, V201, COMPLETE.

1. The Contractor's Work includes all labor, supervision, materials, equipment, services, supplies, tools, facilities, transportation, hoisting, storage, receiving, licenses, inspections, certifications, overhead, profit, or other items required or reasonably inferable to properly and timely perform and complete all work and services to be performed by the Contractor pursuant to this Agreement. Unless specifically stated otherwise, incidental work required to accomplish the work of this Package shall be included in the quote. This would include, but not be limited to, temporary facilities, protection of the work, security of equipment, materials, and work in progress, etc. Contractor's Work shall be performed in accordance with the Drawings.
2. Contractors Package Shall include all work included in the Project Drawings.
3. Contractor to provide a deduct alternate (#01) for the IT Room scope in its entirety (minus the mini-Split). This will include all materials and labor.
4. Contractor to provide a deduct alternate (#02) for the Mini-Split. This will include all materials and labor to install.
5. Contractor to provide a deduct alternate (#03) for the exterior mechanical screen. This will include all materials and labor to install.
6. Contractor to be responsible for any permitting costs associated with this project to include electrical permitting.
7. Contractor responsible for scheduling and required inspections.
8. Contractors will be responsible for supplying their own dumpster for the removal of any debris associated with their scope to include any fees.
9. Weekly or bi-weekly virtual coordination meetings will be held during construction. The contractor will be responsible for trying to have a representative at these meetings.
10. Contractor is responsible for all labor and equipment to unload, accounting for all material delivered, stock, and delivery for this scope of work. Storage and delivery of materials and equipment at the Site shall be permitted only to the extent approved in advance by the Construction Manager, and if anything, so stored obstructs the progress of any portion of the work, it shall be promptly removed or relocated by the Contractor without reimbursement.
11. On-site supervision by Prime Contractor at all times work by that contractor or their subcontractors/suppliers is taking place.
12. Contractor shall provide all equipment and tools for Contractor's own cleanup. Clean up shall be done at the end of every shift or more frequently if required for the Contractor to perform their work, for other Contractors to perform their work, as required by the Owner's operations, and at the discretion of the Construction Manager.

13. All turf, landscaping, and subgrade disturbances caused by equipment traffic or other activities related to the Contractor's scope shall be repaired or restored to proper conditions by the Contractor.
14. Protect adjacent existing building elements from damage from Scope of work. Repair existing building elements damaged during Contractor's Scope of work.
15. Each Contractor is responsible for performing and verifying all field dimensions prior to installation of work for its scope. If existing work is out of agreed tolerances, Contractor is to immediately notify Construction Manager and applicable Contractor of the issue in writing.
16. Each Contractor shall provide all layout for their scope of work.
17. Installation schedule will conform to the mutually agreed upon construction schedule and sequence.
18. Contractor personnel shall be fully qualified to perform the work contained in their scope package.
19. Sufficient quantities of labor and resources shall be present at all times so as not to delay completion of the work. The cost of Overtime required for work over and above a typical 40-hour week, if required by Contractor to maintain their schedule, is the Contractor's responsibility.
20. Contractor shall submit safety manual to DCI's Project Manager before commencement of work. Contractor is responsible to submit above safety materials in advance of scheduled start date to avoid project schedule delays.
21. It shall be the responsibility of each company contemplating the submission of a quote for the proposed Contract to fully acquaint himself/herself with conditions at the work site, project requirements, and to become acquainted thoroughly with the work, and all conditions that may be related to it. No considerations or revision in the contract price or scope of the project will be considered by the Owner for any item that could have been revealed by a thorough on-site inspection and examination.
22. Contractor shall comply with all OSHA related safety requirements for the project.
23. Each Contractor is responsible for dust control during their work.
24. Award is expected November 29th, and contract execution December 13th.

Exhibit C Facility Work Requirements

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

WORK HOUR RESTRICTIONS

A. Work hours are from 8:00 AM to 5:00 PM, Monday through Friday unless arrangements are made in advance.

CONTRACTOR USE OF SITE AND PREMISES

B. Construction Operations: Limited to areas noted on Drawings.
C. Provide access to and from site as required by law and Owner:
    1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
    2. Do not obstruct roadways, sidewalks, or other public ways without permission of Owner and permit if required.
D. Facility will be occupied at all times during the duration of the project. Contractor personnel shall conduct themselves in an agreeable manner at all times. Failure to do so may result in removal from the work site.

OWNER OCCUPANCY

E. Owner intends to occupy the Project upon Substantial Completion.
F. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
G. Schedule the Work to accommodate Owner occupancy.

RULES FOR CONSTRUCTION WORKERS

H. The staff of the State of Iowa has a responsibility to protect the public by providing a secure environment. All work site rules must be followed to the letter, at all times.
I. Hot Work Permit Processes and Fire Watch, when necessary, will be adhered to for this project.
J. All State properties are tobacco free. No smoking will be permitted or tolerated on campus unless in designated areas.
K. You are permitted access only to the work site and no other area of the institution.
L. No drugs, alcohol, or firearms are allowed on the work site.
M. Do not leave money, drugs, alcohol, or firearms in your personal vehicle.
N. Company and personal vehicles are to be parked and locked in designated or area of the work.
O. Secure all tools at the end of the day.
P. Maintain control of all tools, supplies, and debris at all times during the work.
Q. Secure all tools at the end of each day. Never leave tools unattended.
R. During an emergency, follow the instructions of the security staff.

Exhibit D Technical Specifications

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

SECTION 024119
SELECTIVE STRUCTURE DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Related Documents:
   1. Drawings and general provisions of the Contract apply to this Section.
   2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Related Sections:
   1. Division 01 Section "Submittal Procedures."
   2. Division 01 Section "Construction Waste Management".

1.02 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures."

B. Shop Drawings: Indicate removal sequence and location of salvageable items.

C. Project Record Documents: Accurately record locations of capped utilities.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with requirements of applicable codes, rules and regulations.
   2. Do not close or obstruct roadways or sidewalks without permits.
   3. Maintain building and room egress and access at all times. Do not reduce required egress width to exits.
   4. Minimize interference with corridors, exits, sidewalks, roadways and public thoroughfares.
   5. Comply with applicable procedures if hazardous or contaminated materials are discovered or suspected.

B. Hazardous Materials Remediation Work:
   1. Perform lead and asbestos work in accordance with requirements of local, state, and Federal regulations for lead and asbestos in construction, including but not limited to Title 8 CCR 1529 and Title 8 CCR 1532.1, and 29 CFR 1926.1101 and 29 CFR 1926.62.

1.04 PROJECT CONDITIONS

A. Protect adjacent work to remain, and items to be turned over to Department of Corrections, from damage.

B. Existing Conditions:
   1. If lead, asbestos or other hazardous materials are found or suspected, immediately stop work in the suspected area and advise the Owner and Architect. Do not recommence work in the area until advised by the Owner that the area has been cleared for work.

C. Owner will occupy adjacent areas during the course of the Work. Work under this Section shall not affect Owner's operation of adjacent areas.

1.05 SEQUENCING

A. Submit schedule indicating proposed sequence of operations for selective demolition work to Owner for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services, and details for dust and noise control.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's operations.
2. Coordinate the scheduling of work of Section with the work of other sections.

PART 2 NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect and verify the existing conditions and become familiar with the extent of the Work.

B. Examine the site to determine proper access within the limitations of the Contract. Conduct operations so as not to interfere with adjacent roads, driveways, walks, buildings, corridors, means of access and egress, and work areas.

3.02 PREPARATION

A. Interfaces With Other Work: Coordinate extent of selective demolition work with limits of existing work to remain, and with demolition and modification requirements shown on the Drawings.

B. Protection:
1. Protect existing materials, appurtenances and equipment which are not to be demolished. Existing materials, appurtenances and equipment, building exterior and interior, and landscaping altered or damaged during demolition work shall be repaired or replaced by the Subcontractor to match existing undisturbed conditions at no additional cost to the Owner.
2. Prevent movement of structure; provide bracing and shoring as required.
3. Provide proper and permanent support to adjacent structure for all piping, conduits and cables to remain.
4. Provide and maintain temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage, or wind damage occurs to structure or interior areas of existing building.
5. Provide and maintain temporary barriers and security devices at doorways.
6. Use periodic light water mist, temporary enclosures, and other suitable methods to limit dust and dirt. Comply with applicable environmental protection regulations.
7. Provide and maintain temporary partitions to prevent spread of dust, odors and noise to permit continued Owner occupancy.
8. Maintain path of travel for debris removal dust free and clean at all times.
9. Maintain ventilation system dust free at all times.
10. Cover and protect windows and walls that are adjacent to areas to be demolished.
11. Protect smoke alarms and fire sprinklers from dust intrusion.
12. Maintain parking areas, driveways, exterior walkways, exit paths, and landscaping in a clean, undisturbed condition. Any debris caused by selective demolition work shall be removed each day.

C. Field verify the exact location of existing concealed utilities. Use caution if working in or about concealed or exposed utilities.
1. Disconnect, remove, and cap designated utility lines within demolition areas. Mark locations of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.

3.03 EXECUTION

A. Minimize interference with adjacent occupied building areas, materials and equipment.

B. Remove items in an orderly and careful manner.
   1. Remove only as much material as is required for new construction work to be conveniently performed.
   2. Cut surfaces so as to minimize the amount of new surfaces required to match existing. Make cuts plumb, true, level and straight, or as otherwise required to provide proper surfaces to receive new work and repairs.
   3. Cut asphalt and concrete by power saw in neat, sharp straight lines. Repair broken edges or as directed by the Owner.

C. Remove miscellaneous abandoned appurtenances that will be exposed to view, unless indicated otherwise.

D. Investigate and measure the nature and extent of unanticipated items that conflict with intended function or design. Submit written report with accurate detailed information to the Owner and Architect. While awaiting instructions from the Owner, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

E. Eliminate dust. Install dust barriers as required to keep dust out of corridors and adjacent areas. Use walkoff mats designed to remove dust at the corridor side of doors to rooms where demolition work is being done.
   1. Activities which generate silica dust, such as concrete saw cutting, jackhammering, chipping, or abrasive blasting, shall incorporate engineering controls to eliminate visible emissions.
   2. Do not use silica sand or other substances containing more than 1 per cent crystalline silica as abrasive blasting material
   3. Use concrete and masonry saws that provide water to the blade.
   4. Prevent human exposure to dust using methods such as removing dust with water, high efficiency particulate air (HEPA) filters, and wet sweeping. Do not use compressed air or dry sweeping.

F. Stop work and notify the Owner immediately if structure or other items to remain appear to be endangered. Do not resume work until directed by the Owner.

G. Do not disrupt service to existing fire sprinkler lines. If disruption becomes necessary, coordinate with the Owner..

H. Remove, store and protect materials to be re-installed or retained so as to prevent damage.

I. Remove and promptly dispose of vermin infested materials.

3.04 DISPOSAL AND CLEANUP

A. Material removed under this Contract which is not to be salvaged or reused in the Project shall become the property of the Contractor and shall be promptly removed from the job site. Do not store or permit debris to accumulate at the site.

B. Unless indicated otherwise, remove demolished material from site in a timely manner. Dispose of materials legally off site. Do not burn or bury materials on site.

C. Upon completion, clean the entire area of demolition residue satisfactory for the continuation of the Work. Remove temporary work.

3.05 SCHEDULES

A. Remove the following materials from the site and dispose of legally.
   1. Demolition materials.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.

B. Non-structural dimension lumber framing.

C. Miscellaneous framing and sheathing.

D. Concealed wood blocking, nailers, and supports.

E. Miscellaneous wood nailers, furring, and grounds.

1.02 REFERENCE STANDARDS

A. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing 2018a.

B. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials 2013.

C. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies 2018.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

E. ICC-ES AC310 - Acceptance Criteria for Water-resistive Membranes Factory-bonded to Wood-based Structural Sheathing, Used as Water-Resistive Barriers 2008, with Editorial Revision (2015).

F. PS 1 - Structural Plywood 2009.

G. PS 2 - Performance Standard for Wood-Based Structural-Use Panels 2010.

H. PS 20 - American Softwood Lumber Standard 2015.

1.03 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures: for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing, wood preservative materials and application instructions.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

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.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.

2. 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.
3. 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.
4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSIONAL LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes

B. Moisture Content: S-dry or MC19.

2.03 EXPOSED DIMENSIONAL LUMBER

A. Sizes: Nominal sizes

B. Surfacing: S4S.

C. Moisture Content: S-dry or MC19.

2.04 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimensional lumber and timbers.

B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.

2.05 CONSTRUCTION PANELS

A. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing.
   1. Bond Classification: Exterior.
   2. Span Rating: 48/24.

2.06 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. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.

B. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

C. All roof sheathing shall have H-clips installed at unblocked panel seams.

PART 3 - EXECUTION

3.01 PREPARATION

A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.

B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

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

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. Nail panels to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws or staples.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.08 CLEANING

A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 062000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood door frames, glazed frames.

B. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 081416 - Flush Wood Doors.

1.03 REFERENCE STANDARDS

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

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; stained finish to match existing.

2.02 LUMBER MATERIALS

A. Softwood Lumber: pine species, flat sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.03 FASTENINGS

A. Fasteners: Of size and type to suit application; natural finish in concealed locations and painted finish in exposed locations.

2.04 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of pine or DFL species.

B. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 SITE FINISHING MATERIALS

A. Stain, Shellac, Varnish, and Finishing Materials: Comply with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.06 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.07 SHOP FINISHING

A. Apply wood filler in exposed nail and screw indentations.

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

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

END OF SECTION

SECTION 079200
JOINT SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section covers interior and exterior sealant and their application, wherever required for complete installation of building materials or systems.

B. Section 08 8000 - Glazing

1.02 QUALITY ASSURANCE:

A. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.

1.03 CERTIFICATION:

A. Contractor is to submit to the Construction Manager written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vapor tight seals (as applicable), and that materials supplied meet specified performance requirements.

1.04 SUBMITTALS:

A. Submit in accordance with Section 01 3300 - Submittal Procedures.

B. Contractor certification.

C. Manufacturer's installation instructions for each product used.

D. Cured samples of exposed sealants for each color.

E. Manufacturer's Literature and Data:
   1. Primers
   2. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

F. Manufacturer warranty.

1.05 PROJECT CONDITIONS:

A. Environmental Limitations:
   1. Do not proceed with installation of joint sealants under following conditions:
      a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).
      b. When joint substrates are wet.

B. Joint-Width Conditions:
   1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:
   1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.06 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.

B. Carefully handle and store to prevent inclusion of foreign materials.

C. Do not subject to sustained temperatures exceeding 32 degrees C (90 degrees F) or less than 5 degrees C (40 degrees F).

1.07 DEFINITIONS:

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Backing Rod: A type of sealant backing.

C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

E. Expansion Joint Filler: watertight primary seal in expansion joints.

1.08 WARRANTY:

A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".

B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the client. Submit manufacturer warranty.

1.09 APPLICABLE PUBLICATIONS:

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. ASTM International (ASTM):
1. Elastomeric Cellular Preformed Gasket and Sealing Material
2. Mineral Fiber Block and Board Thermal Insulation
3. Standard Terminology of Building Seals and Sealants
4. Test Method for Low-Temperature Flexibility of Latex Sealants after Artificial Weathering
5. Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
6. Use of Sealants in Acoustical Applications.
7. Elastomeric Joint Sealants.
8. Laboratories Engaged in Testing of Building Sealants
9. Standard Guide for Use of Joint Sealants.
10. Test Method for Staining of Porous Substrate by Joint Sealants
11. Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants
12. Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints
13. Test Methods for Cone Penetration of Lubricating Grease
14. Specification for Flexible Cellular Materials—Sponge or Expanded Rubber
15. Surface Burning Characteristics of Building Materials

C. Sealant, Waterproofing and Restoration Institute (SWRI).

D. The Professionals' Guide

E. Environmental Protection Agency (EPA):

1. National Volatile Organic Compound Emission Standards for Consumer and Commercial Products

PART 2 - PRODUCTS

2.01 SEALANTS:

A. Exterior Sealants:
   1. Vertical surfaces, provide non-staining ASTM C920, Type S or M, Grade NS, Class 25, Use NT.
   2. Horizontal surfaces, provide ASTM C920, Type S or M, Grade P, Class 25, Use T.
   3. Provide location(s) of exterior sealant as follows:
      a. Joints formed where frames and subsills of windows, doors, louvers, and vents adjoin masonry, or metal frames. Provide sealant at exterior surfaces of exterior wall Penetrations.
      b. Metal to metal.
      c. Wood to masonry.
      d. Voids where items penetrate exterior walls.
      e. Metal reglets, where flashing is inserted into masonry joints, and where flashing is penetrated by coping dowels.
      f. Concrete to concrete

B. Floor Joint Sealant:
   1. ASTM C920, Type S or M, Grade P, Class 25, Use T.
   2. Provide location(s) of floor joint sealant as follows.
      a. Seats of metal thresholds exterior doors.
      b. Control and expansion joints in floors, slabs, ceramic tile, and walkways.

C. Interior Sealants:
   1. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system are to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):
      a. Architectural Sealants: 250 g/L.
      b. Sealant Primers for Nonporous Substrates: 250 g/L.
      c. Sealant Primers for Porous Substrates: 775 g/L.
   2. Vertical and Horizontal Surfaces: ASTM C920, Type S or M, Grade NS, Class 25, Use NT.
   3. Provide location(s) of interior sealant as follows:
      a. Typical narrow joint 6 mm, (1/4 inch) or less at walls and adjacent components.
      b. Perimeter of doors, windows, access panels which adjoin concrete or masonry surfaces.
      c. Interior surfaces of exterior wall penetrations.
      d. Joints at concrete walls and columns, piers, concrete walls or exterior walls.
      e. Exposed isolation joints at top of full height walls.
      f. Joints formed between tile floors and tile base cove; joints between tile and dissimilar materials; joints occurring where substrates change.

2.02 COLOR:

A. Sealants used with exposed masonry are to match color of mortar joints.

B. Sealants used with unpainted concrete are to match color of adjacent concrete.

C. Color of sealants for other locations to be light gray or aluminum, unless otherwise indicated in construction documents.

2.03 JOINT SEALANT BACKING:

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
   1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056 or synthetic rubber (ASTM C509), nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 degrees C (minus 26 degrees F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.04 FILLER:

A. Mineral fiberboard: ASTM C612, Class 1.

B. Thickness same as joint width.

C. Depth to fill void completely behind back-up rod unless otherwise shown in drawings.

2.05 EXPANSION JOINT FILLER

A. Colorseal/Seismic Colorseal : https://www.emseal.com/product/seismic-colorseal-wall-expansion-joint-3/

B. Color to match adjact materials

2.06 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.

B. Stain free type.

2.07 CLEANERS-NON POROUS SURFACES:

A. Chemical cleaners compatible with sealant and acceptable to manufacturer of sealants and sealant backing material. Cleaners to be free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.01 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.

B. Coordinate for repair and resolution of unsound substrate materials.

C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.02 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals' Guide).

B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
   1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
   2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
      a. Concrete.
      b. Masonry.
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include but are not limited to the following:
      a. Metal.
      b. Glass.

C. Do not cut or damage joint edges.

D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
   1. Apply primer prior to installation of back-up rod or bond breaker tape.
   2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.03 BACKING INSTALLATION:

A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.

B. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of backing rod and sealants.

D. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.

E. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

3.04 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.05 INSTALLATION:

A. General:
1. Apply sealants and caulking only when ambient temperature is between
2. 5 degrees C and 38 degrees C (40 degrees and 100 degrees F).
3. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
4. Do not install sealant type listed by manufacture as not suitable for use in locations specified.
5. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
6. Avoid dropping or smearing compound on adjacent surfaces.
7. Fill joints solidly with compound and finish compound smooth.
8. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to “skin” over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.
9. Finish paving or floor joints flush unless joint is otherwise detailed.
10. Apply compounds with nozzle size to fit joint width.
11. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.
12. Replace sealant which is damaged during construction process.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.

C. Interior Sealants:
1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
2. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cutouts to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
3. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.06 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by manufacturer of the adjacent material or if not otherwise indicated by the caulking or sealant manufacturer.

B. Leave adjacent surfaces in a clean and unstained condition.

END OF SECTION

SECTION 081416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

A. Section 062000 - Finish Carpentry: Wood door frames.

B. Section 081113 - Hollow Metal Doors and Frames.

C. Section 087100 - Door Hardware.

1.03 REFERENCE STANDARDS

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

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

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

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Samples: Submit two samples of door veneer, 4 by 4 inches (___ by ___ mm) in size illustrating wood grain, stain color, and sheen.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

PART 2 PRODUCTS

2.01 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.

2.02 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.03 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Natural birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Any option allowed by quality standard for grade.

2.04 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

E. Provide edge clearances in accordance with the quality standard specified.

2.05 FINISHES - WOOD VENEER DOORS

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

2.06 ACCESSORIES

A. Wood Door Frames: See Section 062000.

B. Door Hardware: See Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 085113
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extruded aluminum windows with fixed sash where noted on plan.

B. Factory glazing.

1.02 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

C. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2021.

D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

E. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

I. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

K. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017 (Reapproved 2023).

1.03 SUBMITTALS

A. See Section 01 3300 Administrative Requirements for submittal procedures.

B. Product Data: Include component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, anchorage locations, and installation requirements.

D. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification.

2. Evidence of WDMA Certification.
3. Evidence of CSA Certification.
4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

E. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

1.04 MOCK-UPS

A. Install one window with manufacturer's field representative in attendance. Design professional to review installation prior to completing full removal and installation. Mockup may remain in place provided installation is acceptable.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.06 WARRANTY

A. See Section 01 7700 Closeout Submittals for additional warranty requirements.

B. Correct defective work within a one year period after Date of Substantial Completion.

C. Manufacturer Warranty: Provide 10-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with manufacturer.

D. Manufacturer Warranty: Provide 10-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Quaker CityVu (C600).

B. Other Acceptable - Aluminum Windows Manufacturers:
1. Quaker Window Products Company; www.quakercommercialwindows.com/#sle.
2. Substitutions: Architect pre-approved equivalent.

2.02 ALUMINUM WINDOWS

A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
1. Frame Depth: 4.125" inch (___ mm).
2. Provide factory-glazed units.
3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.

4. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
5. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Fixed, Non-Operable Type:
1. Construction: Thermally broken.
2. Glazing: Double; clear; laminated security glazing
3. Exterior Finish: High performance organic coatings.
4. Interior Finish: High performance organic coatings.

2.03 PERFORMANCE REQUIREMENTS

A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
1. Performance Class (PC): AW.

B. Design Pressure (DP): In accordance with applicable codes.

C. Member Deflection: Limit member deflection to 1/175 in any direction, with full recovery of glazing materials.

D. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 psf (580 Pa).

E. Air Leakage: 0.1 cfm/sq ft (0.5 L/sec sq m) maximum leakage per unit area of outside window frame dimension when tested at 1.57 psf (75 Pa) pressure difference in accordance with ASTM E283/E283M.

F. Overall Thermal Transmittance (U-value): 0.35, maximum, including glazing, measured on window sizes required for this project.

G. Forced Entry Resistance: Tested to comply with ASTM F588 requirements for performance level of Grade 10 for specific window style required.

2.04 COMPONENTS

A. Frames; thermally broken with interior portion of frame insulated from exterior portion;flush glass stops of snap-on type.

B. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

C. Spray Polyurethane Foam for Perimeter Airsealing: Low Expanding Type
1. Basis of design: DuPont Great Stuff Pro Window and Door Sealant
2. Substitutions: Architect pre-approved equal.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

2.06 FINISHES

A. High Performance Organic Coatings: AAMA 2604; multiple-coat, thermally-cured fluoropolymer system.

B. Fluoroethylene Vinyl Ether (FEVE) Coating: Superior performing resin based organic powder coatings system complying with AAMA 2605; single coat applications when applied to

aluminum with dry film thickness (DFT) of 2 to 3 mil, 0.002 to 0.003 inch (0.051 to 0.076 mm); color and gloss as scheduled.

1. Apply coating to exposed metal surfaces with proper preparation and pretreatment in accordance with resin manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings and adjoining water-resistive barrier materials are ready to receive aluminum windows; see Section 072500.

3.02 PRIME WINDOW INSTALLATION

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

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sill and sill end angles.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Install low expanding spray foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.

B. Owner may provide field testing of installed aluminum windows by AAMA accredited independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.

C. If defects are noted, repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements at contractors expense.

3.04 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.05 CLEANING

A. Remove protective material from factory finished aluminum surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

SECTION 087100
DOOR HARDWARE

DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood doors.

1.02 RELATED REQUIREMENTS

A. Section 062000 - Finish Carpentry: Wood door frames.

B. Section 079200 - Joint Sealants: Sealants for setting exterior door thresholds.

C. Section 081416 - Flush Wood Doors.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. BHMA A156.1 - Standard for Butts and Hinges; 2021.

C. BHMA A156.2 - Bored and Preassembled Locks and Latches; 2022.

D. BHMA A156.3 - Exit Devices; 2020.

E. BHMA A156.4 - Door Closers and Pivots; 2024.

F. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.

G. BHMA A156.8 - Door Controls - Overhead Stops and Holders; 2021.

H. BHMA A156.16 - Standard for Auxiliary Hardware; 2023.

I. BHMA A156.17 - Self Closing Hinges & Pivots; 2019.

J. BHMA A156.18 - Standard for Materials and Finishes; 2020.

K. BHMA A156.21 - Thresholds; 2019.

L. BHMA A156.26 - Standard for Continuous Hinges; 2021.

M. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.

N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

1.05 SUBMITTALS

A. See Section 01 3300- Submittal Procedures, 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, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Comply with DHI (H&S) using door numbers and hardware set numbers as indicated in construction documents.
   2. List groups and suffixes in proper sequence.
   3. Provide complete description for each door listed.

D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
   2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
   3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Keying Schedule:
   1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

G. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Lock Cylinders: Ten for each master keyed group.
   3. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 DELIVERY, STORAGE, AND HANDLING

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

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
   1. Closers: Five years, minimum.
   2. Exit Devices: Three years, minimum.
   3. Locksets and Cylinders: Three years, minimum.
   4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
   1. Applicable provisions of federal, state, and local codes.
   2. Accessibility: ADA Standards and ICC A117.1.

D. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's series. Refer to Door Hardware Schedule.

E. Fasteners:
   1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
      a. Aluminum fasteners are not permitted.
      b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
   2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
      a. Self-drilling (Tek) type screws are not permitted.

2.02 HINGES

A. Hinges: Comply with BHMA A156.1, Grade 1.
   1. Self Closing Hinges: Comply with BHMA A156.17.
   2. Continuous Hinges: Comply with BHMA A156.26.
   3. Provide hinges on every swinging door.
   4. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   5. Provide ball-bearing hinges at each door with closer.
   6. Provide following quantity of butt hinges for each door:
      a. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.

2.03 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
   1. Provide standard, conventional, and full size interchangeable core (FSIC) type cylinders, Grade 1, with six-pin core in compliance with BHMA A156.5 at locations indicated.
   2. Provide cylinders from same manufacturer as locking device.
   3. Provide cams and/or tailpieces as required for locking devices.

2.04 CYLINDRICAL LOCKS

A. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
   1. Bored Hole: 2-1/8 inch (54 mm) diameter.
   2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
   3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
   4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
      a. Finish: To match lock or latch.
   5. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.

2.05 CLOSERS

A. Closers: Comply with BHMA A156.4, Grade 1.
   1. Type: Surface mounted to door.
   2. Provide door closer on each exterior door.
   3. At corridor entry doors, mount closer on room side of door.
   4. At outswinging exterior doors, mount closer on interior side of door.

2.06 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders (Door Checks): Comply with BHMA A156.8, Grade 1.
   1. Provide stop for every swinging door, unless otherwise indicated.

2.07 KICK PLATES

A. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront and glass entry doors, unless otherwise indicated.
   1. Size: 8 inch (203 mm) high by 2 inch (51 mm) less door width (LDW) on push side of door.

2.08 FLOOR STOPS

A. Floor Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   1. Type: Manual hold-open, with pencil floor stop.
   2. Material: Aluminum housing with rubber insert.

2.09 WALL STOPS

A. Wall Stops: Comply with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
   1. Type: Bumper, concave, wall stop.
   2. Material: Aluminum housing with rubber insert.
   3. Provide Wall Stops where Floor Stops are not feasible

2.10 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
   1. Primary Finish: 625; bright chromium plated over nickel, with brass or bronze base material (former US equivalent US26); BHMA A156.18.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify that electric power is available to power operated devices and of 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 application of finishes to substrate are fully completed.

D. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
   1. Mounting heights in compliance with ADA Standards:
      a. Locksets: 40-5/16 inch (1024 mm).
      b. Push Plates/Pull Bars: 42 inch (1067 mm).
      c. Deadlocks (Deadbolts): 48 inch (1219 mm).
      d. Exit Devices: 40-5/16 inch (1024 mm).

E. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING

A. Adjust hardware for smooth operation.

B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

3.06 DOOR HARDWARE SCHEDULE

A. **SET #01 - Interior Wood Doors - Privacy Lockset**
   1. Doors: D03
   2. 3 HW Hinges FBB168 4 1/2 X 4 1/2 NRP
   3. 1 Mortise Privacy Lock with Occupancy Indicator
   4. 3 Silencers
   5. 1 Floor Stop

B. **SET #02 - Interior Wood Doors - Storeroom Lockset**
   1. Doors: D04
   2. 3 HW Hinges FBB168 4 1/2 X 4 1/2 NRP
   3. 1 Mortise Storeroom Lock
   4. 1 Overhead Closer
   5. 3 Silencers
   6. 1 Floor Stop

END OF SECTION

SECTION 090561
SUBSTRATE PREPARATION FOR FLOORING INSTALLATION- USG

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of existing floor coverings.

B. Preparation of existing concrete floor slabs for installation of floor coverings.

C. Patching compound.

1.02 RELATED REQUIREMENTS

A. Section 096700 - Fluid-Applied Flooring for additional substrate preparation requirements.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2023.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Suitable for conditions, and compatible with adhesive and floor covering.
   1. Chemically hardening compound specifically designed to bond to gypsum-based underlayment and suitable for use over interior wood and concrete subfloors.
   2. Mildew-, and alkali-resistant compound capable of being feathered to nothing at edges.
   3. Compressive Strength: 3.000 psi (20.7 MPa), minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
   4. Products:

PART 3 EXECUTION

3.01 SEQUENCE OF PROCEDURES

A. Patching, smoothing, and leveling of substrates, as required.

B. Other preparation specified.

C. Adhesive bond and compatibility test performed by affected flooring installer.

D. Protection.

3.02 APPLICATION OF PATCHING COMPOUND

A. Comply with manufacturer's written instructions and recommendations.

B. Ensure substrate surfaces are dry, clean, and free of contaminants that might prevent proper bonding.

C. Site mix materials in accordance with manufacturer's instructions and at recommended ratios.

D. Concrete Substrates:
   1. Prepare surfaces by shot-blasting, scarification, or grinding if recommended by patching compound manufacturer.
   2. Do not apply when the moisture content in the concrete/mortar bed substrate exceeds 5.0 lbs/1,000 sq ft/24 hours (282.55 µg/(s sq m)) when measured in accordance with ASTM F1869 or 80 percent relative humidity as measured by moisture probes.
   3. Fill substrate cracks, cold joints, control joints with materials recommended by manufacturer.
   4. Patch or skim-coat spalling, pitting, or chipping in concrete surfaces.

E. Gypsum Underlayment Substrates:
   1. Seal underlayment with primer or sealer recommended by patching compound manufacturer.

3.03 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 092900
GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Related Documents:
   1. Drawings and general provisions of the Subcontract apply to this Section.
   2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:
   1. Gypsum board, including joint treatment.

1.02 REFERENCES

A. General:
   1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
   2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
   3. Refer to Division 01 Section "Quality Requirements" for the list of applicable regulatory requirements.

B. ASTM International:
   1. Standard Specification for Gypsum Wallboard.
   2. Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board.
   3. Standard Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
   4. Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
   5. Standard Specification for Water-Resistant Gypsum Backing Board.
   6. Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   7. Standard Specification for Application and Finishing of Gypsum Board.
   8. Standard Practice for Use of Sealants in Acoustical Applications.
   9. Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

C. GA – Gypsum Association:
   1. GA-214 - Recommended Levels of Gypsum Board Finish, published by the Gypsum Association (GA).
   2. GA-600 - Fire Resistance Design Manual.

D. Underwriters Laboratories, Inc (UL) Fire Resistance Directory.

1.03 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures."

B. Product Data: Manufacturer’s product data and installation instructions for each component.

1.04 QUALITY ASSURANCE

A. Fire-Rated Assemblies: UL, GA-600

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

1.05 DELIVERY AND STORAGE

A. Deliver materials in original unopened packages, containers or bundles bearing manufacturer's name, and product name and number.

B. Store materials in compliance with manufacturer's recommendations, and in an enclosed ventilated shelter providing protection from the elements. Store flat and off floor.

C. Remove damaged or deteriorated materials and replace with new at no additional cost to COUNTY.

1.06 PROJECT CONDITIONS

A. Do not commence installation of gypsum products until the building has been closed in, or exterior openings are otherwise protected.

B. Maintain areas to receive gypsum board at temperature recommended by manufacturer.

PART 1 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: United States Gypsum Company, National Gypsum Company, or G-P Gypsum Corporation or architect pre-approved equivalent.

B. All materials included in this Section shall be the products of one manufacturer, unless noted otherwise.

2.02 MATERIALS

A. Gypsum Board Materials: Maximum permissible lengths, Type X, fire rated, ends square cut, tapered edges on boards to be finished, unless otherwise indicated.
   1. Gypsum Board: ASTM C36, 5/8" thick.
   2. Gypsum Sheathing Board: ASTM C79, moisture resistant board, 5/8" thick, tongue and groove edges. (Greenboard)

B. Accessories:
   1. Fasteners: Metal screws meeting ASTM C1002, minimum S-12 screws for 20 gage or heavier metal.
   2. Trim: Coated steel, designed to be concealed in finished construction by tape and joint compound.
      a. Edge Trim: GA-216 "L", "LK" of "LC".
      b. Corner Beads: Manufacturer's standard metal bead.
      c. Control Joints: Manufacturer's standard metal with removable strip
      d. Aluminum Moldings: Fry Corp., or equal, extruded aluminum, profiles indicated on Drawings, natural finish, longest lengths possible to minimize joints.
      e. Joint Materials: Reinforcing tape, joint compound, adhesive, water: ASTM C475.

PART 1 EXECUTION

3.01 EXAMINATION

A. Coordinate with other trades for provisions for insulation, refractory fiber, blocking, metal backing plates, special anchors, access doors and panels, and ensure that such items are

properly located and installed prior to installing wall finish.

B. Inspect surfaces, backing, framing and furring systems to receive gypsum board, and report any discrepancies. Starting work implies acceptance of existing conditions.

3.02 PREPARATION

A. Protect adjacent areas and air distribution systems from gypsum dust.

3.03 INSTALLATION

A. Gypsum Board: Install in accordance with ASTM C840 and manufacturer's recommendations.
   1. Fasten gypsum board with screws.
   2. Install gypsum board plumb, level, and plane.
   3. Erect gypsum board with edges and ends occurring on framing members, except edges and ends that are perpendicular to framing members.
   4. Locate joints on opposite sides on different studs. Joints are not permitted at corners of openings unless detailed otherwise.
   5. Tolerances: Maximum variation of finished surface from true flatness 1/8 inch in 10 feet (3 mm in 3m).
   6. Finish: Comply with GA-214.
      a. Level 4: Smooth finish. Where flat paints or light wall coverings are indicated.

B. Accessories:
   1. Control Joints: Place consistent with lines of building spaces and as directed by Project Manager. Provide at the following conditions:
      a. Where system abuts structural elements.
      b. At dissimilar materials.
      c. Partitions exceeding 30 feet (9.15 m) lengths.
      d. Ceilings exceeding 50 feet (15.24 m) or 2,500 square feet (232.25 m²).
      e. Wings of "L", "T" or "U" shaped ceilings.
   2. Corner Beads: Place at external corners; use longest practical lengths.
   3. Edge Trim: Place where gypsum board abuts dissimilar materials.
   4. Tape, fill and sand exposed joints, edges, corners and openings to produce surface ready to receive finishes. Feather coats onto adjoining surfaces.

C. Remove and replace defective work.

D. Protect gypsum board work from moisture and contaminants.

GYPSUM BOARD LOCATION SCHEDULE

1. Greenboard – Restroom Interior
2. Type X – All other locations

END OF SECTION

SECTION 096513
RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Resilient base (RB) adhered to interior walls and partitions.

1.02 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):
   1. F1861-08(2012)e1 - Resilient Wall Base.
   2. D4259-88(2012) - Abrading Concrete.

C. International Concrete Repair Institute (ICRI):
   1. R-13 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

1.03 SUBMITTALS

A. Submittal Procedures: Section 01 3300 - Submittal Procedures

B. Manufacturer's Literature and Data:
   1. Description of each product.
   2. Adhesives and primers indicating manufacturer's recommendation for each application.
   3. Installation instructions.

C. Samples:
   1. Resilient Base: 150 mm (6 inches) long, each type and color.

D. Operation and Maintenance Data:
   1. Care instructions for each exposed finish product.

1.04 DELIVERY

A. Deliver products in manufacturer's original sealed packaging.

B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.

C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.05 STORAGE AND HANDLING

A. Store products indoors in dry, weathertight facility.

B. Protect products from damage when handling and during construction operations.

1.06 FIELD CONDITIONS

A. Environment:
   1. Product Temperature: Minimum 21 degrees C (70 degrees F) for minimum 48 hours before installation.
   2. Work Area Ambient Temperature Range: 21 to 27 degrees C (70 to 80 degrees F) continuously, beginning 48 hours before installation.

3. Install products when building is permanently enclosed and when wet construction is completed, dried, and cured.

1.07 WARRANTY

A. Construction Warranty: Per Iowa Statute.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Basis of Design: Roppe Thermoplastic Vinyl (TV) Wall Base or approved equal.

B. Provide each product from one manufacturer and from one production run.

2.02 RESILIENT BASE

A. Resilient Base: 3 mm (1/8 inch) thick, 100 mm (4 inches) high.
   1. Type: Rubber or vinyl; use one type throughout.
   2. ASTM F1861, Type TP thermoplastic rubber or Type TV thermoplastic vinyl, Group 2 - layered.

B. Applications:
   1. All Locations: Style B - Cove.

2.03 ADHESIVES

A. Adhesives: Low pollutant-emitting, water based type recommended by adhered product manufacturer for each application.

PART 3 EXECUTION

3.01 PREPARATION

A. Examine and verify substrate suitability for product installation.

B. Protect existing construction and completed work from damage.

C. Remove existing base to permit new installation.
   1. Dispose of removed materials.

D. Correct substrate deficiencies.
   1. Fill cracks, pits, and depressions with leveling compound.
   2. Remove protrusions; grind high spots.
   3. Apply leveling compound to achieve 3 mm (1/8 inch) in 3 m (10 feet) maximum surface variation.

E. Clean substrates. Remove contaminants capable of affecting subsequently installed product's performance.
   1. Mechanically clean concrete floor substrate according to ASTM D4259.
   2. Surface Profile: ICRI Guideline No. 310.2R.

F. Allow substrate to dry and cure.

G. Perform flooring manufacturer’s recommended bond, substrate moisture content, and pH tests.

3.02 INSTALLATION GENERAL

A. Install products according to manufacturer's instructions.
   1. When instructions deviate from specifications, submit proposed resolution for Contracting Officer consideration.

3.03 RESILIENT BASE INSTALLATION

A. Applications:
   1. Install resilient base in rooms scheduled on Drawings.
   2. Install resilient base on casework and other curb supported fixed equipment.
   3. Extend resilient base into closets, alcoves, and cabinet knee spaces, and around columns within scheduled room.

B. Lay out resilient base with minimum number of joints.
   1. Length: 600 mm (24 inches) minimum, each piece.
   2. Locate joints 150 mm (6 inches) minimum from corners and intersection of adjacent materials.

C. Installation:
   1. Apply adhesive uniformly for full contact between resilient base and substrate.
   2. Set resilient base with hairline butted joints aligned along top edge.
   3. Joint Sealant – Set cove base in full bed silicone sealant in foodservice area. Apply sealant to top joint to CMU wall and base to concrete floor.

D. Factory form corners and end stops.
   1. V-groove back of outside corner.
   2. V-groove face of inside corner and notch cove for miter joint.

E. Roll resilient base ensuring complete adhesion.

3.04 CLEANING

A. Remove excess adhesive before adhesive sets.

B. Clean exposed resilient base surfaces. Remove contaminants and stains.
   1. Clean with mild detergent. Leave surfaces free of detergent residue.

C. Polish exposed resilient base to gloss sheen or per manufacturer’s direction.

3.05 PROTECTION

A. Protect products from construction traffic and operations.
   1. Maintain protection until directed by Owner’s Representative.

B. Replace damaged products and re-clean.
   1. Damaged Products include cut, gouged, scraped, torn, and unbonded products.

END OF SECTION

SECTION 099100
PAINTING

PART 1 GENERAL

1.01 SUMMARY

A. Related Documents:
   1. Drawings and general provisions of the Subcontract apply to this Section.
   2. Review these documents for coordination with additional requirements and information that apply to work under this Section.
   3. Refer to other Sections for references to painting work included under this Section.

B. Section Includes:
   1. Field application of paints and coatings.
   2. Unless otherwise specified or shown, paint all surfaces and items which are exposed to view, including those out of doors or on roofs.
   3. Surface preparation.

C. Surfaces Not To Be Painted:
   1. Prefinished items, except prefinished items specified to be field painted in Article [3.03] [and] [3.09].
   2. Walls or ceilings of concealed or inaccessible areas.
   3. Fire or smoke rating labels on doors or frames.
   4. Equipment name plates.
   5. Heat detectors.
   6. Smoke detectors.
   7. Piping identification labels.
   8. Moving parts of mechanical or electrical equipment.

1.02 REFERENCES

A. General:
   1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
   2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
   3. Refer to Division 01 Section "Quality Requirements" for the list of applicable regulatory requirements.

1.03 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures."

B. Product Data:
   1. Materials List: Complete list of proposed manufacturers and products.
   2. Manufacturer's Specifications: Manufacturer’s technical information for each product, including paint analysis and application instructions.
   3. Material safety data sheets for each product.

C. Samples:
   1. Preliminary Samples: 8-1/2" x 11" samples of each color, texture and sheen on glossy card stock.

2. Color match samples to existing wall and trim colors.
3. Field Samples: After preliminary samples have been approved, apply minimum 30" x 30" field samples at locations designated by Project Manager for final approval.
   a. Do not prepare interior field samples until permanent lighting is in place and operating.
   b. Allow for applying field samples two additional times in order to achieve desired colors, without additional cost to District or delay in schedule.

D. Closeout Submittals:
1. Two copies of manufacturer's color and sheen formula, and 4" x 6" color chips, for each final color used in the Project.
2. Product Usage Records: Three copies of product usage records for each paint, coating and solvent product used in the project. Include product name, amount used, description of use and use location, and period of time over which the product was used.

1.04 QUALITY ASSURANCE

A. Manufacturer's Instructions: Perform painting work in accordance with manufacturer's written instructions and recommendations.

B. Pre-Installation Meeting: Before painting begins, meet with Project Manager, Architect and Subcontractor to discuss painting work, color schedule, product compliance, and hazardous material remediation.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the Project in original, new, unbroken packages and containers bearing manufacturer's name and label, with:
1. Name of material, color and sheen.
2. Manufacturer’s name, product number and date of manufacture.
3. Contents by volume of major pigments, vehicle constituents and volatile organic compound (VOC) content.
4. Thinning and application instructions.

1.06 PROJECT CONDITIONS

A. Comply with paint manufacturer's instructions on temperature and humidity conditions under which materials can be applied.

B. Environmental Requirements:
1. Silica Dust: Incorporate controls to eliminate visible emissions from any activity , which may generate silica dust, such as abrasive blasting.
   a. Do not use silica sand or other substances containing more than 1 per cent crystalline silica as abrasive blasting materials.
   b. Prevent exposure of workers and others to dust using methods such as removing dust with water, high efficiency particulate air (HEPA) filters, and wet sweeping. Do not use compressed air or dry sweeping to remove dust.
2. Contain and dispose of materials resulting from cleaning, including lead-containing materials, in accordance with District procedures and applicable regulations.
3. Disposal down District sanitary drains or storm drains of solvents, etching materials, or water contaminated with solvents or etching materials, is not permitted. Contain and dispose of such materials at legal disposal sites approved for this purpose.

1.07 MAINTENANCE STOCK

A. Provide 1 full gallon of each type and color of finish coats used on the Project. Label with paint manufacturer, paint type, product number, color, sheen and its representative use on the Project.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Benjamin Moore, Diamond Vogel, Sherwin Williams or Architect pre-approved equal.

2.02 MATERIALS

A. Material Quality:
   1. Provide premium quality materials. Materials not bearing manufacturer's identification as a premium-grade product are not acceptable.
   2. Should manufacturer's specifications or product numbers change, provide its current equal or better product.
   3. Primer and undercoats are to be of same manufacturer as final coat.
   4. Materials left from previous jobs are not acceptable.
   5. Use only thinners approved by paint manufacturer, and use only within recommended limits.
   6. Etching Solutions: As recommended by paint manufacturer for the use intended.
   7. Solvents: Non-petroleum based, as recommended by paint manufacturer for the use intended.
   8. Crack Filler: Elastomeric, approved by paint manufacturer for the particular use intended.

B. Finish Coat Coordination: Provide finish coats which are compatible with prime paints used.
   1. Review other Sections in which prime paints are provided. Ensure compatibility of total coating systems.
   2. Upon request from other trades, furnish information on characteristics of finish materials proposed for use.
   3. Provide barrier coats over incompatible primers, or remove and reprime.
   4. Notify Owner's Representative in writing of any problems anticipated in use of specified coating systems with substrates primed by others.

2.03 COLORS

A. General:
   1. Use of proprietary names in color selections does not imply exclusion of equivalent products of other manufacturers.
   2. The proposal and acceptance of any paint manufacturer shall not restrict Owner to selection of standard colors of that manufacturer.
   3. Color palette will consist of existing colors.

B. Finish coat colors shall be factory mixed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions under which painting work is to be applied.

B. Do not paint over dirt, rust, scale, grease, oil, dust, moisture, scuffed or damaged surfaces, or conditions detrimental to a durable paint life.

C. Starting work indicates acceptance of conditions of surfaces and within any particular area.

3.02 PREPARATION

A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified for substrate condition.

B. Remove hardware, accessories, and items in place and not to be painted, or provide protection prior to surface preparation and painting. Reinstall removed items after painting.

C. Clean surfaces before applying paint. Remove oil and grease prior to mechanical cleaning. Schedule cleaning so contaminants from cleaning process do not fall onto wet, newly painted surfaces.

D. Moisture Content: Do not paint over surfaces where moisture content exceeds manufacturer's instructions.

E. Ferrous Metals:
   1. Bare Surfaces: Clean of oil, dirt, loose mill scale, and other foreign substances with solvent or by mechanical cleaning.
   2. Shop Applied Primer: Touch up where damaged or bare using same type of primer as adjacent surfaces.
   3. Galvanized Surfaces: Clean free of oil and surface contaminants using etching solution, and rinse with water to neutralize

F. Non-Ferrous Metals: Remove contaminants with water, detergent or solvents. Allow metal to dry, then abrade to remove surface oxides.

G. Gypsum Board: Remove dust, and repair surface imperfections. Spot-prime defects after repair.

H. Mix painting materials in accordance with manufacturer's instructions.

I. Store materials in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
   1. Cover containers of coatings or solvents when not in use.

J. Stir materials before application to produce mixture of uniform density, and stir as required during application. Do not stir surface film into material, strain material before using if necessary.

3.03 APPLICATION

A. Apply paint in accordance with manufacturer's instructions. Use applicators and techniques best suited for substrate and type of material being applied.
   1. Apply additional coats when stains or blemishes show through final coat, until paint is a uniform finish, color and appearance.
   2. Ensure dry film thickness at corners and crevices is equivalent to that of flat surfaces.
   3. Sand lightly between each succeeding enamel or varnish coat.
   4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment and furniture with prime coat only.

5. Paint interior surfaces of ducts, where visible through registers or grilles, with black, non-specular flat paint.
6. Paint backs and sides of access panels and removable or hinged covers to match exposed surfaces.
7. Finish exterior doors on tops, bottoms and side edges same as exterior faces.
8. Paint door louvers, glass stops [and astragals] to match color of door faces.
9. Paint prime coated access panels, grilles, louvers, etc., same color as adjacent surfaces, or, if adjacent surface does not require painting, use color as directed.
10. Paint ducts and piping which are exposed in finished areas, or are out-of-doors including roofs, to match wall or ceiling color.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated or otherwise prepared for paint as soon as practicable after preparation.
1. Do not apply materials in areas where dust is being generated, or will be generated, before coatings are thoroughly dry.
2. Do not commence painting work in an area or space until all firestopping work in that area or space has been completed and inspected.
3. Allow time between successive coats to permit proper drying.
4. Do not recoat until paint feels firm and does not deform or feel sticky under moderate thumb pressure.

C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to achieve a total dry film thickness (DFT) as recommended by coating manufacturer.

D. Prime Coats: Apply to items not previously primed. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat. Prime all CMU surfaces with block filler primer.

E. Finish Coats: Provide even texture. Leave no laps, irregularity in texture, skid marks, or other surface imperfections.
1. Opaque Finishes: Provide opaque, uniform finish, color and coverage. Cloudiness, spotting, holidays, brush marks, runs, sags, ropiness or other surface imperfections are not acceptable.
2. Transparent Finishes: Provide glass smooth surface film of even luster. Cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections are not acceptable.

F. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not accepted.

3.04 FIELD QUALITY CONTROL

A. Owner may require materials testing procedures at any time during field painting.

B. If test results show material being used does not comply with requirements, Subcontractor may be directed to remove non-complying work, pay for testing, and repaint surfaces at no additional cost to owner.

3.05 CLEANING

A. Remove discarded paint materials, rubbish, cans and rags from site at end of each workday.
1. Keep flammable materials in approved labeled containers in a well-ventilated area.
2. Cover containers of coatings or solvent products when not in use.

B. Protection: Protect work of other trades, whether to be painted or not. Correct damage by cleaning, repairing, replacing, or repainting, as acceptable to Project Manager.
   1. Clean glass and paint-spattered surfaces immediately by proper methods of washing and scraping. Do not damage or scratch finished surfaces.
   2. Do not paint fire sprinkler heads, heat detectors, or smoke detectors. If painted by Subcontractor, remove and replace with new items at no additional cost District.
   3. Provide “Wet Paint” signs to protect new painted finishes.
   4. Remove temporary protective wrappings, provided by others for protection of their work, after completion of painting operations.
   5. Do not cover operating mechanical or electrical equipment.

C. Repair: At completion of work by other trades, touch up and restore damaged surfaces or defaced painted surfaces.

3.06 PAINT SCHEDULE - COATINGS

COATING SYSTEMS:

4.01 MASONRY, WOOD, PVC, GYPSUM BOARD:

A. Finish Coat:
   1. Dry Mils – As Noted
   2. Dry Mils – Per Manufacturer
      a. Low Luster:
         1) Dry Mils - As Noted
         2) Dry Mils 1.6
            (a) Voc 0 G/L
         3) Dry Mils 1.6
            (a) Voc 0 G/L
      b. Semigloss:
         1) Dry Mils - As Noted
         2) Dry Mils 1.4
            (a) Voc 0 G/L
         3) Dry Mils 1.4
            (a) Voc 0 G/L
   3. Follow manufacturer's recommendations for field painting PVC panel and trim.

END OF SECTION

SECTION 323123
PLASTIC FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Posts, rails, and frames.

B. Plastic pickets.

C. Plastic filler panels.

D. Manual gates with related hardware.

1.02 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on fence panels, posts, accessories, fittings and hardware.

C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.

PART 2 PRODUCTS

2.01 PLASTIC FENCES AND GATES

A. PVC Posts, Rails, and Pickets: High-impact, UV-resistant, rigid polyvinyl chloride, complying with ASTM D1784, Class 14344B.
   1. Fence Style: Full privacy.
      a. Fence Height: 3 feet (0.9 m).
      b. Color: As selected.
      c. Finish: Smooth.
   2. Line and Corner Posts: 5 by 5 inches (127 by 127 mm), minimum; 0.135-inch (3.4 mm) wall thickness, 3/8-inch (9.5 mm) corner radius.
   3. Rails: 1-1/2 by 5-1/2 inches (38 by 140 mm), minimum; 0.090-inch (2.3 mm) wall thickness, 5/16-inch (7.9 mm) corner radius.
   4. Top Accent Rails: 2 by 3-1/2 inches (51 by 89 mm), minimum; 0.120-inch (3 mm), 13/16-inch (21 mm) corner radius.
   5. Pickets: 5/8 by 11-3/8 inches (15.9 by 289 mm), minimum, tongue and groove; 0.050-inch (1.3 mm) wall thickness, 1/16-inch (1.6 mm) corner radius.
      a. Picket Spacing: Full privacy.
   6. Post Caps: Match cross section of post; 0.095-inch (2.4 mm) wall thickness, flat configuration.
   7. Stiffener Channels: ASTM A36/A36M, galvanized steel with predrilled holes for drainage; sized to fit within PVC rails.

B. Fasteners: Manufacturer's standard stainless steel fasteners.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install framework, pickets, fence panels, accessories and gates in accordance with manufacturer's instructions.

END OF SECTION

Exhibit E Sample Certification of Insurance

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

SAMPLE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): xx/xx/xxxx

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Agent's Name Agent's Address	CONTACT NAME: Agent's Information PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS:
INSURED Trade Contractor's Name Trade Contractor's Mailing Address	INSURER(S) AFFORDING COVERAGE / NAIC # INSURER A: Company A (AM Best Rated A/VI or Better) — Admitted Carriers INSURER B: INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS (Minimum)	
* A	COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC OTHER:	X	X	#TBD- CGL	3/1/17	3/1/18	EACH OCCURRENCE	$ 1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
							PRODUCTS - COMP/OP AGG	$ 1,000,000
								$
B	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [ ] HIRED AUTOS [ ] NON-OWNED AUTOS	X	X	#TBD-AL	3/1/17	3/1/18	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
C	UMBRELLA LIAB [X] OCCUR EXCESS LIAB [ ] CLAIMS-MADE DED [ ] RETENTION $	X	X	#TBD-UMB	3/1/17	3/1/18	EACH OCCURRENCE	$ 2,000,000
							AGGREGATE	$
								$
D	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) [ ] Y/N If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	X	#TBD-WC	3/1/17	3/1/18	[X] PER STATUTE [ ] OTH-ER	
							E.L. EACH ACCIDENT	$ 500,000
							E.L. DISEASE - EA EMPLOYEE	$ 500,000
							E.L. DISEASE - POLICY LIMIT	$ 500,000
* E	Owners Contrators Protective Liability			#TBD-OCP	3/1/17	3/1/18	*Limits equal to CGL (or) as required by owner (Note- Would be either CGL or OCP, not both)	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Additional Insured on a Primary & Non-Contributory basis (CGL;AL;UMB/Excess) in favor of : (Owner) Iowa Department of Administrative Services (DAS), Officers, Directors, Members, Consultants, Agents, and Employees.
Waiver of Subrogation (CGL;AL;WC/EL;UMB/Excess) in favor of: (Owner) Iowa Department of Administrative Services (DAS), Officers, Directors, Members, Consultants, Agents, and Employees.

Project XXXX.XX (Number varies by project)

CERTIFICATE HOLDER	CANCELLATION
Iowa Department of Administrative Services (DAS) 109 SE 13th Street Des Moines, IA 50319	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE Signature

Exhibit F General and Special Work Requirements

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

Due Tuesday, November 26, 2024, at 2:00PM (CT)

1.01 BIDDING

A. Trade Contractor shall include all applicable fees, permits, freight, hoisting, scaffolding, clean up, supervision, overhead, etc. to perform his work.
B. The owner will provide the general building permit only. All other permits required for completion of contractor's scope of work or by any governing body are the responsibility of said contractor.
C. Bidders to review ALL Bid Packages to fully understand the requirements of each package. Where two bid packages conflict, confirm with Construction Manager as to which package is to perform the work noted before bidding. After bidding, any conflict noted will be evaluated by the Construction Manager. The Construction Manager will then determine which package should perform the work and which package will credit the associated work's cost.
D. Where conditions conflict in the project manual or project drawings, contact the Construction Manager for clarification. When in doubt figure the more extensive requirement.
E. Each contractor is responsible for the identification of alternates and how they relate to each bid package. If a bid package is affected in ANY way by ANY of the alternates, an add/deduct should be noted on the bid form. If there is no change in cost write zero dollars.
F. The Contractor should visit the site of the Work to acquaint the firm with all local conditions affecting the Contract, including the structure of the ground, the obstacles which may be encountered, and all other conditions relative to the Work to be performed; and shall not be allowed any extra compensation by reason of any difficulties or obstacles which the Bidder could have discovered or reasonably anticipated prior to Bidding. Contractor shall review Instructions to Bidders for coordination of site visits.
G. On all project Drawings, figures take precedence over measurement by scale, and any scaling is done at the Contractor's own risk. The Design Professional shall decide on questions that may arise regarding the meaning and intent of the Project Drawings and Project Specifications. Should any details or figures have been omitted which are necessary to a clear understanding of the Work or should any error appear in either, or should discrepancies be found between the Project Drawings and Project Specifications, it shall be the duty of the Contractor to notify the Construction Manager of such omissions, errors, or discrepancies, and in no case proceed in uncertainty. Mistakes resulting from the Contractor's neglect to notify the Construction Manager in such matters shall be corrected at the expense of the Contractor. Bidders are responsible for all electronic documents and their use is at their risk.
H. Construction Manager (DCI Group) has been engaged for this Project to serve as an advisor to the Owner and to provide assistance in administering the Contract for Construction between Owner and the Contractor. The Construction Manager will not be providing any self-performed work for this Project.
I. All Contractors are responsible for on the job supervision of their work, or any subcontracted work. An onsite Superintendent or lead foreman is required during any time that work is being performed to coordinate their work and work with other trades. No superintendent or lead foreman may be replaced without approval of the Owner and DCI Group. Any work necessary to be performed after the regular working hours shall be supervised and shall be done at no additional cost to the Owner.

J. All food and drinks shall be confined to CM designated areas and a maintained covered trash container shall be provided by the contractor. Failure to comply with this rule may cause a need for extra cleaning efforts by others which will result in a back charge to the Contractor.
K. Tools, materials, and equipment storage and security is the responsibility of each Contractor.
L. All work shall comply with the applicable codes and standards adopted by the Authority having Jurisdiction.
M. All Authorities having Jurisdiction inspections shall be requested by the responsible contractor and coordinated through the Construction Manager. Attendance by contractors is mandatory as applicable to the work being inspected.
N. All contractors must have the appropriate licenses to perform work in the jurisdictions.
O. Before ordering any materials or performing any Work, the Contractors shall verify all measurements at the Project Site for the particular Work and be responsible for the correctness of same. No extra charge or compensation will be allowed to the Contractor on account of differences between actual dimensions and the measurements shown on the Project Drawings. Any noticeable discrepancy in this request shall be reported to the Construction Manager immediately for his consideration and decision. All the component parts of the Work shall be carefully checked and laid out in order that the structure as a whole shall conform to the intent of the Project Drawings and Project Manual.
P. The Contractor shall have personnel attending regular project meetings. These meetings will be held at intervals established by the Construction Manager. Contractor must have representative attending when they are on the job or needed for coordination prior to having work start on the project. The representative attending must be able to adequately represent the Contractor and speak on the Contractors behalf providing valuable information to the meeting; specifically, things such as schedule, cost, production, manpower, etc.
Q. Contractor will be required to attend all pre-installation conferences before commencement of related work.
R. Trade Contractor shall complete a daily log for each work day on site and submit to Construction Manager. Content of daily log will be directed by Construction Manager.
S. This Contractor is responsible to protect all openings made to the existing buildings envelope, as required for this bid package work, for the entire time work is being conducted until the new work scope is completed. This protection shall include but is not limited to protection against; rain, snow, wind infiltration, security and temperature fluctuations. Trade Contractor will maintain all weather protection provisions until permanent work is completed. All cost relating to damage incurred to existing facilities as a result of improper weather protection provisions will be borne by the Trade Contractor.

1.02 SAFETY

A. The contractor shall comply with all local and federal, safety and health requirements.
    1. Contractor will provide a safety plan customized for the project to DCI Group.
    2. It is the contractor's responsibility to notify other contractor's on the jobsite of any hazardous materials to which their employees may be exposed.
    3. All Contractors shall inform their employees to immediately advise their supervisor of any unsafe conditions that are encountered. The supervisor shall promptly remediate such danger and/or contact the Construction Manager.
    4. Contractors performing hot work are to have a fire extinguisher in their work areas at all times as applicable.
    5. All Contractors are responsible for their own fall protection.
    6. Contractors are required to provide emergency phone numbers upon the request of the Construction Manager. Emergency phone numbers are numbers where the Contractor can be reached during off hours.
    7. All floor edge, roof and similar openings, barricades, handrails, or cabling for fall protection will be installed by the Contractor that creates the hazard as part of that Contractor's scope of work. At no time shall an opening be left unprotected from fall hazard. All Contractors shall protect and maintain such devices per OSHA standards. When a device conflicts with the work of this bid package or when the

work of this bid package replaces the need for such devices, this Contractor is responsible for removal. If the work of this Contractor requires additional holes/penetrations, this Contractor shall provide necessary protection until final materials are installed.

8. No fire exit can be blocked at any time.

1.03 SITE MANAGEMENT

A. All contractors are responsible for all their own utility locates. This shall include both public and private locates. All Contractors shall coordinate locates with One Call Services.
B. When active services are encountered in the Work, protect, brace and support existing active sewers, gas, electric or other services, where required for proper execution of the Work. If existing active services are encountered that require relocation, make request in writing for determination. Do not proceed with Work until written directions are received. Do not prevent or disturb operation of active services that are to remain.
C. All contractors are required to protect their work. Provide proper protection for all existing work performed by others when performing your work next to, or around, other materials. Repair or replacement of any damaged material will be the responsibility of the contractor who damaged it.
D. All contractors/vendors are responsible for their own cutting and patching unless otherwise specified.
E. All contractors shall provide protection to the building at any penetrations created by that bid package. This shall include protection from rain, wind, temperatures, humidity, animals, or unauthorized access. Protection shall be in place and maintained until final penetration sealants or repairs are made.
F. All contractors are responsible for maintaining dust control during their work.
G. Contractors shall be responsible for maintaining traffic control coordination with the Owner, DCI Group, and the Authority Having Jurisdiction.
H. Public and private roadways will be maintained and cleaned as required by the contractor leaving debris, mud, excess gravel, etc. on roadways at their expense as defined in bid packages.
I. No steel track mounted equipment will be allowed on finished paved surfaces. Any damage to the finished paved surfaces will be repaired at the cost to the contractor causing such damage.
J. Bridging of finished pavement will be responsibility of the contractor. This includes bridging curbs, pavement, sidewalks, etc. Any damage to the aforementioned including pavement markings will be repaired or replaced at the cost of the contractor causing such damage.
K. Contractors that have work that requires equipment off of the existing road ways are required to locate and protect from damage all under and above ground existing features such as utilities, tunnels, landscaping, etc… The Contractor will be responsible to repair back to original condition any damages that occur, including but not limited to ruts and sod damage.
L. Any areas disturbed or damaged by one's operation are to be repaired to Owner/Construction Manager's satisfaction.
M. Contractor shall clean their installed materials prior to the next successor activity.
N. Any signs located on the jobsite must be approved by the Construction Manager. Signage will not be allowed in most cases unless it is required for safety or provides instruction.
O. Receiving, unloading and handling of material provided by the bid package shall be included. Spotting location shall be coordinated with the Construction Manager. All deliveries shall be coordinated with other Contractors and Construction Manager in advance of the delivery. Provide freight to the jobsite for any material provided. If storage is not available onsite, each bid package shall include other means of secure storage. If contractor is not onsite to unload delivery, the delivery will be rejected and will have to be re-scheduled at the contractor's expense. Materials must be stored off the ground, out of the mud and on a solid surface. As required or needed, material should be stored on dunnage or pallets in order to keep it off the ground or surface below. Special storage is the responsibility of respective contractor.
P. Contractor shall not store materials within construction designated locations without approval from Construction Manager. No materials storage will be allowed that may inhibit construction progress.

Q. The Contractors shall layout and correctly establish all lines, levels, grades, positions, walls, partitions, equipment and location of all Work on the Project and be responsible for their accuracy and proper correlation with control lines, monuments and data furnished. Such monuments and data shall be carefully preserved and, if displaced, reset at the expense of the persons displacing them.
R. All Contractors are responsible for the coordination of their work with the complete set of specifications, construction drawings, addenda, request for information (RFI's), Architect's Instruction to Contractor (ITC), shop drawings, coordination drawings, and other contract modifications.
S. Contractor shall carefully inspect any work performed by others that is to receive, align, abut or similarly relate to the Contractor's work and shall immediately notify the Construction Manager in writing of any apparent defects or inconsistencies. The Contractor is responsible for coordinating and verifying the dimension, measurements, and elevations at the project site relevant to the Contractor's work. If Contractor commences his work without such written notice, such commencement shall constitute acceptance of all such work performed by others and of all such field conditions, and all costs incurred in connection with the Contractor's work as a result thereof shall be borne by Contractor.
T. Incorporate construction tolerances for the work of others into the design of the systems in this scope of work. Include field measurements of work by others and any necessary adjustments to systems prior to fabrication to accommodate such allowable tolerances, or accept all costs to correct materials, which do not fit job conditions.
U. Any interior work that is scheduled to be completed while Owner is in normal operation must be sensitive to the Owners continued use of the building. No workers are allowed to be in areas of the building that are not directly related to scope of work. Hallways and general access paths to construction areas must also be kept clean at all times. The Owner has the right at any time to shut down any construction activities that they deem to be too much of a distraction to the occupants of the building.
V. All contractors are responsible for familiarizing themselves with the coordination and sequencing requirements related to Owner furnished equipment.
W. If not already required by the contract documents and reasonably requested by the Construction Manager, the Contractor shall prepare coordinated drawings in areas of congestion specifically noting and advising the Construction Manager of potential conflicts between the Contractor's work and other work at the project. Even with such cooperative and coordinated efforts should a conflict occur the Construction Manager will determine how such conflicts should be resolved and its decision in that regard will be final. The Contractor agrees to abide by such decisions and make any changes required to eliminate such conflict without additional costs or expense to the Owner.

1.04 SCHEDULE MANAGEMENT

A. Prior to the commencement of the construction for the Prime Contract Work, the Prime Contractor shall participate in a minimum of two (2) joint planning meetings with the Construction Manager and other Prime Contractors for the purpose of planning the overall Construction Schedule. A Preliminary Construction Schedule as developed by the Construction Manager will be used as the basis of the overall Construction Schedule. In consultation with the Prime Contractor, the Construction Manager shall incorporate the Prime Contract Work and work of other prime contractors into the overall Construction Schedule for the entire project. Critical Milestones and working hours as defined by the Construction Manager (as included in the bidding documents) will not be altered. The Prime Contractor shall on a weekly basis (at a minimum) provide the Construction Manager scheduling information with regards to progress and work to be performed in the next 4 (four) weeks. The Prime Contractor shall be bound by the Construction schedule. Nothing in the Prime Contract Agreement shall relieve the Prime Contractor of any liability for any unexcused failure to comply with the agreed upon overall Construction Schedule or any completion dates. The Construction Manager shall have the right to coordinate the Prime Contractors, including the right, if necessary, to change the time, order and priority in which the

various portions of the Prime Contract Work and other work associated with the Project shall be performed.

B. All Contractors shall cooperate with the Construction Manager and with other Contractors. The completion of the Work will depend upon a collective effort by all parties involved.

1.05 GENERAL HOUSEKEEPING

A. Daily cleanup (broom clean) of dust and debris from construction operation is part of each contractor's scope of work. If any contractor fails to keep the site clean and organized on a continuous basis, the Construction Manager will notify the contractor in writing only once. The contractor will then have 24 hours to correct the situation. If the contractor fails to correct the situation, the Construction Manager will hire another party for cleaning and charge the said contractor. Trade Contractor shall submit prior to beginning work a plan to the Construction Manager defining manpower and methods for achieving daily cleanup. If Construction Manager deems necessary, each Trade Contractor shall provide 1 employee for each 5 employees on the project to clean all work areas and/or staging areas to a broom clean condition. If the Trade Contractor has less than 5 employees on site, the contractor will provide 1 employee to the necessary cleanup requirement. Cleanup duration will take as long as it takes to achieve the broom clean results.

B. Contractor plan tables and break areas will be restricted to the areas identified on 3rd floor only. Plan tables and break set ups outside of this area will not be allowed until this area must be vacated for final finishes.

SPECIAL WORK REQUIREMENTS

A. Bidders are to hold their bids for a period of thirty (30) days after the bid.

B. Contractors and their employees shall show upmost respect for the occupying students and staff. Profanity and unnecessary loud language will not be tolerated.

C. Each Contractor working in Owner occupied space will provide necessary means of protection to floors, walls, ceilings, equipment as required to accomplish work without harming or damaging existing conditions. All damage performed during this work will be charged to the responsible contractor.

D. The use of motorized scissor lifts will not be allowed except under special circumstances and must have prior approval from the Construction Manager.

E. All deliveries must be accepted by the Contractor.

F. Owner will provide snow removal to all existing pavements on campus that are not under construction. See specific Contractor's responsibility under specific Bid Packages.

G. A trash chute will be provided by the construction manager for use prior to finishes being installed.

H. Contractor includes complete cleanup and haul off to dumpster for all typical construction debris resulting from this scope of work. Bid Package #1 Contractor will be responsible for providing dumpsters as required while work by Bid Package #1 is occurring and understands that ALL Bid Packages will be using dumpster. Once Bid Package #1 scope of work is complete, dumpster services will be provided by the construction manager. A dumpster will be provided at the trash chute and at the dock.

I. Each Prime Contractor to provide brooms, shovels and other equipment for cleanup for their respective scope of work. Excess materials shall be removed from the site at the Contractor's expense. All primes shall remove debris on a daily basis.

J. Contractor will be responsible to provide portable generators or an alternative power source for all tools and equipment that require a power source higher than 120 Volt.

K. Contractors working on roofs are required to take appropriate precautionary measures to protect existing roofing from damage. Contractors are required to take all precautionary measures necessary to ensure that their items do not fall or blow off the roofs.
L. Prior to performing work in areas with smoke and fire detection systems the Contractor shall coordinate with the CM precautionary measures to eliminate false alarms. If the fire alarm system is activated and there is not an emergency the Contractor responsible for the false activation shall be responsible to pay for all resulting owner incurred expenses such as Emergency Response fees.
M. Contractors will have access to one set of restrooms for men's and women's on the 3rd floor of the Hoover Building. It will be the responsibility of all contractors to prevent damage to these restrooms and to keep them clean and orderly. Public restrooms in the remainder of the building will be off limits to contractors.
N. Contractors shall document existing conditions prior to start of work. All damage to existing pavements, landscaped areas, and all other existing property will be repaired by the responsible Contractor. Interior as well.
O. The Prime Contractor's shall provide the Construction Manager detailed information as outlined below for the purpose of developing the Construction Schedule:

a. SUBMITTALS:

i. Submittal Schedule: Prime Contractor shall submit a submittal schedule listing all required submittals, submittal "To CM" dates, procurement durations, and expected dates for materials to be on the jobsite. The submittal schedule shall be submitted to the CM within five (5) business days of receipt of Owner/Prime Contractor Agreement.
ii. Format: Submittal Schedule shall be prepared in an Excel spreadsheet.
iii. Materials & Long Lead Procurement: Prime Contractor shall identify any/all submittal items that require "field verifies" and also identify the dates when these field verifies can be taken.

P. See preliminary construction schedule in Section 00 3113. This schedule will aid the bidder(s) in understanding the preliminary scheduling and planning for the project. As the construction schedule is finalized the **Prime Contractor and their Subcontractors** shall participate in a meeting with the Construction Manager and other Prime Contractors for the purpose of presenting the overall Construction Schedule. These "Subcontractors" shall be any/all subcontractors who will be performing Work on the project.
Q. Per the preliminary construction schedule the bidder(s) acknowledges that there are multiple mobilizations, phases, sub-phases, material deliveries, and milestone completion dates required in order to complete the work.
R. The Owner owns the weather duration contingency as shown in the preliminary construction schedule on the following pages. The Construction Manager manages and will adjust the weather duration contingency. As weather days are not utilized the substantial completion dates shall be adjusted accordingly.
S. Expected work hours will be 7:30 AM to 5:00 PM Monday thru Friday (5 day work week). Contractors requiring working time other than these hours are to coordinate and receive approval in advance from the Construction Manager. The Contractor shall provide at his expense increased work crews and/or overtime necessary to meet the scheduled milestones. Contractor shall immediately notify the Construction Manager of any delays in the work.
T. After contract award bid the Contractor is required to attend a meeting with the Construction Manager to review bid package scopes.
U. Parking and material staging on site will be limited. All contractors shall coordinate one's parking and material staging with the DCI Group Project Manager, DCI Superintendent or DCI Designated Personnel.
V. The jobsite is on Public Property. Smoking or smokeless tobacco **WILL NOT** be allowed. Also, no shelled sunflower seeds are allowed inside the enclosed facility.
W. No radios or headsets are allowed in the construction areas.

X. All warranties start at Project Substantial Completion, Contractor will be required to provide from this date and not the startup date of the equipment. Contractor will not be compensated for any cost related to purchasing extended warranties to meet this requirement. See Special Work Requirements for project schedule information.
Y. Contractors shall maintain accurate as-built construction records and provide complete clean and legible copies to Construction Manager on completion of work. All Contractors will be required to provide electronic copies as well as hard copies of all O&M's and as-built drawings. See Project Manual for additional Closeout requirements.

END OF SECTION

Exhibit G Drawings

DOC CBC 2 AMPB Building Renovations
111 Sherman Avenue Ames, Iowa 50010
Request for Quote RFQ 940500-02

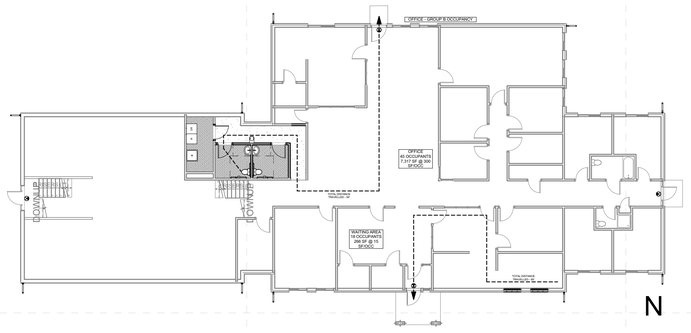
Due Tuesday, November 26, 2024, at 2:00PM (CT)

9405.00 DOC CBC 2 AMPB BUILDING RENOVATION
MECHANICAL SYSTEM REPLACEMENT

C:\Users\niken\Horizon Architecture\Horizon Architecture - Documents\Projects\General Projects\G24-023 DAS AMPB Building Renovations\1 - Model and Design\AMES PROBATION AND PAROLE OFFICE.pln

LIFE SAFETY LEGEND

EXIT TRAVEL PATH AND DISTANCE (250' MAX)	TOTAL DISTANCE TRAVELED - XXX'
EGRESS COMPONENT CAPACITY	XX" STAIR EGRESS CAPACITY - XX OCCUPANT LOAD - X
FIRE EXTINGUISHER CABINET	FEC
EXIT SIGN	



4 LIFE SAFTEY PLAN
SCALE: 1/16" = 1'-0"

0 8' 16' 32'

BUILDING CODE SUMMARY

APPLICABLE CODES AND ORDINANCES
2015 IBC: ALL APPLICABLE CHAPTERS
ANSI 117.1, 2009 EDITION: ALL APPLICABLE CHAPTERS

PROJECT SCOPE:
OFFICE BUILDING MECHANICAL SYSTEM REPLACEMENT

BUILDING AND PROJECT DATA

BUILDING DESCRIPTION AND USE	2 STORY BLDG.	COMMERCIAL, RENOVATION	
	IBC 2015	**REQUIRED/ALLOWED**	**PROVIDED**
USE AND OCCUPANCY	CHAPTER 3		B
CONSTRUCTION TYPE	SECTION 602 AND TABLE 601		VB
AUTOMATIC SPRINKLER SYSTEM	SECTION 903	NO	NO
BUILDING HEIGHT	TABLE 504.3	40' MAX.	APPX. 13'
BUILDING STORIES	TABLE 504.4	2	2
LARGEST FLOOR AREA / STORY/1ST FLOOR AREA	TABLE 506.2	9,000 SQ. FT.	4,674 SQ. FT.

OCCUPANCY CALCS	**AREA**	**REQUIRED**	**OCCUPANT LOAD**
OFFICE AREA	4,408 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	45
WAITING AREA	266 SQ. FT. (GROSS)	15 SQ. FT. / PERSON (GROSS)	18
LOWER OFFICE AREA	1,493 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	15
UPPER OFFICE AREA	1,416 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	15
ALL OCCUPANCIES	**7,583 SQ. FT. (GROSS)**		**93**

FIRE RESISTANCE RATINGS	**IBC 2015**	**REQUIRED**	**PROVIDED**
PRIMARY STRUCTURAL FRAME	TABLE 601 AND SECTION 704	0 HOURS	1 HOURS MIN
BEARING WALLS			
EXTERIOR	TABLE 601, 602, 721 & SECTION 705	0 HOURS	0 HOURS MIN
INTERIOR	TABLE 601	0 HOURS	0 HOURS MIN
NONBEARING WALLS AND PARTITIONS			
EXTERIOR	TABLE 601, 602 & SECTION 705	0 HOURS	0 HOURS MIN
INTERIOR	TABLE 601	0 HOURS	0 HOURS MIN
FLOOR CONSTRUCTION	TABLE 601	0 HOURS	0 HOURS MIN
ROOF CONSTRUCTION	TABLE 601	0 HOURS	0 HOURS MIN
EXTERIOR WALL OPENINGS			
UNPROTECTED	TABLE 705.8.3	NOT REQUIRED	NOT REQUIRED
PROTECTED	TABLE 705.8.2	NOT REQUIRED	NOT REQUIRED

MEANS OF EGRESS	**IBC 2015**	**REQUIRED**	**PROVIDED**
MAXIMUM PATH OF COMMON EGRESS TRAVEL	SECTION 1006.2.1	75'	35'
MAXIMUM EXIT ACCESS TRAVEL DISTANCE	SECTION 1017 & TABLE 1017.2	200'	85' MAX
MINIMUM CORRIDOR WIDTH	SECTION 1020	44"	55"
MAXIMUM DEAD END	SECTION 1020	20'	21'
MINIMUM NUMBER OF EXITS	SECTION 1006 & TABLE 1006.3.2	2	4

SHEET INDEX

ABBREVIATIONS

A.D.	AREA DRAIN	DN	DOWN	HORIZ.	HORIZONTAL	PL. LAM	PLASTIC LAMINATE	U.L.	UNDERWRITERS LABORATORIES
ABV.	ABOVE	DWG.	DRAWING	HT.	HEIGHT	QTY.	QUANTITY	VEST.	VESTIBULE
ADA	ACCESSIBLE / AMERICANS WITH DISABILITIES ACT	DEPT.	DEPARTMENT	INSUL.	INSULATION / INSULATING	R	RISER	V.C.T.	VINYL COMPOSITION TILE
		DBL.	DOUBLE	I.D.	INSIDE DIAMETER	R.W.C.	RAIN WATER CONDUCTOR	W/	WITH
ADJ.	ADJUSTABLE	DIM.	DIMENSION	INCAND.	INCANDESCENT	REINF.	REINFORCING / REINFORCED	W.C.	WATER CLOSET
A.o.R.	AREA OF REFUGE	DR.	DOOR	JAN.	JANITOR	REQ.	REQUIRED	WD	WOOD
ALUM.	ALUMINUM	EXIST.	EXISTING	JT.	JOINT	R.O.	ROUGH OPENING	&	AND
ALT.	ALTERNATE	EQ.	EQUAL	LBS.	POUNDS	REV.	REVISED / REVISION	@	AT
A.F.F.	ABOVE FINISHED FLOOR	E.C.	ELECTRICAL CONTRACTOR	LAV.	LAVATORY	REFL.	REFLECTED	±	PLUS OR MINUS
AC.	ACOUSTIC / ACOUSTICAL	EL.	ELEVATION	LAM.	LAMINATE	REC.	RECESSED	°	DEGREE
A.F.	ALUMINUM FACE	ELEV.	ELEVATOR	L.P.	LOW POINT	RAD.	RADIUS	∠	ANGLE
APPX.	APPROXIMATE / APPROXIMATELY	ELEC.	ELECTRIC / ELECTRICAL	MAX.	MAXIMUM	S.S.	STAINLESS STEEL	[	CHANNEL
		EXP.	EXPANSION	MFR.	MANUFACTURER / MANUFACTURED	ST.	STREET	#	NUMBER
BD.	BOARD	EXT.	EXTERIOR	MTL.	METAL	SIM.	SIMILAR	□	SQUARE
BLK.	BLOCK / BLOCKING	EA.	EACH	MIN.	MINIMUM	STL.	STEEL	Ø	ROUND / DIAMETER
BLDG.	BUILDING	F.D.	FLOOR DRAIN	MIRR.	MIRRORED	SQ.	SQUARE	℄ / C.L.	CENTER LINE
B.O.	BOTTOM OF	F.E.	FIRE EXTINGUISHER	MTD.	MOUNTED	SAN.	SANITARY	⏥ / PL.	PLATE
B.O.S.	BOTTOM OF STEEL	F.E.C.	FIRE EXTINGUISHER CABINET	M.O.	MASONRY OPENING	SUSP.	SUSPENDED	⊓	U-BAR
CAB.	CABINET			MISC.	MISCELLANEOUS	STD.	STANDARD	∟	LEG-BAR
C.C.	CENTER-TO-CENTER	FIN.	FINISH / FINISHED	MECH.	MECHANICAL	SPEC.	SPECIFICATION		
CLG.	CEILING	FLR.	FLOOR	N.I.C.	NOT IN CONTRACT	TEL.	TELEPHONE		
CLOS.	CLOSET	F.O.	FACE OF	NO.	NUMBER	T.O.	TOP OF		
C.M.	CONSTRUCTION MANAGER	FT.	FEET / FOOT	N.T.S.	NOT TO SCALE	T.O.S.	TOP OF STEEL		
CMU	CONCRETE MASONRY UNIT	FLUOR.	FLUORESCENT	O.C.	ON CENTER	T.O.W.	TOP OF WALL		
C.J.	CONTROL JOINT	GYP.	GYPSUM	O.D.	OUTSIDE DIAMETER	TOIL.	TOILET		
CONC.	CONCRETE	GALV.	GALVANIZED	OPP.	OPPOSITE	TYP.	TYPICAL		
CORR.	CORRIDOR	GA.	GAUGE	OPG.	OPENING	THK.	THICK		
COL.	COLUMN	G.C.	GENERAL CONTRACTOR	P.C.	PLUMBING CONTRACTOR	TMP.	TEMPERED		
CONT.	CONTINUE / CONTINUOUS	HR.	HOUR	P.F.	PANEL FACE	T.S.G.	TEMPERED SAFETY GLASS		
CONTR.	CONTRACTOR	H.P.	HIGH POINT	PR.	PAIR	U.O.N.	UNLESS OTHERWISE NOTED		
DIA.	DIAMETER	HVAC	HEAT, VENTILATION, AIR-CONDITIONING	P.T.	PRESSURE TREATED				
DTL.	DETAIL								

VERIFY SCALE
BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

GRAPHIC SYMBOLS

WINDOW MARKER — W01

SKYLIGHT MARKER — S01

DOOR IDENTIFIERS
DOOR IDENTIFIER (ELEVATIONS/SECTIONS) — D01.1
6" TYPICAL, UNLESSOTHERWISE NOTED
DOOR IDENTIFIER (PLANS) — D01.1

SECTION / DETAIL MARKER
XX / YY
INDICATES SECTION LOCATION ON SHEET
INDICATES SHEET ON WHICH DRAWING IS SHOWN

INTERIOR ELEVATION MARKER
A1 / D4 / XX / B2 / C3
INDICATES ELEVATION LOCATION ON SHEET
INDICATES SHEET ON WHICH ELEVATION IS SHOWN

ELEVATION / SECTION MARKER
XX / YY
INDICATES ELEVATION LOCATION ON SHEET
INDICATES SHEET ON WHICH DRAWING IS SHOWN

DETAIL / ENLARGED PLAN MARKER
XX / YY
INDICATES DETAIL LOCATION ON SHEET
INDICATES SHEET ON WHICH DETAIL IS SHOWN

SPACE DESIGNATION
OFFICE
003
1/A-201
SPACE NAME
SPACE NUMBER
ENLARGED PLAN REFERENCE

WALL TYPE MARKER — 4C

KEYNOTE IDENTIFIER
1.01.01
KEYNOTE: SEE KEYNOTE LEGEND ON DRAWING'S LAYOUT
1.01.01
ALTERNATE KEYNOTE: SEE KEYNOTE LEGEND ON DRAWING'S LAYOUT

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

horizon. original. architecture.

9405.00 DOC CBC 2 AMPB BUILDING RENOVATION
111 SHERMAN AVENUE AMES IA 50010

MARK	DATE	DESCRIPTION

PROJECT NO: #Pln
DATE: 9/6/2024
DRAWN BY: MSN
COPYRIGHT

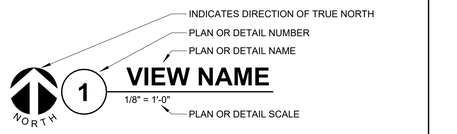
SHEET TITLE
COVER SHEET

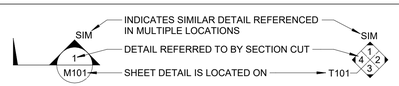
C-101

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2015 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	PARKER POLASCHEK
MECHANICAL	GRADY DEGENEFFE
ELECTRICAL	ZACH ROSS

MECHANICAL DESIGN CONDITIONS:

DESIGN CONDITIONS: **BASED ON WEATHER DATA FOR: AMES, IA**

SUMMER: 95°F DRY BULB, 78°F WET BULB
WINTER: -15°F DRY BULB

TYPICAL ROOM SETPOINTS:

SUMMER DESIGN: 75°F DRY BULB, NO HUMIDITY REQUIREMENT
WINTER DESIGN: 70°F DRY BULB, NO HUMIDITY REQUIREMENT

REFER TO CONTROL DIAGRAMS FOR ROOM SPECIFICS.

VENTILATION SHEET INDEX

VENTILATION SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
	DUCT CAP
	DUCT DOWN
	DUCT UP
	SUPPLY/OUTSIDE AIR DUCT SECTION
	RETURN AIR DUCT SECTION
	EXHAUST/RELIEF AIR DUCT SECTION
SD-1 6/115	AIR TERMINAL PROPERTIES

VENTILATION ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
CFSD	CONTROL/FIRE/SMOKE DAMPER
DN	DOWN
DPG (0-2")	DIFFERENTIAL PRESSURE GAUGE (RANGE)
DPS	DIFFERENTIAL PRESSURE SWITCH
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FSD	FIRE/SMOKE DAMPER
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
SCCR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
TAB	TERMINAL AIR BOX
TD	TRANSFER DUCT
TYP	TYPICAL
UC-1	DOOR UNDERCUT BY OTHERS (1" TYPICAL)
UON	UNLESS OTHERWISE NOTED

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR, PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.
12. PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN REMOVED EQUIPMENT/ REFRIGERANT PIPING. RECLAIMED REFRIGERANT SHALL HAVE DOCUMENTATION AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).

VENTILATION GENERAL NOTES:

1. ALIGN TEMPERATURE SENSORS WITH LIGHT SWITCHES AND WHEN IN CLOSE PROXIMITY TO EACH OTHER.
2. PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
3. DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
4. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
5. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
6. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
7. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
9. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS .
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6 '-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.

CONDENSING UNIT SCHEDULE

TAG NAME	AREA SERVED	NOMINAL DESIGN TONS	REFRIGERANT	AMBIENT TEMP °F	NUMBER OF COMPRESSORS	NUMBER OF STAGES	NUMBER OF FANS	ELECTRICAL								MAX. DIMENSIONS						NOTES
												DISCONNECT		CONTROLLER/ STARTER								
								VOLTAGE	PHASES	MCA	MOCP	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	SCCR	LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL (NOTE 1)	
F-1C		5	R410A	95.0	1	2	1	208	1	30	50	EC	NF	MFR	5000	35	30.5	45	298	LENNOX	EL18	
F-2C		4	R410A	95.0	1	2	1	208	1	24	40	EC	NF	MFR	5000	35	30.5	45	270	LENNOX	EL18	
F-3C		5	R-410A	95.0	1	2	1	208	1	30	50	EC	NF	MFR	5000	35	30.5	45	298	LENNOX	EL18	
F-4C		4	R-410A	95.0	1	2	1	208	1	24	40	EC	NF	MFR	5000	35	30.5	45	270	LENNOX	EL18	

SCHEDULE GENERAL NOTES:

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER

B. DISCONNECT TYPE:
NF = NON-FUSED

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
VFD = VARIABLE FREQUENCY DRIVE

D. FAN RPM SHALL NOT EXCEED 110% OF SCHEDULED VALUE, WITH THE SCHEDULED WHEEL TYPE. SUBSTITUTION OF BI OR BIA FANS FOR FC IS ACCEPTABLE IF EFFICIENCY IS NOT LOWER.

E. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

F. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

FURNANCE SCHEDULE

TAG NAME	AREA SERVED	EXT. S.P. IN. W.C.	FAN/BLOWER				ELECTRICAL						HEATING		EVAPORATOR				MAX. DIMENSIONS						EVAPORATOR COIL MODEL
			CFM (HIGH SPEED)	MAX. COIL A.P.D. IN. W.C.	HP	RPM	VOLTAGE	PHASES	DISCONNECT BY (NOTE A)	DISCONNECT TYPE (NOTE B)	CONTROLLER/ STARTER BY (NOTE A)	CONTROLLER/ STARTER SCCR	MINIMUM EFFICIENCY AFUE	MINIMUM OUTPUT MBH	MAX. LAT °F	EAT DB °F	EAT WB °F	TOTAL MBH	LENGTH	WIDTH	HEIGHT	WEIGHT	MANUFACTURER	MODEL	
F-1		0.8	1,664	0.23	1	ECM	120 V	1	EC	NF	MFR	5000	97	106	55	80	67	58.5	21	29.25	33	174	LENNOX	EL297	CX35
F-2		0.8	1,252	0.14	0.75	ECM	120 V	1	EC	NF	MFR	5000	97	85	55.6	80	67	46.8	21	29.25	33	0	LENNOX	EL297	CX35
F-3		0.8	1,763	0.21	1	ECM	120 V	1	EC	NF	MFR	5000	97	127	56.7	80	67	58.9	21	29.25	33	0	LENNOX	EL297	CX35
F-4		0.8	1,229	0.13	0.75	ECM	120 V	1	EC	NF	MFR	5000	97	85	55.1	80	67	46.7	21	29.25	33	0	LENNOX	EL297	CX35

E

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111 N SHERMAN AVE, AMES IA 50010

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2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	PARPOL

SHEET TITLE
HVAC COVERSHEET

SCALE
Scale: As indicated

SHEET NUMBER
M000

24003771.00 9/6/2024 12:07:24 PM IDAS/Ames/DOC CBC 2 AMPB

CONDUIT INSTALLATION SCHEDULE

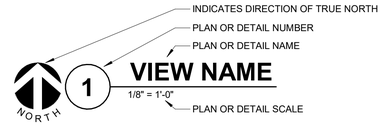
THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.

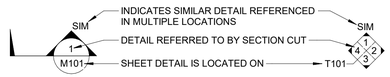
INSTALLATION TYPE	RMC	EMT	ASR
FEEDERS: SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS, MOTOR CONTROL CENTERS, ETC.		X	
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X	
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X	
FLOOR MOUNTED EQUIPMENT FEEDERS: PUMPS, ETC. (INCLUDE NO MORE THAN 6 FEET OF LFMC TO PUMP)		X	
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X	
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X		
ELEVATED CONCRETE SLABS (ABOVE GRADE)	X		
INTERIOR LOCATIONS WITH FINISHED CEILING AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS		X	
INTERIOR LOCATIONS WITHOUT FINISHED CEILINGS: CONCEALED IN WALL, EXPOSED ABOVE CEILINGS		X	
EXISTING INTERIOR LOCATIONS WITH FINISHED CEILINGS AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED		X	X

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
———— NEW
- - - - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
———— EXISTING
- - - - - - - - EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
— — — — EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2015 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	PARKER POLASCHEK
MECHANICAL	GRADY DEGENEFFE
ELECTRICAL	ZACH ROSS

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
V.C.	VENTILATION CONTRACTOR

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
E / E	ECONN	26 05 33	ELECTRICAL CONNECTION
▭	PANEL '###'	--	PANELBOARD - SURFACE MOUNT
▭ ◪	MX-#	26 24 19	SURFACE MOUNTED MANUAL SWITCH. REFER TO DISC/STA SCHEDULE.
⇒	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
⇒	REC-DUP-GFI	26 27 26	DUPLEX GFI RECEPTACLE, 125V
⇒	REC-SIM-1430R	26 27 26	RECEPTACLE, 14-30R, 125/250V

ELECTRICAL SYMBOL LIST

SYMBOL:	SPEC TAG:	SPEC SECTION:	DESCRIPTION:
S ##	SW-O	26 09 33	SWITCH SUBSCRIPTS: O = DUAL TECHNOLOGY OCCUPANCY SENSOR WITH WALL SWITCH
OC ##	SW-OC-A	26 09 33	OCCUPANCY SENSOR - CEILING MOUNTED SUBSCRIPTS: A = ULTRASONIC - TWO SIDED CORRIDOR COVERAGE

RECEPTACLE SUBSCRIPT KEY:

DEVICE KEY:

DEVICE — # = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A — MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH

LUMINAIRE CIRCUIT AND CONTROL KEY

LUMINAIRE

F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
a = SWITCH DESIGNATION

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

ELECTRICAL ABBREVIATION KEY

ABBR:	DESCRIPTION:
ABV	ABOVE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ASR	ARCHITECTURAL SURFACE RACEWAY
BC	BELOW COUNTER
C	CONDUIT (BRANCH CIRCUIT OR FEEDER CONTEXT)
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUNDING CONDUCTOR
NC	NORMALLY CLOSED
NEMA #	NEMA RATING
NIC	NOT IN CONTRACTED SCOPE
NO	NORMALLY OPEN
ROOF	EQUIPMENT LOCATED ON ROOF ABOVE
SM	SURFACE MOUNTED
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
3. ELECTRICAL CONTRACTOR SHALL REVIEW EXISTING CONDITIONS TO VERIFY ACCESSIBILITY TO THE AREAS OF THEIR WORK INCLUDING WALLS, FLOOR, CEILINGS, CEILING TILES/GRID, AND ROOF. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE CUTTING, REMOVAL, PATCHING, AND REINSTALLATION OF AFFECTED AREAS ASSOCIATED WITH THEIR WORK BY COORDINATING WITH THE GENERAL CONTRACTOR OR QUALIFIED CONTRACTOR.
4. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.

ELECTRICAL INSTALLATION NOTES:

1. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.
2. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
3. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS.
4. CONNECTION FOR ELECTRIC WATER COOLERS (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.
5. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS,CARBON MONOXIDE DETECTORS, AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE. CARBON MONOXIDE DETECTORS SHALL BE LOCATED 10 PLUS FT FROM FIRE PLACES, COOKING, AND SIMILAR FUEL-BURNING APPLIANCES.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
7. CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
9. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL SHEET INDEX

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111 N SHERMAN AVE, AMES IA 50010

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IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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KEY PLAN

AGENCY APPROVAL

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PROJECT #24003771.00

REVISIONS

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Drawn: ZACROS
Checked: KRISPI
Approved: KRISPI

SHEET TITLE

ELECTRICAL COVERSHEET

SCALE

Scale: As indicated

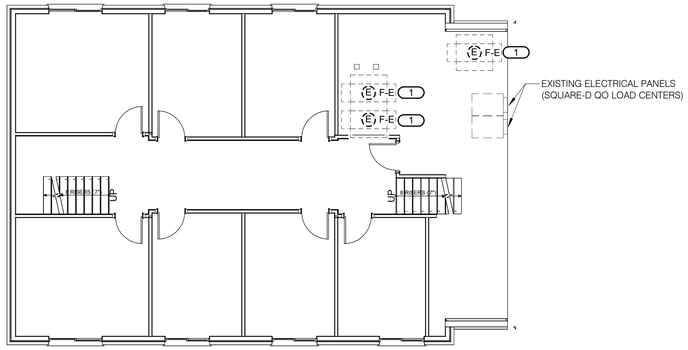
SHEET NUMBER

E000

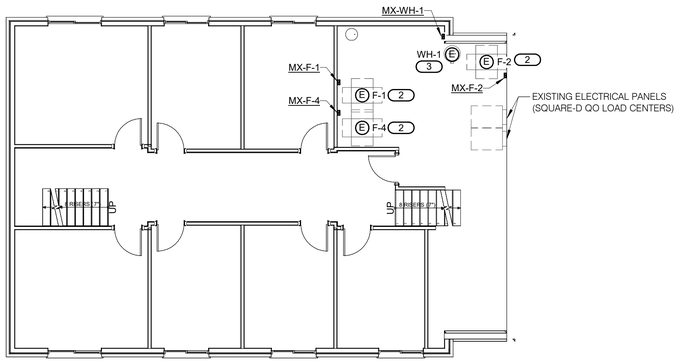
IDAS/Ames/DOC CBC 2 AMPB 9/6/2024 9:06:17 AM 24003771.00

KEYNOTES: (#)

1. DISCONNECT EXISTING FURNACE. EXISTING CONDUIT AND CONDUCTORS SHALL REMAIN IN PLACE FOR INSTALLATION OF NEW FURNACE.
2. CONNECT NEW FURNACE TO EXISTING CIRCUIT SERVING PREVIOUSLY REMOVED UNIT. EXTEND EXISTING CONDUIT AND CONDUCTORS AS NECESSARY.
3. CONNECT TO NEW 20A/1P CIRCUIT BREAKER IN EXISTING ELECTRICAL PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.



NORTH 1 **BASEMENT DEMOLITION PLAN - ELECTRICAL**
1/8" = 1'-0"



NORTH 2 **BASEMENT PLAN - ELECTRICAL**
1/8" = 1'-0"

IDAS/Ames/DOC CBC 2 AMPB
9/6/2024 9:06:18 AM
24003771.00

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IMEG
The FUTURE. Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
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Drawn	ZACROS
Checked	KRISPI
Approved	KRISPI

SHEET TITLE
BASEMENT PLAN - ELECTRICAL

SCALE
Scale: 1/8" = 1'-0"

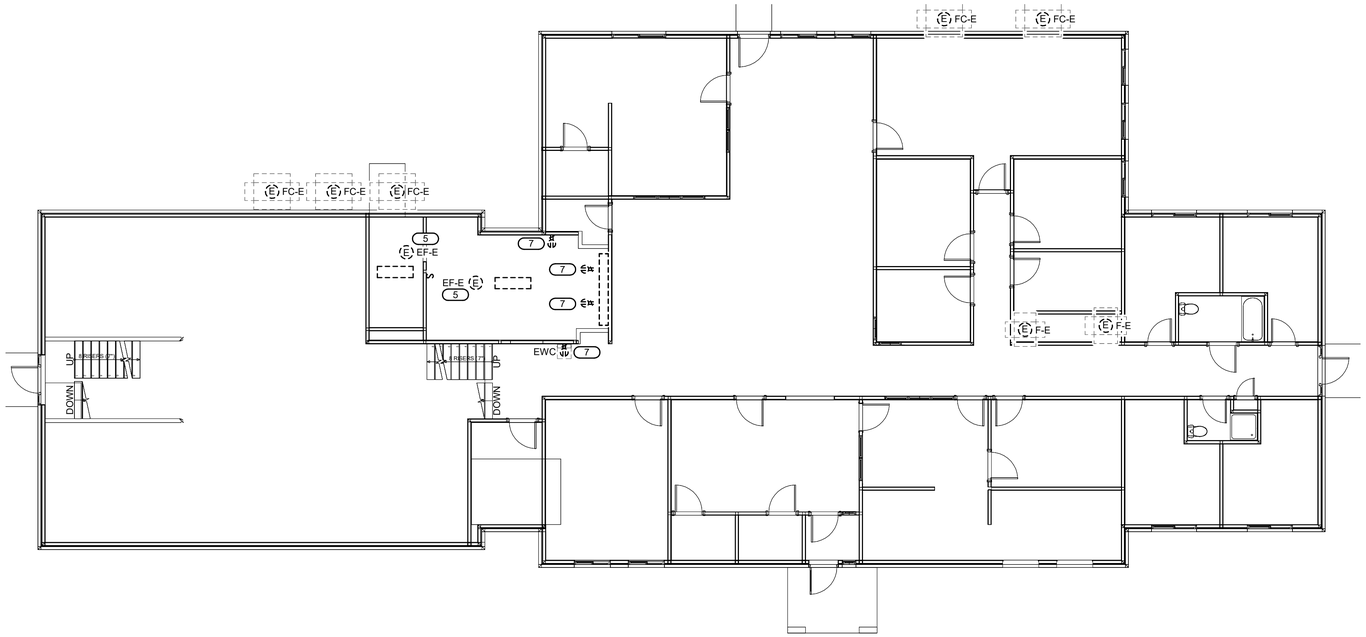
SHEET NUMBER
E200

SHEET NOTES:

1. CONNECT LIGHTS TO EXISTING LIGHTING CIRCUIT SERVING THE AREA. EXTEND USING 2# 12 & 1#12 EGC IN 3/4" C.
2. EXISTING ELECTRICAL PANEL LOCATED IN BASEMENT. REFER TO E200 FOR LOCATION.

KEYNOTES: (#)

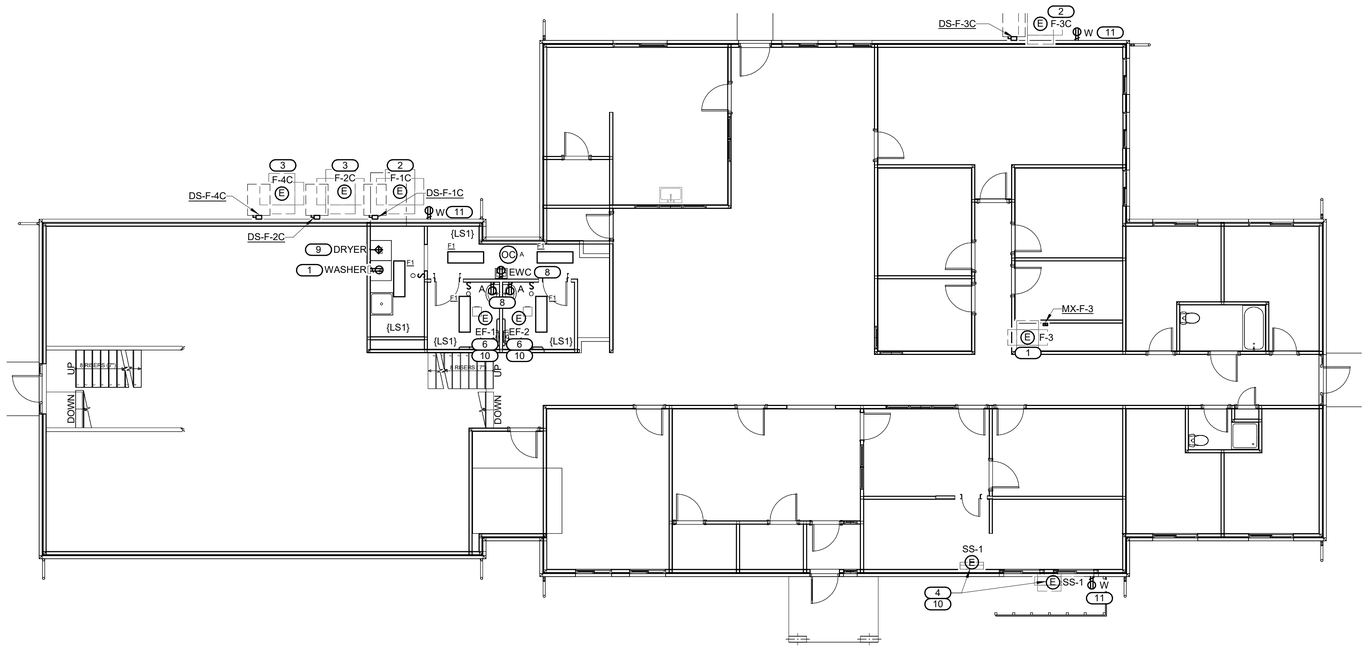
1. CONNECT TO NEW 20A/1P CIRCUIT BREAKER IN EXISTING ELECTRICAL PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.
2. CONNECT TO NEW 50A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#8 & 1#10 EGC IN 3/4" C. UTILIZE EXISTING SPACE IN PANEL PREVIOUSLY SERVING A/C UNITS.
3. CONNECT TO NEW 40A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#8 & 1#10 EGC IN 3/4" C. UTILIZE EXISTING SPACE IN PANEL PREVIOUSLY SERVING A/C UNITS.
4. CONNECT INDOOR AND OUTDOOR UNIT OF SPLIT SYSTEM TO A NEW 15A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.
5. DISCONNECT EXISTING EXHUAST FAN. CONDUIT AND CONDUCTORS TO REMAIN IN PLACE FOR INSTALLATION OF NEW EXHAUST FAN.
6. CONNECT EXHAUST FAN TO EXISTING CIRCUIT SERVING EXHAUST FANS. EXTEND EXISTING CONDUIT AND CONDUCTORS AS NECESSARY TO NEW LOCATION.
7. DEMOLISH CONDUIT AND CONDUCTORS TO JUNCTION BOX ABOVE CEILING. EXISTING CIRCUIT TO BE EXTENDED TO NEW RECEPTACLES.
8. EXTEND EXISTING RECEPTACLE CIRCUIT FROM JUNCTION BOX ABOVE CEILING TO NEW DEVICE USING 2#12 & 1#12 EGC IN 3/4" C.
9. CONNECT TO NEW 30A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#10 & 1#10 EGC IN 3/4" C.
10. DISCONNECT/CONTROLLER TO BE PROVIDED BY MANUFACTURER, INSTALLED BY EC.
11. CONNECT TO NEAREST 120V RECEPTACLE CIRCUIT USING 2#12 & 1#12 EGC IN 3/4" C.



NORTH

1 LEVEL 01 DEMOLITION PLAN - ELECTRICAL

1/8" = 1'-0"



NORTH

2 LEVEL 01 PLAN - ELECTRICAL

1/8" = 1'-0"

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2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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SHEET TITLE

LEVEL 01 PLAN - ELECTRICAL

SCALE

Scale: 1/8" = 1'-0"

SHEET NUMBER

E201

24003771.00 9/6/2024 9:06:21 AM IDAS/Ames/DOC CBC 2 AMPB

LED LUMINAIRE SCHEDULE

(DESC) DOOR:	**DISTRIBUTION:**	**BEAMWIDTH:**	**(L/L) LENS/LOUVER:**	K19 - KSH19 .156" ACRYLIC
FA - FLAT ALUMINUM	II - ANSI/IES TYPE 2 DISTRIBUTION	NSP - VERY NARROW SPOT	A - .125" ACRYLIC	M - MATTE DIFFUSE CLEAR
FS - FLAT STEEL	III - ANSI/IES TYPE 3 DISTRIBUTION	SP - SPOT	B - BAFFLE/LOUVER	N - NONE
RA - REGRESSED ALUMINUM	IV - ANSI/IES TYPE 4 DISTRIBUTION	MD - MEDIUM	C - CLEAR ALZAK	P - POLYCARBONATE
RS - REGRESSED STEEL	V - ANSI/IES TYPE 5 DISTRIBUTION	WD - WIDE	F - FROSTED ACRYLIC	R - HIGH IMPACT DR ACRYLIC
FINISH:		VWD - VERY WIDE	G - TEMPERED GLASS	SS - SEMI-SPECULAR CLEAR
PAF - PAINT AFTER FABRICATION		WW - WALL WASH	K - KSH12 .125" ACRYLIC	O - OTHER (SEE DESCRIPTION)
CFSA - COLOR-FINISH SELECTION BY ARCHITECT				[DESIGN SPECIFIC BLANKS]
(MTG) MOUNTING:	RE - RECESSED		**(WATT) PER:**	FIX - FIXTURE, FT - FOOT, LAMP
CL - CEILING SURFACE	SP - SUSPENDED		**(TYPE) LED**	RGB - COLOR CHANGING LED
CV - COVE	SU - SURFACE		LED - LIGHT EMITTING DIODE	RGBW - COLOR CHANGING + WHITE
FR - FLANGED RECESSED	UC - UNDER CABINET		TLED - TUBULAR LED LAMP	RGBA - COLOR CHANGING + AMBER
P - PERIMETER	WL - WALL		OLED - ORGANIC LED	RLED - RETROFIT LED
PL - POLE	O - OTHER (SEE DESCRIPTION)		DLED - DYNAMIC TUNABLE LED	WLED - WARM DIM LED
(TYPE) DRIVER:				
0-10V - 0-10V DIMMING	EB - ELECTRONIC	HL - HIGH/LOW (100%/50%) STEP DIM		MV - MULTI-VOLTAGE ELECTRONIC
DALI - DIGITAL ADDRESSABLE	ELV - ELECTRONIC LOW VOLTAGE	LINE - LINE VOLTAGE DIMMING		REM - REMOTE
DMX - DIGITAL MULTIPLEX	EM - EMERGENCY BATTERY	ML - MULTI-LEVEL SWITCHING		O - OTHER (SEE DESCRIPTION)

CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.

VERIFY AND COORDINATE ALL CEILING TYPES WITH LUMINAIRE MOUNTING AND TRIM REQUIREMENTS PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT AND INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
UNLESS INDICATED ON LIGHTING PLANS OR BELOW, REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

REFER TO SPECIFICATION SECTIONS LED LIGHTING 26 51 19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
INTERIOR CORRELATED COLOR TEMPERATURE 4000K, COLOR RENDERING INDEX (CRI) AT OR ABOVE 80, UNLESS NOTED OTHERWISE.

				DIMENSIONS				WATT		LED			DRIVER		
ITEM	DESCRIPTION	L/L	MTG	L	W	H	DIA.	ANSI WATTS	PER	TYPE	QTY	DELIVERED LUMENS (MIN)	VOLTS	TYPE	MANUFACTURER AND MODEL
F1	WRAPAROUND, LOW PROFILE, STEEL HOUSING AND END PLATES, FROSTED PRISMATIC ACRYLIC DIFFUSER.	O	SU	4'-0"	1'-3"	3"		22 W	FIX	LED	1	2700	120 V	0-10V	ACUITY LITHONIA LBL CURRENT COLUMBIA LAW SIGNIFY DAYBRITE OWL LED COOPER METALUX WSNLED

LIGHTING SEQUENCE OF OPERATION

NOTES:
1. {L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.

PLAN ID	LIGHTING SWITCHED
{LS1}	Sequence: Switched lights are controlled in this space. ON: The lights are turn on by occupancy sensor. OFF: After the space has been vacant for 15 minutes, the lights will automatically turn off.

DISCONNECT AND STARTER SCHEDULE

NOTE: ALL DISCONNECTS (EXCEPT MANUAL STARTERS) SHALL BE HEAVY DUTY TYPE.

DISCONNECT TYPE:	**ACCESSORIES & OPTIONS**	
FU - FUSED	SA - STANDARD ACCESSORIES (INCLUDES * ITEMS)	PF - PHASE LOSS PROTECTION (5 HP OR GREATER, 3 PHASE MOTOR)
NF - NON-FUSED	*CT - CONTROL TRANSFORMER, FUSED 120V	TO - MELTING THERMAL OVERLOADS (1 PHASE)
CB - CIRCUIT BREAKER	*EO - ELECTRONIC OVERLOAD (3 PHASE MOTORS)	TS - 2 SPEED SELECTOR SWITCH IN DOOR
	*HA - HAND-OFF-AUTO IN DOOR	GP - GREEN (OFF) PILOT LIGHT IN DOOR
STARTER TYPE:	*RP - RED (RUN) PILOT LIGHT IN DOOR	FA - 4-CONVERTIBLE AUXILIARY CONTACTS
FV - FULL VOLTAGE	*TA - TWO CONVERTIBLE AUXILIARY CONTACTS	EI - ELECTRICAL INTERLOCK (2)-N.O. & (2)-N.C.
YD - WYE - DELTA	S/N - INSULATED NEUTRAL ASSEMBLY	SS - START-STOP PUSHBUTTON IN DOOR
RE - REVERSING		HL - HANDLE PADLOCK HASP
TW - 2 SPEED, 2 WINDING		
SW - 2 SPEED, 1 WINDING		
RV - REDUCED VOLTAGE AUTOXFMR		
SS - SOLID STATE		
MS - MANUAL STARTER		
MX - MANUAL SWITCH		
FS - FUSED SWITCH		
AMS-ASSEMBLED MOTOR STARTER		

	DISCONNECT TYPE & RATING					STARTER				
ITEM	TYPE	RATING	TRIP RATING	VOLTAGE	POLES	NEMA SIZE	TYPE	ENCLOSURE	REQUIRED ACCESSORIES & OPTIONS	APPROVED MANUFACTURERS
MX-WH-1		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-1		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-4		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-2		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-3		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
DS-F-3C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-4C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-2C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-1C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF

IDAS/Ames/DOC CBC 2 AMPB
111 N SHERMAN AVE, AMES IA 50010

Horizon-Architecture

IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

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REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	**100% CD**
Date	**9/6/2024**
Project #	**24003771.00**
Drawn	**ZACROS**
Checked	**KRISPI**
Approved	**KRISPI**

SHEET TITLE

ELECTRICAL SCHEDULES

SCALE

Scale:

SHEET NUMBER

E600

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26 05 00 BASIC ELECTRICAL REQUIREMENTS

SCOPE OF WORK

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE ELECTRICAL WORK A FINISHED AND WORKING SYSTEM.

TEMPERATURE CONTROL WIRING FOR PLUMBING AND HVAC EQUIPMENT WILL BE BY OTHER CONTRACTORS.

CODES AND STANDARDS

CONFORM TO ALL REQUIREMENTS OF THE CITY OF AMES, IOWA CODES, LAWS, ORDINANCES, AND OTHER REGULATIONS HAVING JURISDICTION OVER THIS INSTALLATION.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION.

PERMITS AND FEES

PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC. OR A NATIONALLY RECOGNIZED TESTING ORGANIZATION.

DRAWINGS

THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENTS AND LOCATIONS OF EQUIPMENT, OUTLETS, ETC., AND THE APPROXIMATE SIZES OF EQUIPMENT.

CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF EQUIPMENT AND ROUGH-INS, AND THE EXACT ROUTING OF RACEWAYS SO AS TO BEST FIT THE LAYOUT OF THE JOB. CONDUIT ENTRY POINTS FOR ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, PANELBOARDS, SWITCHBOARDS, SWITCHGEAR AND UNIT SUBSTATIONS, SHALL BE DETERMINED BY THE CONTRACTOR UNLESS NOTED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

VERIFY ALL PERTINENT DIMENSIONS AT THE JOB SITE BEFORE ORDERING ANY CONDUIT, CONDUCTORS, WIREWAYS, BUS DUCT, FITTINGS, ETC.

SUBMITTALS

SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS, SUCH AS PANELBOARDS, FIRE ALARM, LIGHTING, OR MOTOR CONTROL. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

WARRANTY

PROVIDE MINIMUM ONE-YEAR WARRANTY FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION

WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE, OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

PROJECT CLOSEOUT

SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, INSPECTION AND TESTING REPORT BY THE FIRE ALARM SYSTEM MANUFACTURER.

PROVIDE CUSTOM UPDATED/NEW TYPED CIRCUIT DIRECTORY FOR EACH EXISTING/NEW BRANCH CIRCUIT PANELBOARD INCLUDED IN THE SCOPE OF WORK. LABEL SHALL INCLUDED EQUIPMENT NAME OR FINAL APPROVED ROOM NAME, ROOM NUMBER, AND LOAD TYPE FOR EACH CIRCUIT (EXAMPLES: SUMP PUMP SP-1 OR ROOM 101 RECEPT). PRINTED COPIES OF THE BID DOCUMENT PANEL SCHEDULES ARE NOT ACCEPTABLE AS CIRCUIT DIRECTORIES.

RECORD DOCUMENTS

MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF ELECTRICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS, CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS, AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING

THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

26 05 05 ELECTRICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.

WHERE WALLS, CEILINGS, STRUCTURES, ETC., ARE INDICATED AS BEING REMOVED ON GENERAL OR ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, STRUCTURES, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, STORAGE, AND REPLACEMENT OF EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING EQUIPMENT REMOVED BY OTHER TRADES AND REMOVING ALL ASSOCIATED STARTERS, CONTROLLERS, RACEWAYS, WIRING, ETC.

VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND CONDUIT AND WIRE TO FACILITIES AND EQUIPMENT THAT WILL REMAIN IN OPERATION FOLLOWING DEMOLITION. EXTENSION OF CONDUIT AND WIRE TO EQUIPMENT SHALL BE COMPATIBLE WITH THE SURROUNDING AREA. EXTENDED CONDUIT AND CONDUCTORS SHALL MATCH EXISTING SIZE AND MATERIAL.

COORDINATE SCOPE OF WORK WITH ALL OTHER CONTRACTORS AND THE OWNER AT THE PROJECT SITE. SCHEDULE REMOVAL OF EQUIPMENT AND ELECTRICAL SERVICE TO AVOID CONFLICTS.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND HAS VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION

PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS. ASSUME ALL EQUIPMENT AND SYSTEMS MUST REMAIN OPERATIONAL UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

REMOVE ABANDONED WIRING AND RACEWAY TO SOURCE OF SUPPLY. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE BY INCLUDING AN EQUIPMENT GROUND CONDUCTOR IN REUSED CONDUIT. REUSED CONDUIT AND BOXES SHALL HAVE SUPPORTS REVISED TO MEET CURRENT CODES. RELOCATING CONDUIT SHALL NOT BE ALLOWED.

REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT EMBEDDED RACEWAY FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. REMOVE ALL ASSOCIATED CLAMPS, HANGERS, SUPPORTS, ETC.

DISCONNECT AND REMOVE OUTLETS AND DEVICES THAT ARE TO BE DEMOLISHED. REMOVE CONDUIT, SUPPORTS, AND CONDUCTORS BACK TO SOURCE. BACK BOX AND CONDUIT MOUNTED IN WALLS THAT ARE TO REMAIN CAN BE ABANDONED IN PLACE. PROVIDE APPROPRIATE COVER PLATE FOR ALL ABANDONED BACK BOXES PER WIRING DEVICES SPECIFICATION.

DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. BALLASTS IN LIGHT FIXTURES INSTALLED PRIOR TO 1980 SHALL BE INCINERATED IN EPA-APPROVED INCINERATOR OR DISPOSED OF IN EPA-CERTIFIED CONTAINERS AND DEPOSITED IN AN EPA LANDFILL CERTIFIED FOR PCB DISPOSAL OR RECYCLED BY PERMITTED BALLAST RECYCLER.

HID AND FLUORESCENT LAMPS DETERMINED BY THE TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP) TO BE HAZARDOUS WASTE SHALL BE DISPOSED OF IN AN EPA-PERMITTED HAZARDOUS WASTE DISPOSAL FACILITY OR BY A PERMITTED LAMP RECYCLER.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PATCH OPENINGS TO MATCH EXISTING SURROUNDING FINISHES. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE JUNCTION BOXES AND ACCESS PANEL AS APPROPRIATE. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS.

FLOOR SLABS MAY CONTAIN CONDUIT SYSTEMS. THIS CONTRACTOR IS RESPONSIBLE FOR TAKING ANY MEASURES REQUIRED TO ENSURE NO CONDUITS OR OTHER SERVICES ARE DAMAGED. THIS INCLUDES X-RAY OR SIMILAR NON-DESTRUCTIVE MEANS. WHERE CONDUIT IS IN CONCRETE SLAB, CUT CONDUIT FLUSH WITH FLOOR, PULL OUT CONDUCTORS, AND PLUG CONDUIT ENDS.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT THAT REMAIN OR ARE TO BE REUSED.

ELECTRICAL ITEMS REMOVED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER ABANDONS.

26 05 13 WIRE AND CABLE

FEEDERS AND BRANCH CIRCUITS 8 AWG AND LARGER SHALL BE COPPER, STRANDED, 600 VOLT INSULATION, THHN.

FEEDERS AND BRANCH CIRCUITS 10 AWG AND SMALLER; COPPER, SOLID OR STRANDED, 600 VOLT INSULATION, THHN/THWN. NOTED ON THE DRAWINGS. MINIMUM SIZE #12 AWG.

METAL CLAD CABLE (MC) SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH UL STANDARD FOR TYPE MC CABLES, UL 4, EXTERIOR OF METAL INTERLOCKED ARMOR.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING AND SIZING CONDUCTORS AND CONDUITS TO EQUAL OR EXCEED THE AMPACITY OF NEC TABLE B.310.15(B)(2)(7), IF METHODS OR MATERIALS OTHER THAN THE BASIS OF DESIGN ARE USED.

USE # 10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 75 FEET.

ALL WIRES IN OUTLET BOXES NOT CONNECTED TO FIXTURES OR OTHER DEVICES SHALL BE ROLLED UP, SPLICED IF CONTINUITY OF CIRCUIT IS REQUIRED, AND INSULATED.

OPEN CABLE SHALL BE SUPPORTED BY THE APPROPRIATE SIZE BRIDLE RINGS OR OTHER MEANS IF CALLED FOR ON THE DRAWINGS. WIRE AND CABLE FROM DIFFERENT SYSTEMS SHALL NOT BE INSTALLED IN THE SAME BRIDLE RINGS. BRIDLE RING SUPPORTS SHALL BE INSTALLED AT A MINIMUM OF FIVE FOOT (5') INTERVALS.

OPEN CABLE INSTALLED ABOVE SUSPENDED CEILINGS SHALL NOT REST ON THE SUSPENDED CEILING CONSTRUCTION, NOR UTILIZE THE CEILING SUPPORT SYSTEM FOR WIRE AND CABLE SUPPORT. SPLICE AND TAP ONLY IN ACCESSIBLE JUNCTION BOXES.

USE SOLDERLESS, TIN-PLATED COPPER LUGS APPLIED WITH CIRCUMFERENTIAL CRIMP FOR COPPER TERMINATIONS #8 AWG AND LARGER. USE INDENTER CRIMP #10 AWG AND SMALLER.

AC/MC CABLE SHALL BE SUPPORTED BY AN APPROVED MEANS EVERY 4.5' AND WITHIN 12" OF OUTLET BOXES, JUNCTION BOXES, CABINETS, OR FITTINGS.

TEST WIRE AND CABLE INSULATION WITH DEVICE SUCH AS A "MEGGER", USING NOT LESS THAN 500 VOLTS D.C. TEST POTENTIAL.

26 05 26 GROUNDING AND BONDING

COMPLY WITH UL 467 GROUNDING AND BONDING EQUIPMENT.

CONDUCTORS SHALL BE COPPER IN ACCORDANCE WITH 26 05 13.

CONNECTORS SHALL BE HYDRAULIC COMPRESSION TYPE.

EQUIPMENT GROUNDING

INSTALL EQUIPMENT GROUNDING CONDUCTORS IN ALL FEEDERS AND CIRCUITS.

EQUIPMENT GROUNDING CONDUCTORS: INSULATED WITH GREEN-COLORED INSULATION.

FIELD QUALITY CONTROL

PROVIDE GROUND TESTING IN ACCORDANCE WITH IEEE STANDARDS.

26 05 27 SUPPORTING DEVICES

APPROVED MANUFACTURERS: ALLIED, COOPER B-LINE, ERICO, HILTI, POWER FASTENERS.

SUPPORT CHANNELS SHALL BE PAINTED STEEL. PROVIDE GALVANIZED STEEL FOR WET/DAMP LOCATIONS. ALL HARDWARE TO BE CORROSION RESISTANT.

ANCHORS AND STRUCTURAL COMPONENTS

SUPPORTS SHALL HAVE STRUCTURAL SAFETY FACTOR STRENGTH OF TWICE THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED. THROUGH BOLTS SHALL COMPLY WITH ASTM A 325. WELDING LUGS SHALL COMPLY WITH MSS-SP-69, TYPE 57.

BEAM CLAMPS FOR STRUCTURAL STEEL SHALL BE DOUBLE SIDED.

FASTEN CONCRETE ANCHORS PER THE REQUIREMENTS OF APPENDIX D OF ACI 318-11.

FASTEN MASONRY ANCHORS WITH EXPANSION ANCHORS OR SELF-TAPPING MASONRY SCREWS.

DO NOT EXCEED 25 LBS. PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING.

26 05 33 CONDUIT AND BOXES

CONDUIT

ACCEPTABLE CONDUIT MANUFACTURERS: ALLIED, LTV, STEELDUCT, WHEATLAND TUBE CO, O-Z GEDNEY.

ACCEPTABLE FITTINGS MANUFACTURERS: APPLETON ELECTRIC, O-Z GEDNEY, ELECTROLINE, RACO, BRIDGEPORT, MIDWEST, REGAL, THOMAS & BETTS, CROUSE-HINDS, KILLARK

ELECTRICAL METALLIC TUBING (EMT), MINIMUM 3/4" SHALL BE USED IN FINISHED SPACES FOR ALL BRANCH CIRCUITS.

RIGID METALLIC CONDUIT (RMC) SHALL BE USED IN WET OR DAMP LOCATIONS.

FLEXIBLE METALLIC CONDUIT (FMC) SHALL BE USED FOR CONNECTIONS TO MOTORS AND LIGHT FIXTURES.

EMT CONDUIT FITTINGS SHALL BE STEEL SET-SCREW TYPE.

CONDUIT AND CONDUCTOR SIZING SHALL BE COORDINATED TO LIMIT CONDUCTOR FILL TO LESS THAN 40%, MAINTAIN CONDUCTOR AMPERE CAPACITY AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

CONDUIT SHALL NOT CONTAIN MORE FOUR (4) QUARTER BENDS (360°) BETWEEN PULL BOX POINTS.

ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS. WHERE CONDUIT PENETRATES FIREWALLS AND FLOORS, SEAL WITH A UL LISTED SEALANT. SEAL INTERIOR OF CONDUIT AT EXTERIOR ENTRIES.

EXPOSED CONDUIT ON EXTERIOR WALLS OR ABOVE ROOF WILL NOT BE ALLOWED.

BOXES

OUTLET BOXES FOR LUMINAIRES TO BE MINIMUM 1-1/2" DEEP.

LIGHT CONTROL SWITCHES, DIMMERS AND OCCUPANCY SENSOR BOXES SHALL BE 4 INCHES SQUARE BY 2-1/8 INCHES DEEP.

MULTIPLE GANG SWITCH OUTLETS SHALL CONSIST OF THE REQUIRED NUMBER OF GANG BOXES APPROPRIATE TO THE QUANTITY OF SWITCHES COMPRISING THE GANG. PROVIDE PLASTER RINGS AND COVERS AS NEEDED.

RECEPTACLE OUTLET BOXES SHALL BE 4 INCHES SQUARE WITH RAISED COVER TO FIT FLUSH WITH FINISHED WALL LINE.

GALVANIZED STEEL BOXES MAY BE USED IN CONCEALED OR EXPOSED INTERIOR LOCATIONS, ABOVE CEILINGS, AND MIN. RECESSED STUDDED PARTITIONS.

CAST BOXES SHALL BE USED IN EXTERIOR LOCATIONS, HAZARDOUS LOCATIONS, WET LOCATIONS, CONCRETE SLAB ON GRADE.

[ECONN]: ELECTRICAL CONNECTION TO EQUIPMENT AND MOTORS, SIZED PER NEC.

26 05 53 ELECTRICAL IDENTIFICATION

COLORED ADHESIVE MARKING TAPE FOR BANDING RACEWAYS, WIRES, AND CABLES: 3 MILS THICK BY 2" WIDTH.

PRETENSIONED FLEXIBLE WRAPAROUND COLORED PLASTIC SLEEVES FOR CABLE IDENTIFICATION.

WIRE/CABLE DESIGNATION TAPE MARKERS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND, WITH PREPRINTED NUMBERS AND LETTER.

CABLE TIES: NYLON, 0.18" WIDTH, 50-LB MINIMUM TENSILE STRENGTH.

ALUMINUM, WRAPAROUND MARKER BANDS: 1" WIDTH, 0.014 INCH THICK ALUMINUM BANDS WITH STAMPED OR EMBOSSED LEGEND, AND FITTED WITH SLOTS OR EARS FOR PERMANENTLY SECURING AROUND WIRE OR CABLE JACKET OR AROUND GROUPS OF CONDUCTORS.

ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS AND INSTRUCTION PLATES: BLACK LETTERS ON WHITE FACE FOR NORMAL POWER.

SAFETY SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145.

JUNCTION, PULL AND CONNECTION BOXES: 3/8-INCH KROY TAPE.

COVER PLATES FOR RECEPTACLES: INDICATE SOURCE AND CIRCUIT NUMBER SERVING THE DEVICE: 3/8-INCH KROY TAPE OR BROTHER SELF-LAMINATING VINYL LABEL WITH BLACK LETTERS.

26 27 26 WIRING DEVICES

ALL SWITCH, RECEPTACLE, OUTLET, AND COVERPLATE COLORS SHALL BE WHITE, VERIFIED WITH ARCHITECT, UNLESS INDICATED OTHERWISE.

ALL SWITCHES, RECEPTACLES, AND OUTLET FACEPLATES SHALL BE COMPLETE WITH UNBREAKABLE THERMOPLASTIC COVERPLATES IN FINISHED SPACES WHERE WALLS ARE FINISHED. PROVIDE #302 STAINLESS STEEL COVERPLATES IN UNFINISHED SPACES FOR FLUSH BOXES.

INSTALL RECEPTACLES VERTICALLY WITH GROUND SLOT UP.

TEST RECEPTACLES FOR PROPER POLARITY, GROUND CONTINUITY, AND COMPLIANCE WITH REQUIREMENTS.

RECEPTACLES

[REC-DUP]: NEMA 5-20R DUPLEX RECEPTACLE: HUBBELL 5352A, LEVITON, 5362-S, PASS & SEYMOUR 5362, COOPER 5352.

[REC-DUP-GFI]: NEMA 5-20R GROUND FAULT DUPLEX RECEPTACLE: HUBBELL GF20L, LEVITON GFNT2, PASS & SEYMOUR 2097, COOPER SGF20.

[REC-SIM-1430R]: NEMA 14-30R SIMPLEX RECEPTACLE: HUBBELL HBL9430A, LEVITON 278, PASS & SEYMOUR 3864, COOPER 5744N.

26 28 16 DISCONNECT SWITCHES

ACCEPTABLE MANUFACTURERS: SQUARE D 3110 SERIES, EATON DH SERIES, ABB TH SERIES, SIEMENS HNF / HF SERIES

[DS-#]: NON-FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION.

SECTION 26 09 33 LIGHTING CONTROL SYSTEMS

SYSTEM DESCRIPTION

PERFORMANCE STATEMENT: THE SPECIFICATION SECTION AND LIGHTING DESIGN DOCUMENTS DESCRIBE THE MINIMUM MATERIAL QUALITY, REQUIRED FEATURES, AND OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM. THE DOCUMENTS DO NOT CONVEY EVERY COMPONENT, RELAY, WIRE, AND EQUIPMENT CONNECTION REQUIRED. THE CONTRACTOR AND LIGHTING CONTROL MANUFACTURER/VENDOR ARE SOLELY RESPONSIBLE FOR DETERMINING ALL SYSTEM COMPONENTS, WIRING, AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM BASED ON THE PERFORMANCE BASED REQUIREMENTS OF THE DOCUMENTS.

LIGHTING SEQUENCE OF OPERATION (SOO): THE SEQUENCE OF OPERATION (SOO) DESCRIBES THE REQUIRED LIGHTING CONTROL OPERATION AND PERFORMANCE IN EACH SPACE.

DRAWINGS: THE DRAWINGS INCLUDE THE SEQUENCE OF OPERATION (SOO), LUMINAIRE SCHEDULE, LOCATION OF CONTROL DEVICES, SENSORS, AND IDENTIFICATION OF CONTROL ZONES, AND BRANCH POWER CIRCUITING. CONTROL WIRING AND MANUFACTURER/VENDOR SPECIFIC COMPONENTS ARE NOT SHOWN, BUT SHALL BE SUBMITTED WITH THE SHOP DRAWING SUBMITTALS.

LIGHTING CONTROL OVERVIEW

LIGHTING CONTROL SYSTEM: AS DEFINED IN THE SYSTEM DESCRIPTION, THE DESIGN DOCUMENTS DESCRIBE THE OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM.

ALL SYSTEM COMPONENTS AND MATERIALS OF SIMILAR FUNCTION (E.G., SWITCHES, DIMMERS, SENSORS, CONTACTORS, RELAYS, ETC.) SHALL BE OF THE SAME MANUFACTURER, UNLESS SPECIFICALLY STATED OTHERWISE ON DRAWINGS OR ELSEWHERE IN THE SPECIFICATIONS. LIGHTING CONTROL SWITCHES, SYSTEMS, AND COMPONENTS SHALL BE LISTED.

DEVICE COLOR AND COVERPLATES

ALL SWITCHES AND LIGHTING CONTROLS SHALL BE COMPLETE WITH COVERPLATES THAT MATCH MATERIAL AND COLOR OF THE WIRING DEVICE COVERPLATES IN THE SPACE. WHEN THE COVERPLATE IS PROPRIETARY TO THE DEVICE MANUFACTURER AND DO NOT MATCH THE WIRING DEVICE COVERPLATES, THE ARCHITECT SHALL SELECT THE COVERPLATE COLOR AND MATERIALS FROM THE STANDARD COVERPLATE OPTIONS.

WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.

STANDALONE LINE AND LOW VOLTAGE LIGHTING CONTROLS

OVERVIEW: WALL SWITCHES AND WALL DIMMERS: UL LISTED WITH INTEGRAL AIR-GAP SWITCH FOR ON/OFF CONTROL, INTEGRAL EMI/RFI SUPPRESSION, NON-VIEWABLE HEAT SINK, DIMMER TO MATCH DEVICE COLOR, DIMMER COMPATIBILITY AND WIRING WITH THE LOAD BEING CONTROLLED SHALL BE VERIFIED BY CONTRACTOR PRIOR TO PURCHASE AND INSTALLATION.

SW-O: DUAL TECHNOLOGY OCCUPANCY SENSOR WITH WALL SWITCH (STANDALONE): WALL SWITCH WITH MANUAL ON/AUTO/OFF. 120/277 VAC LOAD RATING OF 0-800 W FOR LED. 5-, 15-, 20-MINUTE ADJUSTABLE OFF DELAY. DUAL TECHNOLOGY ULTRASONIC AND PIR COVERAGE OF MINOR MOTION IN 12' X 15' PATTERN AND OCCUPANCY DETECTION IN AREA BASED ON HALF-STEP WALKING MOTION. SENSITIVITY ADJUSTMENTS SEPARATE FOR EACH SENSING TECHNOLOGY. MANUFACTURERS: WATT STOPPER DW-100 SERIES, HUBBELL LHMTS, LEVITON OSSMT SERIES, SENSOR SWITCH WSX-PDT SA SERIES.

SW-OC-#: OCCUPANCY / VACANCY SENSORS (STANDALONE): COMBINATION DEVICES: SUBSCRIPTS IDENTIFY COMBINATION TYPE DEVICES WHEN APPLICABLE. THE CONTRACTOR SHALL PROVIDE THE COMBINATION DEVICE OR PROVIDE MULTIPLE DEVICE(S) TO MEET THE FUNCTIONALITY WHEN THE MANUFACTURER DOES NOT OFFER THE REQUIRED FUNCTIONALITY WITH A SINGLE DEVICE.

GENERAL DESCRIPTION: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE POWER SUPPLY/RELAY UNIT. OPERATION - OCCUPANCY: OCCUPANCY SENSORS TURN LIGHTS 'ON' WHEN COVERED AREA IS OCCUPIED AND TURN LIGHTS 'OFF' WITH A TIME DELAY WHEN UNOCCUPIED, UNLESS OTHERWISE INDICATED. TIME DELAY 'OFF': FIELD ADJUSTABLE WITH A MINIMUM RANGE OF 1-20 MINUTES. SENSOR OUTPUT: CONTACTS RATED TO OPERATE THE CONNECTED RELAY, COMPLYING WITH UL 773A. SENSOR SHALL BE POWERED FROM THE RELAY UNIT. POWER SUPPLY TO SENSOR SHALL BE 24 V DC, 150-MA, CLASS 2 POWER SOURCE AS DEFINED BY ELECTRICAL CODE. MOUNTING: SENSOR: SUITABLE FOR MOUNTING IN ANY POSITION ON A STANDARD OUTLET BOX. RELAY: EXTERNALLY MOUNTED THROUGH A 1/2-INCH KNOCKOUT IN A STANDARD ELECTRICAL ENCLOSURE. MOUNT RELAY ABOVE ACCESSIBLE CEILING NEAR ENTRY DOOR TO ROOM OR AREA. TIME DELAY AND SENSITIVITY ADJUSTMENTS: RECESSED AND CONCEALED. INDICATOR: LED TO SHOW WHEN MOTION IS BEING DETECTED DURING TESTING AND NORMAL OPERATION OF THE SENSOR. BYPASS SWITCH: OVERRIDE THE ON FUNCTION IN CASE OF SENSOR FAILURE. POWER SUPPLY AND CHILD PACKS: PROVIDE AS REQUIRED FOR SENSOR QUANTITY AND SWITCHING SCHEME. MOUNT TO STANDARD 1/2" KNOCKOUT ON ELECTRICAL BOX ABOVE ACCESSIBLE CEILING NEAR ENTRY DOOR TO ROOM OR AREA.

(A): ULTRASONIC TWO-SIDED CORRIDOR COVERAGE OCCUPANCY/VACANCY SENSOR: FREQUENCY GREATER THAN 32 KHZ SOLID STATE. ADJUSTABLE SENSITIVITY AND TIME DELAY, TEMPERATURE AND HUMIDITY RESISTANT RECEIVERS. SENSOR SHALL CONTROL ALL CIRCUITS IN AREA, UNLESS NOTED OTHERWISE. MANUFACTURERS: WATT STOPPER WT-2250 SERIES, HUBBELL OMNI-US OR ATU SERIES, GREENGATE ODC-U SERIES.

INSTALLATION

INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SHOP DRAWINGS.

ALL WIRING SHALL BE INSTALLED IN CONDUIT.

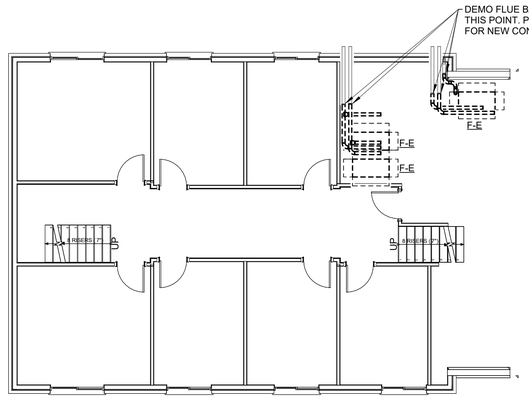
ALL BRANCH LOAD CIRCUITS SHALL BE LIVE TESTED BEFORE CONNECTING THE LOADS TO THE LIGHTING CONTROL PANEL.

26 51 19 LIGHTING

DELIVER PRODUCTS TO SITE. PROTECT LUMINAIRE FINISHES, LENSES, AND TRIMS FROM DAMAGE DURING STORAGE AND INSTALLATION. DO NOT REMOVE PROTECTIVE FILMS UNTIL CONSTRUCTION CLEANUP WITHIN EACH AREA IS COMPLETE.

THE WARRANTY PERIOD BEGINS AT THE DATE OF SUBSTANTIAL COMPLETION. PROVIDE LED LIGHT ENGINES AND DRIVERS WITH A FIVE (5) YEAR WARRANTY.

LIGHT EMITTING DIODES USED IN INTERIOR APPLICATIONS SHALL HAVE A MINIMUM CO

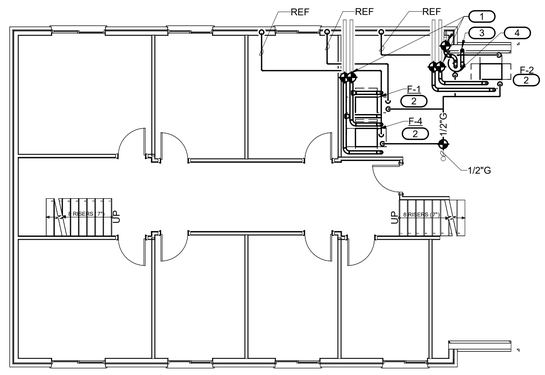


1 BASEMENT DEMOLITION PLAN - HVAC

1/8" = 1'-0"

KEYNOTES:

1. M.C. TO CONFIRM THE EXISTING FLUE/INTAKE PIPE SIZES CAN SUPPORT NEW MBH CAPACITES.
2. M.C. TO DISCONNECT AND RECONNECT GAS PIPING.
3. M.C. SHALL ROUTE NEW FURNACE FLUE PIPE UP THROUGH WALL AND EXIT THE BUILDING WITH A ROOF PENETRATION.
4. M.C. SHALL CONNECT EXISTING HOT AND COLD WATER CONNECTIONS TO NEW FURNACE.



2 BASEMENT PLAN - HVAC

1/8" = 1'-0"

IDAS/Ames/DOC CBC 2 AMPB
111 N SHERMAN AVE, AMES IA 50010

Horizon-Architecture

IMEG
The FUTURE. Built Smarter. www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	PARPOL

SHEET TITLE

BASEMENT PLAN - HVAC

SCALE

Scale: 1/8" = 1'-0"

SHEET NUMBER

M200

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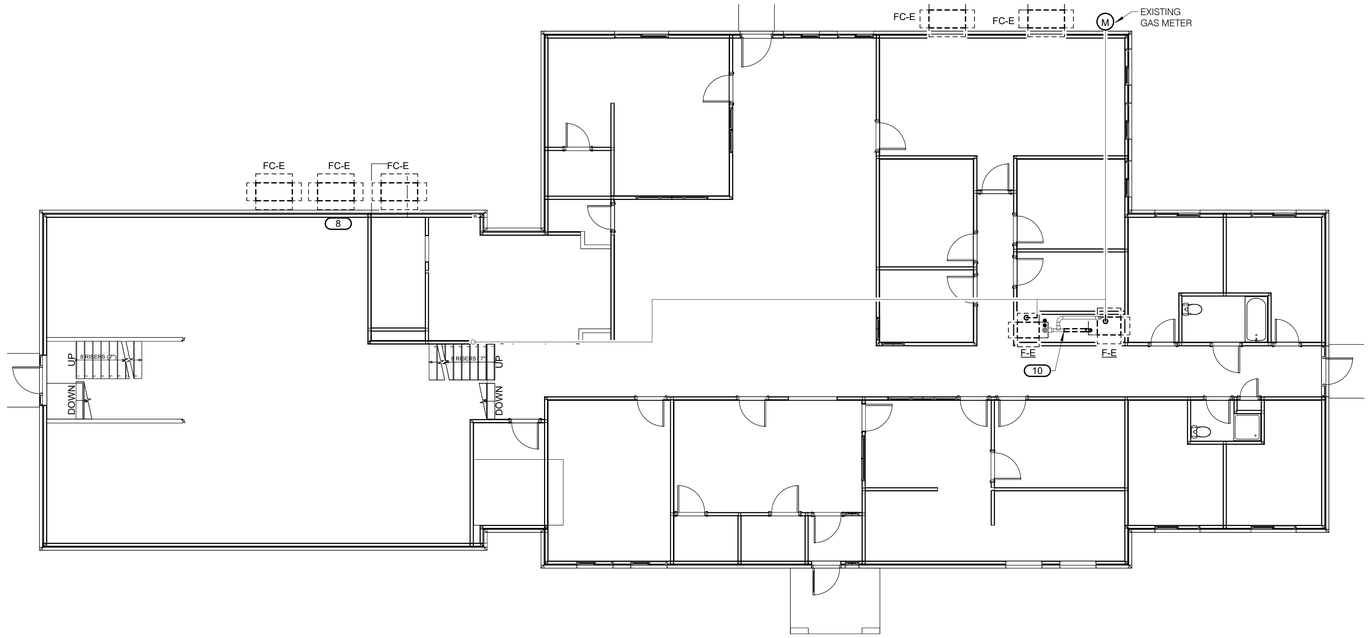
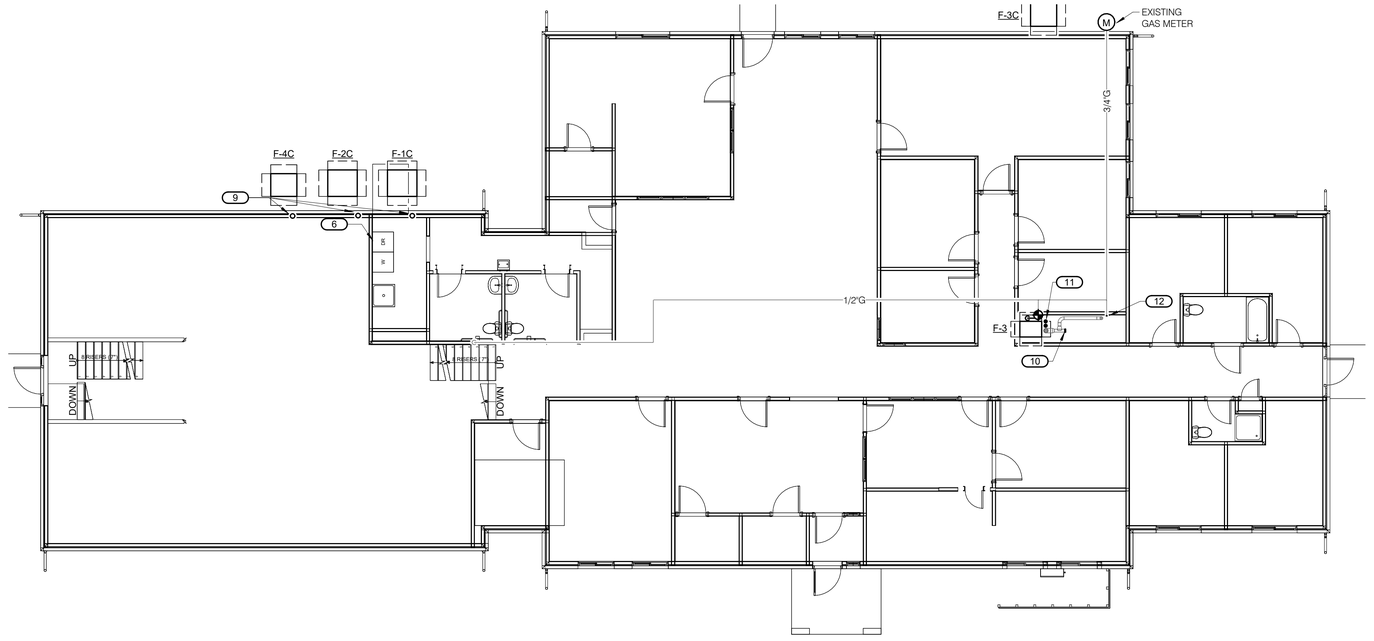


NORTH 1 **LEVEL 01 DEMOLITION PLAN - HVAC**

1/8" = 1'-0"

KEYNOTES:

1. NOT USED
2. NOT USED
3. NOT USED
4. NOT USED
5. NOT USED
6. M.C. TO INSTALL 4" FLEX EXHAUST TO DRYER. DUCT SHALL PENETRATE OUT NORTH WALL AND TERMINATE WITH WALL MOUNTED RAIN CAP.
7. NOT USED
8. M.C. SHALL DEMOLISH EXISTING FURNACE REFRIGERANT LINES. PREPARE TO ROUTE NEW REFRIGERANT LINES IN SAME LOCATION.
9. M.C. SHALL VERIFY AND RESUSE EXISTING REFRIGERANT LINE PENETRATIONS.
10. M.C. SHALL DEMO AND CAP EXISTING FURNACE FLUE PIPE BACK TO THIS POINT.
11. M.C. SHALL REUSE ROOF PENETRATIONS FOR FURNACE FLUE PIPE.
12. M.C. SHALL DEMO AND CAP EXISTING FURNACE GAS CONNECTION BACK TO THIS POINT.



NORTH 2 **LEVEL 01 PLAN - HVAC**

1/8" = 1'-0"

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2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	PARPOL

SHEET TITLE
LEVEL 01 PLAN - HVAC

SCALE
Scale: 1/8" = 1'-0"

SHEET NUMBER
M201

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22 05 00 BASIC MECHANICAL REQUIREMENTS

SCOPE OF WORK
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE MECHANICAL WORK A FINISHED AND WORKING SYSTEM.

PLUMBING WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. FURNISH AND INSTALL ALL ITEMS LISTED IN THE PLUMBING MATERIAL LIST.
2. EXTEND EXISTING DOMESTIC WATER PIPING SYSTEM INCLUDING COLD, HOT, AND HOT WATER CIRCULATING PIPING WITHIN THE BUILDING. INSULATE ALL PIPING AS SPECIFIED.
3. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
4. REVISE AND/OR REPLACE WATER HEATERS.
5. EXTEND EXISTING SANITARY SEWER AND VENT SYSTEM.
6. FURNISH AND INSTALL SITE SANITARY SEWER PIPING, CLEANOUTS, AND MANHOLES.

HVAC WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
2. FURNISH AND INSTALL REFRIGERANT PIPING, ACCESSORIES, AND FINAL CHARGE OF REFRIGERANT.
3. FURNISH AND INSTALL CONDENSATE DRAIN PIPING FROM COOLING RELATED EQUIPMENT SUCH AS AIR HANDLERS AND COOLING COIL DRAIN PANS.
4. FURNISH AND INSTALL COMPLETE EXHAUST DUCTWORK SYSTEMS INCLUDING ALL FITTINGS, INSULATION, INLETS, AND FANS.
5. FURNISH AND INSTALL GAS FLUES, STACKS, AND BREECHINGS.
6. FURNISH AND INSTALL ALL TEMPERATURE CONTROL SYSTEMS.

ALL WORK THAT WILL PRODUCE EXCESSIVE NOISE OR INTERFERENCE WITH NORMAL BUILDING OPERATIONS, AS DETERMINED BY THE OWNER/LANDLORD, SHALL BE SCHEDULED WITH THE OWNER/LANDLORD. IT MAY BE NECESSARY TO SCHEDULE SUCH WORK DURING UNOCCUPIED HOURS. THE OWNER/LANDLORD RESERVES THE RIGHT TO DETERMINE WHEN RESTRICTED CONSTRUCTION HOURS WILL BE REQUIRED. CONTRACTOR SHALL COORDINATE WITH THE LANDLORD DURING THE BIDDING PROCESS.

ALL CONTRACTORS SHALL ESTABLISH UTILITY ELEVATIONS PRIOR TO FABRICATION AND SHALL COORDINATE THEIR MATERIAL AND EQUIPMENT WITH OTHER TRADES.

THE MECHANICAL CONTRACTOR (FIRE PROTECTION/PLUMBING/HVAC/TEMPERATURE CONTROLS CONTRACTOR) SHALL:

BE RESPONSIBLE FOR ALL WIRING NOT SHOWN ON ELECTRICAL DRAWINGS BUT REQUIRED FOR MECHANICAL SYSTEMS.

VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE UNITS ARE TO BE MODIFIED, MOVED, OR REPLACED. CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING NEW UNITS OR REPLACEMENT UNITS.

QUALITY ASSURANCE
THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING COMPLETE AND OPERATING SYSTEMS. THE CONTRACTOR ACKNOWLEDGES AND UNDERSTANDS THAT THE CONTRACT DOCUMENTS ARE A TWO-DIMENSIONAL REPRESENTATION OF A THREE-DIMENSIONAL OBJECT, SUBJECT TO HUMAN INTERPRETATION. THIS REPRESENTATION MAY INCLUDE IMPERFECT DATA, INTERPRETED CODES, UTILITY GUIDELINES, THREE-DIMENSIONAL CONFLICTS, AND REQUIRED FIELD COORDINATION ITEMS. SUCH DEFICIENCIES CAN BE CORRECTED WHEN IDENTIFIED PRIOR TO ORDERING MATERIAL AND STARTING INSTALLATION. THE CONTRACTOR AGREES TO CAREFULLY STUDY AND COMPARE THE INDIVIDUAL CONTRACT DOCUMENTS AND REPORT AT ONCE IN WRITING TO THE DESIGN TEAM ANY DEFICIENCIES THE CONTRACTOR MAY DISCOVER. THE CONTRACTOR FURTHER AGREES TO REQUIRE EACH SUBCONTRACTOR TO LIKEWISE STUDY THE DOCUMENTS AND REPORT AT ONCE ANY DEFICIENCIES DISCOVERED.

THE CONTRACTOR SHALL RESOLVE ALL REPORTED DEFICIENCIES WITH THE ARCHITECT/ENGINEER PRIOR TO AWARDING ANY SUBCONTRACTS, ORDERING MATERIAL, OR STARTING ANY WORK WITH THE CONTRACTOR'S OWN EMPLOYEES. ANY WORK PERFORMED PRIOR TO RECEIPT OF INSTRUCTIONS FROM THE DESIGN TEAM WILL BE DONE AT THE CONTRACTOR'S RISK.

ONLY PRODUCTS OF REPUTABLE MANUFACTURERS ARE ACCEPTABLE.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL EMPLOY ONLY WORKERS SKILLED IN THEIR TRADES.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

CODES AND STANDARDS
CONFORM TO ALL REQUIREMENTS OF THE CITY OF AMES CODES, LAWS, ORDINANCES AND OTHER REGULATIONS HAVING JURISDICTION.

CONFORM TO ALL STATE CODES.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION. IF THERE IS INSUFFICIENT TIME FOR THIS PROCEDURE, CONTRACTOR SHALL SUBMIT WITH THE PROPOSAL A SEPARATE PRICE TO MAKE THE SYSTEM COMPLY WITH THE CODES AND REGULATIONS.

ALL CHANGES TO THE SYSTEM MADE AFTER LETTING OF THE CONTRACT, TO COMPLY WITH CODES OR REQUIREMENTS OF INSPECTORS, SHALL BE MADE BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

IF THERE IS A DISCREPANCY BETWEEN MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS, THE MANUFACTURER'S RECOMMENDATIONS SHALL GOVERN.

ALL ROTATING SHAFTS AND/OR EQUIPMENT SHALL BE COMPLETELY GUARDED FROM ALL CONTACT. PARTIAL GUARDS AND/OR GUARDS THAT DO NOT MEET ALL APPLICABLE OSHA STANDARDS ARE NOT ACCEPTABLE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING THIS GUARDING IF IT IS NOT PROVIDED WITH THE EQUIPMENT SUPPLIED.

PERMITS AND FEES
PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE APPROVED OR LISTED BY UNDERWRITER'S LABORATORIES, INC.

23 05 00 BASIC MECHANICAL REQUIREMENTS (CONT.)

SUBMITTALS
SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

1. SUBMITTALS LIST:

23 07 19	PLUMBING AND HVAC PIPING INSULATION
23 10 23	NATURAL GAS AND PROPANE PIPING
23 54 00	FORCED AIR FURNACES
23 81 26	SPLIT SYSTEM AIR CONDITIONING UNITS

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS BASED ON APPLICABLE SPECIFICATION SECTION. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

PRODUCT DELIVERY, STORAGE, AND HANDLING
EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO MATERIALS. STORE MATERIALS ON THE SITE TO PREVENT DAMAGE. KEEP MATERIALS CLEAN, DRY AND FREE FROM HARMFUL CONDITIONS. IMMEDIATELY REMOVE ANY MATERIALS THAT BECOME WET OR THAT ARE SUSPECTED OF BECOMING CONTAMINATED WITH MOLD OR OTHER ORGANISMS.

KEEP ALL BEARINGS PROPERLY LUBRICATED AND ALL BELTS PROPERLY TENSIONED AND ALIGNED.

COORDINATE THE INSTALLATION OF HEAVY AND LARGE EQUIPMENT WITH THE GENERAL CONTRACTOR AND/OR OWNER. IF THE MECHANICAL CONTRACTOR DOES NOT HAVE PRIOR DOCUMENTED EXPERIENCE IN RIGGING AND LIFTING SIMILAR EQUIPMENT, HE/SHE SHALL CONTRACT WITH A QUALIFIED LIFTING AND RIGGING SERVICE THAT HAS SIMILAR DOCUMENTED EXPERIENCE. FOLLOW ALL EQUIPMENT LIFTING AND SUPPORT GUIDELINES FOR HANDLING AND MOVING.

CONTRACTOR IS RESPONSIBLE FOR MOVING EQUIPMENT INTO THE BUILDING AND/OR SITE. CONTRACTOR SHALL REVIEW SITE PRIOR TO BID FOR PATH LOCATION AND ANY REQUIRED BUILDING MODIFICATIONS TO ALLOW MOVEMENT OF EQUIPMENT. CONTRACTOR SHALL COORDINATE HIS/HER WORK WITH OTHER TRADES.

WARRANTY
PROVIDE MINIMUM ONE-YEAR WARRANTY COMMENCING ON DATE OF FINAL ACCEPTANCE FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. WARRANTY REQUIREMENTS SHALL EXTEND TO CORRECTION, WITHOUT COST TO OWNER, OF ALL WORK FOUND TO BE DEFECTIVE OR NONCONFORMING TO THE CONTRACT DOCUMENTS. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION
WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

OBSERVATION OF WORK
THE CONTRACTOR SHALL PROVIDE SEVEN (7) CALENDAR DAYS' NOTICE TO THE ARCHITECT/ENGINEER PRIOR TO COVERING INTERIOR PARTITIONS AND CHASES AND INSTALLING HARD OR SUSPENDED CEILINGS AND SOFFITS.

ALL WORK ABOVE THE CEILINGS MUST BE COMPLETE PRIOR TO THE ARCHITECT/ENGINEER'S REVIEW. THIS INCLUDES, BUT IS NOT LIMITED TO:
1. PIPE INSULATION IS INSTALLED AND FULLY SEALED.
2. PIPE WALL PENETRATIONS ARE SEALED.
3. PIPE IDENTIFICATION AND VALVE TAGS ARE INSTALLED.

IN ORDER TO PREVENT THE FINAL JOBSITE OBSERVATION FROM OCCURRING TOO EARLY, THE CONTRACTOR SHALL REVIEW THE COMPLETION STATUS OF THE PROJECT AND CERTIFY IN WRITING THAT THE JOB IS READY FOR THE FINAL JOBSITE OBSERVATION.

PROJECT CLOSEOUT
SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS INCLUDING REPRODUCIBLE DRAWINGS COMPLETED IN REVIT, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, AND INSPECTION BY STATE BOILER INSPECTOR.

OPERATION AND MAINTENANCE MANUALS
SUBMIT AN ELECTRONIC COPY OF THE O&M MANUALS TO THE OWNER. OPERATION AND MAINTENANCE DATA SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR THE CARE, MAINTENANCE, AND OPERATION OF THE EQUIPMENT AND SYSTEMS. INSTRUCTION BOOKS, CARDS, MANUALS FURNISHED WITH THE EQUIPMENT SHALL BE INCLUDED.

ALL TEXT SHALL BE SEARCHABLE AND BOOKMARKS SHALL BE USED, DIVIDING INFORMATION BY SPECIFICATION SECTION.

RECORD DOCUMENTS
MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS; CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB, AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING
THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

END OF SECTION

SECTION 23 10 23 NATURAL GAS AND PROPANE PIPING

SECTION INCLUDES
PIPE AND PIPE FITTINGS
VALVES
NATURAL GAS PIPING SYSTEM

QUALITY ASSURANCE
VALVES: MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY. REMANUFACTURED VALVES ARE NOT ACCEPTABLE.

WELDING MATERIALS, PROCEDURES, AND OPERATORS: CONFORM TO ASME SECTION 9, ANSI/AWS D1.1, AND APPLICABLE STATE LABOR REGULATIONS.

WELDERS CERTIFICATION: IN ACCORDANCE WITH ANSI/ASME SEC 9 OR ANSI/AWS D1.1.

DESIGN HANGERS AND SUPPORTS UNDER DIRECT SUPERVISION OF PROFESSIONAL ENGINEER EXPERIENCED IN DESIGN OF THIS WORK AND LICENSED IN STATE OF CALIFORNIA. [SPECIFIER: CALIFORNIA PROJECTS]

SUBMITTALS
SUBMIT PRODUCT DATA UNDER PROVISIONS OF SECTION 22 05 00. INCLUDE DATA ON PIPE MATERIALS, FITTINGS, VALVES, AND ACCESSORIES.

TEST REPORTS: PROVIDE RESULTS OF PIPING SYSTEM PRESSURE TEST.

WELDERS CERTIFICATES: CERTIFY WELDERS EMPLOYED ON THE WORK, VERIFYING AWS QUALIFICATION WITHIN PREVIOUS 12 MONTHS.

NATURAL GAS (0 TO 125 PSI)
DESIGN PRESSURE: 125 PSI.
MAXIMUM DESIGN TEMPERATURE: 350ºF

PIPING - 2" AND UNDER:
1. PIPE: STANDARD WEIGHT STEEL, THREADED AND COUPLED, ASTM A53.
2. JOINTS: SCREWED. (NOTE: FOR BELOW GROUND, ALL SIZES TO HAVE WELDED JOINTS.)
3. FITTINGS: 150# STEAM - 300# CWP, BLACK MALLEABLE IRON, BANDED, ASTM A197, ANSI B16.3.
4. UNIONS: 250# - 500# CWP, BLACK MALLEABLE IRON, ANSI B16.39, GROUND JOINT WITH BRASS SEAT.

PIPING – 2" AND UNDER:
1. PIPE: CORRUGATED STAINLESS STEEL TUBING, ASTM A240 SERIES 300 STAINLESS STEEL, ANSI AGA-LC1.
2. JACKET: POLYETHYLENE.
3. FITTINGS: BRASS WITH MECHANICAL ENDS TO FIT TUBING. ASME B1.20.1 THREADED ENDS FOR CONNECTIONS TO THREADED PIPES AND COMPONENTS.
4. STRIKER PLATES: MINIMUM 16 GAUGE HARDENED STEEL, CORROSION RESISTANT, PRIMED AND ZINC COATED. INSTALL TO PROTECT TUBING FROM PENETRATIONS.
5. LIMITS: 5 PSI OR LESS. FOR USE ONLY AT TERMINATION TO FIXED OUTLETS OR EQUIPMENT, MAXIMUM LENGTH: 48". PROVIDE MALLEABLE IRON, FLANGE MOUNTED, STRAIGHT OR 90 FITTING AT WALL TERMINATION WITH MAXIMUM 12" LENGTH OF TUBING ON INLET OF FLANGE.
6. ACCEPTABLE MANUFACTURERS: TRACPIPE, GASTITE, PARKER (PARFLEX), PROFLEX (1 YELLOW CSST).

PIPING - 2-1/2" AND OVER:
1. PIPE: STANDARD WEIGHT STEEL, BEVELED ENDS, ASTM A53.
2. JOINTS: BUTT WELDED AND FLANGED.
3. FITTINGS: STANDARD WEIGHT SEAMLESS STEEL, BUTT WELD TYPE, ASTM A234, GRADE I, ANSI B16.9.
4. FLANGES: 150# FORGED STEEL, WELD NECK OR SLIP -ON, ASTM A181, GRADE I, ANSI B16.5. FLANGE FACE SEAL WELD (BACKWELD) IS REQUIRED FOR SLIP-ON FLANGES.

SHUTOFF VALVES/THROTTLING VALVES:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, SHUTOFF VALVES WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

BA-13: 2" AND UNDER, THREADED 600 PSI CWP; UL LISTED FOR 250# LP, FLAMMABLE LIQUID, HEATING OIL, NATURAL AND MANUFACTURED GASES, 150 PSI STEAM, BRONZE BODY AND CHROME PLATED BRASS BALL, TEFLON SEATS AND PACKING. APOLLO #80-100, NIBCO #T580-70-UL OR #T585-70-UL, WATTS #B-6000.

PL-1: 2" AND UNDER, 125# STEAM @ 450ºF, 175# CWP @ 180ºF, CAST IRON BODY, SCREWED, FULL PORT. WALWORTH #1700, DEZURIK #425, S-RS49.

CHECK VALVES:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, CHECK VALVES WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

CK-1: 2" AND UNDER, 125# STEAM @ 406ºF, 200# CWP @ 150ºF, SCREWED, BRONZE, HORIZONTAL SWING. CRANE #37, HAMMOND #IB904, STOCKHAM #B319-Y, WALWORTH #3406, MILWAUKEE #509, WATTS #B-5000, NIBCO Y-413B.

CK-13: 2-1/2" THRU 12", 200# CWP, DOUBLE DISC WAFER TYPE, IRON BODY, BRONZE OR ALUMINUM-BRONZE DISCS, 316SS SHAFT AND SPRING, VITON, EPDM OR BUNA-N, CV'KY OF AT LEAST 700603 IN 6"1 SIZE. MUELLER STEAM SPECIALTY CO. #71-AHB-6-H, STOCKHAM #WG-961 EPDM OR #WG970 BUNA, NIBCO W-920-W, CRANE.

STRAINERS:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, STRAINERS WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

ST-2: CAST IRON BODY, 125 LB.CLASS 125 FLANGED ENDS, BOLTED COVER, 125 PSI S @ 350°F, 175 PSI CWP @ 150°F. ARMSTRONG #A1FL, METRAFLEX #TF, MUELLER STEAM SPECIALTY CO.#751, SARCO #CI-125, WATTS #77F-D.

ST-4: CAST IRON BODY, SCREWED ENDS, SCREWED COVER, 250# STEAM @ 406°F, 300 # CWP @ 150°F. ARMSTRONG #A1SC, METRAFLEX #SM, MUELLER STEAM SPECIALTY CO. #11, SARCO #IT.

PREPARATION
REAM PIPE AND TUBE ENDS, REMOVE BURRS, BEVEL PLAIN END FERROUS PIPE.

REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE BEFORE ASSEMBLY.

REMOVE ALL SCALE, RUST, DIRT, OILS, STICKERS AND THOROUGHLY CLEAN EXTERIOR OF ALL BARE METAL EXPOSED PIPING, HANGERS, AND ACCESSORIES IN PREPARATION TO BE PAINTED.

CONNECT TO ALL EQUIPMENT WITH FLANGES OR UNIONS.

AFTER COMPLETION, FILL, CLEAN, AND TREAT SYSTEMS. REFER TO SECTION 23 25 00 FOR TREATMENT.

TESTING PIPING
LOW PRESSURE - UP TO 1 PSI: TEST PIPING WITH 20 PSI AIR PRESSURE. SYSTEM MUST HOLD THIS PRESSURE WITHOUT ADDING AIR FOR TWO HOURS.

HIGH PRESSURE - ABOVE 1 PSI: TEST PIPING WITH COMPRESSED AIR AT TWICE THE OPERATING GAS PRESSURE, BUT AT LEAST 20 PSI. SYSTEM MUST HOLD THIS PRESSURE WITHOUT ADDING AIR FOR TWO HOURS.

A NON-COMBUSTIBLE ODORANT, SUCH AS OIL OF WINTERGREEN, MAY BE ADDED TO HELP LOCATE LEAKS.

CLEANING PIPING & ASSEMBLY
PRIOR TO ASSEMBLY OF PIPE AND PIPING COMPONENTS, REMOVE ALL LOOSE DIRT, SCALE, OIL AND OTHER FOREIGN MATTER ON INTERNAL OR EXTERNAL SURFACES BY MEANS CONSISTENT WITH GOOD PIPING PRACTICE SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER. BLOW CHIPS AND BURRS OUT OF PIPE BEFORE ASSEMBLY. WIPE CUTTING OIL FROM INTERNAL AND EXTERNAL SURFACES.

DURING FABRICATION AND ASSEMBLY, REMOVE SLAG AND WELD SPATTER FROM BOTH INTERNAL AND EXTERNAL JOINTS BY PEENING, CHIPPING AND WIRE BRUSHING TO THE DEGREE CONSISTENT WITH GOOD PIPING PRACTICES.

NOTIFY THE ARCHITECT/ENGINEER PRIOR TO STARTING ANY POST ERECTION CLEANING OPERATION IN TIME TO ALLOW WITNESSING THE OPERATION. PROPERLY DISPOSE OF CLEANING AND FLUSHING FLUIDS.

SECTION 23 10 23 NATURAL GAS AND PROPANE PIPING (CONT.)

PRIOR TO BLOWING OR FLUSHING ERECTED PIPING SYSTEMS, DISCONNECT ALL INSTRUMENTATION AND EQUIPMENT, OPEN WIDE ALL VALVES, CONTROL VALVES, AND BALANCE VALVES, AND VERIFY ALL STRAINER SCREENS ARE IN PLACE.

INSTALLATION
ROUTE PIPING IN ORDERLY MANNER, STRAIGHT, PLUMB, WITH CONSISTENT PITCH, PARALLEL TO BUILDING STRUCTURE, WITH MINIMUM USE OF OFFSETS AND COUPLINGS. PROVIDE ONLY OFFSETS REQUIRED FOR NEEDED HEADROOM OR CLEARANCE AND NEEDED FLEXIBILITY IN PIPE SYSTEM.

INSTALL PIPING TO CONSERVE BUILDING SPACE, AND NOT INTERFERE WITH OTHER WORK.

DO NOT INSTALL PIPING OR OTHER EQUIPMENT ABOVE ELECTRICAL SWITCHBOARDS OR PANELBOARDS. THIS INCLUDES A DEDICATED SPACE EXTENDING 25 FEET FROM THE FLOOR TO THE STRUCTURAL CEILING WITH WIDTH AND DEPTH EQUAL TO THE EQUIPMENT.

GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.

INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.

PROVIDE CHAIN OPERATORS FOR ALL VALVES OVER 2" SIZE THAT ARE OVER 10'-0" ABOVE FINISHED FLOOR. EXTEND TO 7'-0" ABOVE FINISHED FLOOR.

PROVIDE VALVE POSITION INDICATOR ON ALL VALVES 10'-0" OR GREATER ABOVE FINISH FLOOR AND NOT LOCATED ABOVE CEILING.

PROVIDE CLEARANCE FOR ACCESS TO VALVES AND FITTINGS.

PROVIDE ACCESS DOORS WHERE VALVES ARE NOT EXPOSED.

PREPARE PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING.

INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

PROVIDE SHUTOFF VALVES AND FLANGES OR UNIONS AT ALL CONNECTIONS TO EQUIPMENT, TRAPS, AND ITEMS THAT REQUIRE SERVICING.

PROVIDE SHUTOFF VALVES TO ISOLATE PART OF SYSTEMS AND VERTICAL RISERS.

ARRANGE PIPING AND PIPING CONNECTIONS SO EQUIPMENT MAY BE SERVICED OR TOTALLY REMOVED WITHOUT DISTURBING PIPING BEYOND FINAL CONNECTIONS AND ASSOCIATED SHUTOFF VALVES.

REDUCERS ARE GENERALLY NOT SHOWN. WHERE PIPE SIZES ARE NOT SHOWN, THE LARGER SIZE IN EITHER DIRECTION SHALL CONTINUE THROUGH THE FITTING NEAREST TO THE INDICATION OF A SMALLER PIPE SIZE.

BONDING AND GROUNDING
EACH ABOVE GROUND PORTION OF A CORRUGATED STAINLESS STEEL TUBING GAS PIPING SYSTEMS SHALL BE BONDED TO THE ELECTRICAL SERVICE GROUNDING ELECTRODE SYSTEM. THE BONDING JUMPER SHALL CONNECT TO A METALLIC PIPE OR FITTING BETWEEN THE POINT OF DELIVERY AND THE FIRST DOWNSTREAM CORRUGATED STAINLESS STEEL TUBE FITTING. THE BONDING JUMPER SHALL NOT BE SMALLER THAN 6 AWG COPPER WIRE OR EQUIVALENT. GAS PIPING SYSTEMS THAT CONTAIN ONE OR MORE SEGMENTS OF CORRUGATED STAINLESS STEEL TUBING SHALL BE BONDED IN ACCORDANCE WITH THIS SECTION.

EACH ABOVE GROUND PORTION OF A GAS PIPING SYSTEM, OTHER THAN CORRUGATED STAINLESS STEEL TUBING SYSTEMS, THAT IS LIKELY TO BECOME ENERGIZED SHALL BE ELECTRICALLY CONTINUOUS AND BONDED TO AN EFFECTIVE GROUND-FAULT CURRENT PATH. GAS PIPING, OTHER THAN CORRUGATED STAINLESS STEEL TUBING, SHALL BE CONSIDERED TO BE BONDED WHEN IT IS CONNECTED TO APPLIANCES THAT ARE CONNECTED TO THE APPLIANCE GROUNDING CONDUCTOR OF THE CIRCUIT SUPPLYING THAT APPLIANCE.

GAS PIPING SHALL NOT BE USED AS A GROUNDING CONDUCTOR OR ELECTRODE.

WHERE A LIGHTNING PROTECTION SYSTEM IS INSTALLED, THE BONDING OF THE GAS PIPING SHALL BE IN ACCORDANCE WITH NFPA 780, STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS.

PIPE ERECTION AND LAYING
CAREFULLY INSPECT ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES PRIOR TO INSTALLATION. IMMEDIATELY REJECT AND REMOVE FROM THE JOB ANY ITEMS WHICH ARE UNSUITABLE, CRACKED OR OTHERWISE DEFECTIVE.

ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES SHALL HAVE FACTORY-APPLIED MARKINGS, STAMPINGS, OR NAMEPLATES SUFFICIENT TO DETERMINE THEIR CONFORMANCE WITH SPECIFIED REQUIREMENTS.

EXERCISE CARE AT EVERY STAGE OF STORAGE, HANDLING, LAYING AND ERECTING TO PREVENT ENTRY OF FOREIGN MATTER INTO PIPING, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES. DO NOT ERECT OR INSTALL ANY UNCLEAN ITEM.

DURING CONSTRUCTION, UNTIL SYSTEM IS FULLY OPERATIONAL, KEEP ALL OPENINGS IN PIPING AND EQUIPMENT CLOSED AT ALL TIMES EXCEPT WHEN ACTUAL WORK IS BEING PERFORMED ON THAT ITEM. CLOSURES SHALL BE PLUGS, CAPS, BLIND FLANGES OR OTHER ITEMS DESIGNED FOR THIS PURPOSE.

CHANGE DIRECTION OF PIPES ONLY WITH FITTINGS OR PIPE BENDS. CHANGE SIZE ONLY WITH FITTINGS. DO NOT USE MITER FITTINGS, FACE OR FLUSH BUSHINGS, OR STREET ELBOWS. ALL FITTINGS SHALL BE LONG RADIUS TYPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED. CONSTRUCT WELDED ELBOWS OF ANGLES NOT AVAILABLE AS STANDARD FITTINGS BY CUTTING AND WELDING STANDARD ELBOWS TO FORM SMOOTH, LONG RADIUS FITTINGS.

USE FULL AND DOUBLE LENGTHS OF PIPE WHEREVER POSSIBLE.

CUT ALL PIPE TO EXACT MEASUREMENT AND INSTALL WITHOUT SPRINGING OR FORCING.

DO NOT CREATE, EVEN TEMPORARILY, UNDUE LOADS, FORCES OR STRAINS ON VALVES, EQUIPMENT OR BUILDING ELEMENTS.

DRAINING AND VENTING
UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL HORIZONTAL PIPES, INCLUDING BRANCHES, SHALL PITCH 1" IN 40 FEET12 TO LOW POINTS FOR COMPLETE DRAINAGE.

USE ECCENTRIC REDUCING FITTINGS ON HORIZONTAL RUNS WHEN CHANGING SIZE FOR PROPER DRAINAGE AND VENTING. INSTALL GAS PIPES WITH BOTTOM OF PIPE AND ECCENTRIC REDUCERS IN A CONTINUOUS LINE.

PROVIDE DRIP LEGS AT LOW POINTS AND AT THE BASE OF ALL RISERS IN GAS PIPES. DRIP LEGS SHALL BE FULL LINE SIZE ON PIPES THROUGH 4" AND AT LEAST 4", BUT NOT LESS THAN HALF LINE SIZE OVER 4". DRIP LEGS SHALL BE 12" MINIMUM LENGTH, CAPPED WITH A REDUCER TO A DRAIN VALVE.

BRANCH CONNECTIONS
MAKE BRANCH CONNECTIONS WITH STANDARD TEE OR CROSS FITTINGS OF THE TYPE REQUIRED FOR THE SERVICE UNLESS OTHERWISE SPECIFIED HEREIN OR DETAILED ON THE DRAWINGS.

AT THE OPTION OF THE CONTRACTOR, BRANCH CONNECTIONS FROM HEADERS AND MAINS MAY BE CUT INTO BLACK STEEL PIPE USING FORGED WELD -ON FITTINGS.

USE OF FORGED WELD-ON FITTIN

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SECTION INCLUDES
PIPING INSULATION
INSULATION JACKETS

QUALITY ASSURANCE
MATERIALS: FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 IN ACCORDANCE WITH ASTM E84, NFPA 255, OR UL 723 (WHERE REQUIRED).

INSULATION MATERIALS
TYPE A: GLASS FIBER; ANSI/ASTM C547; 0.24 MAXIMUM 'K' VALUE AT 75F; NON-COMBUSTIBLE. ALL PURPOSE, WHITE KRAFT JACKET BONDED TO ALUMINUM FOIL AND REINFORCED WITH FIBERGLASS YARN; 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723).

TYPE B: ELASTOMERIC CELLULAR FOAM; ANSI/ASTM C534; FLEXIBLE PLASTIC; 0.27 MAXIMUM 'K' VALUE AT 75F, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723). MAXIMUM 1" THICK PER LAYER WHERE MULTIPLE LAYERS ARE SPECIFIED.

VAPOR BARRIER JACKETS
KRAFT REINFORCED FOIL VAPOR BARRIER WITH SELF-SEALING ADHESIVE JOINTS. BEACH PUNCTURE RESISTANCE RATIO OF AT LEAST 50 UNITS. TENSILE STRENGTH: 35 PSI MINIMUM. SINGLE, SELF-SEAL ACRYLIC ADHESIVE ON LONGITUDINAL JACKET LAPS AND BUTT STRIPS.

REFRIGERANT PIPE COUPLING
INSULATION COUPLING: MOLDED THERMOPLASTIC ASTM D1525, -65F TO 275F, SIZES UP TO 4-1/8" O.D., AND RECEIVE INSULATION THICKNESS UP TO 1". SUITABLE FOR USE INDOORS OR OUTDOORS WITH UV STABILIZERS.

ACCEPTABLE MANUFACTURERS: KLO-SHURE OR EQUAL.

PREPARATION
INSTALL INSULATION AFTER PIPING HAS BEEN TESTED. PIPE SHALL BE CLEAN, DRY AND FREE OF RUST BEFORE APPLYING INSULATION.

GENERAL INSTALLATION REQUIREMENTS
INSTALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS, BUILDING CODES AND INDUSTRY STANDARDS.

CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PENETRATIONS. THIS APPLIES TO ALL INSULATED PIPING. MAINTAIN FIRE RATING OF ALL PENETRATIONS.

NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.

ON ALL INSULATED PIPING, PROVIDE AT EACH SUPPORT AN INSERT OF SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION, BETWEEN THE PIPE AND INSULATION JACKET. TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE INSERT SHALL BE SUITABLE FOR PLANNED TEMPERATURES, BE SUITABLE FOR USE WITH SPECIFIC PIPE MATERIAL, AND SHALL BE A 180 CYLINDRICAL SEGMENT THE SAME LENGTH AS METAL SHIELDS. INSERTS SHALL BE A CELLULAR GLASS (FOR ALL TEMPERATURE RANGES) OR MOLDED HYDROUS CALCIUM SILICATE (FOR PIPE WITH OPERATING TEMPERATURES ABOVE 70F, WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 PSI. POLYISOCYANURATE INSULATION WITH A MINIMUM COMPRESSIVE STRENGTH OF 24 PSI IS ACCEPTABLE FOR PIPE SIZES 3" AND BELOW, MINIMUM 60 PSI FOR PIPE SIZES 4", AND OPERATE BELOW 300F. FACTORY FABRICATED INSERTS MAY BE USED. RECTANGULAR BLOCKS, PLUGS, OR WOOD MATERIAL ARE NOT ACCEPTABLE. TEMPORARY WOOD BLOCKING MAY BE USED BY THE PIPING CONTRACTOR FOR PROPER HEIGHT; HOWEVER, THESE MUST BE REMOVED AND REPLACED WITH PROPER INSERTS BY THE INSULATION CONTRACTOR.

INSTALL METAL SHIELDS BETWEEN ALL HANGERS OR SUPPORTS AND THE PIPE INSULATION. SHIELDS SHALL BE GALVANIZED SHEET METAL, HALF_ROUND WITH FLARED EDGES. ADHERE SHIELDS TO INSULATION. ON COLD PIPING, SEAL THE SHIELDS VAPOR-TIGHT TO THE INSULATION AS REQUIRED TO MAINTAIN THE VAPOR BARRIER, OR ADD SEPARATE VAPOR BARRIER JACKET.

SHIELDS SHALL BE AT LEAST THE FOLLOWING LENGTHS AND GAUGES:
PIPE SIZE; SHIELD SIZE:
1/2" TO 3" PIPE 12" LONG X 18 GAUGE
4" PIPE 12" LONG X 16 GAUGE
5" TO 6" PIPES 8" LONG X 16 GAUGE
8" TO 14" PIPES24" LONG X 14 GAUGE
16" TO 24" PIPES 24" LONG X 12 GAUGE

ALL PIPING AND INSULATION THAT DOES NOT MEET 25/50 THAT IS LOCATED IN AN AIR PLENUM SHALL HAVE WRITTEN APPROVAL FROM THE AUTHORITY HAVING JURISDICTION AND THE LOCAL FIRE DEPARTMENT FOR AUTHORIZATION AND MATERIALS APPROVAL. IF APPROVAL HAS BEEN ALLOWED, THE NON-RATED MATERIAL SHALL BE WRAPPED WITH A PRODUCT THAT HAS PASSED ASTM E84 AND/OR NFPA 255 TESTING WITH A RATING OF 25/50 OR BELOW.

INSULATED PIPING OPERATING BELOW 60F
INSULATE FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, FLEXIBLE HOSES, AND EXPANSION JOINTS. SEAL ALL PENETRATIONS OF VAPOR BARRIER.

ON PIPING OPERATING BELOW 60F IN LOCATIONS THAT ARE NOT MECHANICALLY COOLED (E.G., PENTHOUSES, MECHANICAL ROOMS, TUNNELS, CHASES AT EXTERIOR WALLS, ETC.), TYPE B INSULATION SHALL BE USED.

ALL BALANCE VALVES WITH FLUID OPERATING BELOW 60F SHALL BE INSULATED WITH A REMOVABLE PLUG WRAPPED WITH VAPOR BARRIER TAPE TO ALLOW READING AND ADJUSTING OF THE VALVE.

INSULATED PIPING OPERATING BETWEEN 60F AND 140F
DO NOT INSULATE FLANGES AND UNIONS, BUT BEVEL AND SEAL ENDS OF INSULATION AT SUCH LOCATIONS. INSULATE ALL FITTINGS, VALVES AND STRAINERS.

INSULATED PIPING OPERATING ABOVE 140F
INSULATE FITTINGS, VALVES, FLANGES, AND STRAINERS.

ALL BALANCE VALVES WITH FLUID OPERATING ABOVE 140F SHALL BE INSULATED AND AN OPENING SHALL BE LEFT IN THE INSULATION TO ALLOW FOR READING AND ADJUSTING THE VALVE.

REFRIGERANT PIPING
ON REFRIGERANT PIPING (25F AND ABOVE) AND NOT REQUIRED TO MEET THE 25/50 FLAME/SMOKE, PROVIDE AT EACH STRUT OR CLEVIS SUPPORT AN INSULATION COUPLING TO SUPPORT PIPE AND TO ACCEPT INSULATION THICKNESS OF ADJOINING INSULATION, TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE COUPLING SHALL BE SUITABLE FOR PLANNED TEMPERATURES, USE WITH SPECIFIED PIPE MATERIAL, AND SHALL BE A 360, ONE-PIECE CYLINDRICAL SEGMENT. USE MECHANICAL FASTENERS WHERE COUPLING CANNOT BE INSTALLED ON PIPE DURING INSTALLATION. CONTRACTOR SHALL APPLY ADHESIVE TO ENDS OF INSULATION ENTERING INSULATION COUPLING TO MAINTAIN VAPOR BARRIER.

EXPOSED PIPING
LOCATE AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.

WHERE EXPOSED INSULATED PIPING EXTENDS ABOVE THE FLOOR, PROVIDE A SHEET METAL GUARD AROUND THE INSULATION EXTENDING 12" ABOVE THE FLOOR. GUARD SHALL BE 0.016" CYLINDRICAL SMOOTH OR STUCCO ALUMINUM AND SHALL FIT TIGHTLY TO THE INSULATION.

INSULATION INSTALLATION
TYPE A INSULATION;
1. ALL SERVICE JACKETS: SEAL ALL LONGITUDINAL JOINTS WITH SELF_SEAL LAPS USING A SINGLE PRESSURE SENSITIVE ADHESIVE SYSTEM. DO NOT STAPLE.
2. INSULATION WITHOUT SELF-SEAL LAP MAY BE USED IF INSTALLED WITH BENJAMIN FOSTER 85_20 OR EQUIVALENT CHICAGO MASTIC, 3M OR CHILDERS LAP ADHESIVE.
3. APPLY INSULATION WITH LAPS ON TOP OF PIPE.
4. FITTINGS, VALVE BODIES AND FLANGES: FOR 4" AND SMALLER PIPES, INSULATE WITH 1 LB DENSITY INSULATION WRAPPED UNDER COMPRESSION TO A THICKNESS EQUAL TO THE ADJACENT PIPE INSULATION. FOR PIPES OVER 4", USE MITERED SEGMENTS OF PIPE INSULATION. FINISH WITH PREFORMED PLASTIC FITTING COVERS. SECURE FITTING COVERS WITH PRESSURE SENSITIVE TAPE AT EACH END. OVERLAP TAPE AT LEAST 2" ON ITSELF. FOR PIPES OPERATING BELOW 60F, SEAL FITTING COVERS WITH VAPOR RETARDER MASTIC IN ADDITION TO TAPE.

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TYPE B INSULATION;
1. ELASTOMERIC CELLULAR FOAM: WHERE POSSIBLE, SLIP INSULATION OVER THE OPEN END OF PIPE WITHOUT SLITTING. SEAL ALL BUTT ENDS, LONGITUDINAL SEAMS, AND FITTINGS WITH ADHESIVE. AT ELBOWS AND TEES, USE MITERED CONNECTIONS. DO NOT COMPRESS OR CRUSH INSULATION AT CEMENTED JOINTS. JOINTS SHALL BE SEALED COMPLETELY AND NOT PUCKER OR WRINKLE. PAINT THE OUTSIDE OF OUTDOOR INSULATION WITH TWO COATS OF LATEX ENAMEL PAINT RECOMMENDED BY THE MANUFACTURER.
2. SELF-SEAL INSULATION MAY BE USED ON PIPES OPERATING BELOW 170F.

PLASTIC COVERING;
1. PROVIDE VAPOR BARRIER AS SPECIFIED FOR INSULATION TYPE. COVER WITH PLASTIC JACKET COVERING. POSITION SEAMS TO SHED WATER.
2. SOLVENT WELD ALL JOINTS WITH MANUFACTURER RECOMMENDED CEMENT.
3. OVERLAP ALL LAPS AND BUTT JOINTS 1-1/2" MINIMUM. REPAIR ANY LOOSE ENDS THAT DO NOT SEAL SECURELY. SOLVENT WELD ALL FITTING COVERS IN THE SAME MANNER. FINAL INSTALLATION SHALL BE WATERTIGHT.
4. ALL JOINTS IN AREAS NOTED SHALL MEET USDA STANDARDS FOR TOTALLY SEALED SYSTEMS, INCLUDING OVERLAPS OF 1" ON CIRCUMFERENTIAL AND 1.5" TO 2" ON LONGITUDINAL SEAMS.
5. USE PLASTIC INSULATION COVERING ON ALL EXPOSED PIPES INCLUDING, BUT NOT LIMITED TO:
A. ALL PIPING IN MECHANICAL ROOMS AND/OR TUNNELS THAT IS SUBJECT TO DAMAGE FROM NORMAL OPERATIONS. (EXAMPLE: PIPING THAT MUST BE STEPPED OVER ROUTINELY.)
6. ELASTOMERIC PIPING INSULATION MAY HAVE TWO COATS OF LATEX PAINT INSTEAD OF PLASTIC JACKET.
7. USE COLORED PLASTIC COVERING ON THE FOLLOWING PIPES:
a. ALL EXTERIOR PIPING.

END OF SECTION

SECTION 23 81 26 - SPLIT SYSTEM AIR CONDITIONING UNITS

WARRANTY
PROVIDE FIVE (5) YEAR MANUFACTURER'S WARRANTY ON ALL COMPRESSORS.

SPLIT SYSTEM WALL AND CEILING-MOUNTED UNITS
ACCEPTABLE MANUFACTURERS: CARRIER/TOSHIBA; PANASONIC; LG; SANYO; SAMSUNG; DAIKIN APPLIED; MITSUBISHI

MANUFACTURED UNITS: PROVIDE PACKAGED, AIR-COOLED, FACTORY ASSEMBLED, PRE-WIRED, AND PRE -PIPED UNIT CONSISTING OF CABINET, FANS, FILTERS, REMOTE CONDENSING UNIT, AND CONTROLS. WALL -MOUNTED UNITS SHALL BE FURNISHED WITH INTEGRAL WALL MOUNTING BRACKET AND MOUNTING HARDWARE. ASSEMBLE UNIT FOR WALL-MOUNTED OR CEILING INSTALLATION WITH SERVICE ACCESS REQUIRED.

PERFORMANCE SHALL BE AS SCHEDULED ON THE DRAWINGS. UNIT SHALL BE RATED PER AHRI STANDARDS 210/240 AND LISTED IN THE AHRI DIRECTORY AS A MATCHED SYSTEM. PROVIDE UNIT WITH FACTORY-SUPPLIED CLEANABLE AIR FILTERS. THE UNITS SHALL BE LISTED BY ELECTRICAL LABORATORIES (ETL) IN ACCORDANCE WITH UL-1995 CERTIFICATION AND BEAR THE ETL LABEL. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC).

OUTDOOR UNIT
GENERAL: THE OUTDOOR UNIT SHALL BE SPECIFICALLY MATCHED TO THE CORRESPONDING INDOOR UNIT SIZE. THE OUTDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND PRE-WIRED WITH ALL NECESSARY ELECTRONIC AND REFRIGERANT CONTROLS.

CABINET: THE OUTDOOR UNIT SHALL BE FABRICATED OF GALVANIZED STEEL, BONDERIZED, AND COATED WITH A BAKED ENAMEL FINISH FOR CORROSION PROTECTION.

FAN: THE FAN SHALL BE DIRECT DRIVE, PROPELLER TYPE FAN WITH FAN GUARD. FAN BLADES SHALL BE STATICALLY AND DYNAMICALLY BALANCED. THE FAN SHALL HAVE PERMANENTLY LUBRICATED TYPE BEARINGS.

MOTOR SHALL BE PROTECTED BY INTERNAL THERMAL OVERLOAD PROTECTION. AIRFLOW SHALL BE HORIZONTAL DISCHARGE.

COIL: THE OUTDOOR COIL SHALL BE NONFERROUS CONSTRUCTION WITH CORRUGATED FIN TUBE. THE COIL SHALL BE PROTECTED WITH AN INTERNAL GUARD. REFRIGERANT FLOW FROM THE CONDENSER SHALL BE CONTROLLED VIA A METERING DEVICE.

COMPRESSOR: HERMETIC OR SCROLL REFRIGERANT COMPRESSORS WITH RESILIENT SUSPENSION SYSTEM, INVERTER DRIVEN, OIL STRAINER, SIGHT GLASS/MOISTURE INDICATOR, INTERNAL MOTOR PROTECTION, HIGH PRESSURE SWITCH, AND CRANKCASE HEATER. THE OUTDOOR UNIT SHALL HAVE AN ACCUMULATOR AND FOUR-WAY REVERSING VALVE.

REFRIGERANT: UNIT SHALL USE R-410A.THE USE OF CHLOROFLUOROCARBON (CFC)-BASED REFRIGERANTS IS PROHIBITED.

INTEGRAL CONDENSATE PUMP: PACKAGED UNIT MATCHED TO EVAPORATOR UNIT INCLUDING FLOAT SWITCH, PUMP, MOTOR ASSEMBLY, CHECK VALVE, AND RESERVOIR. PROVIDE ALARM TO INDICATE HIGH LEVEL RESERVOIR. UNIT SHALL BE POWERED FROM EVAPORATOR UNIT WITH APPROPRIATE FIELD CONNECTIONS AVAILABLE.

REFRIGERANT PIPING: DESIGN PRESSURE: 450 PSIG. MAXIMUM DESIGN TEMPERATURE: 250 F. PIPING - 4" AND UNDER. TUBING: TYPE ACR SEAMLESS COPPER TUBE LINESETS, ASTM B1003. SIZES INDICATED ARE NOMINAL DESIGNATION. JOINTS: BRAZED WITH SILVER SOLDER. FITTINGS: WROUGHT COPPER SOLDER JOINT, ANSI B16.22. SPECIAL REQUIREMENTS: ALL TUBING SHALL BE CLEANED, DEHYDRATED, PRESSURIZED WITH DRY NITROGEN, PLUGGED, AND TAGGED BY MANUFACTURER "FOR REFRIGERATION SERVICE". DURING BRAZING OPERATIONS, CONTINUOUSLY PURGE THE INTERIOR OF THE PIPE WITH NITROGEN TO PREVENT OXIDE FORMATION. REFRIGERANT LINESETS ARE PERMITTED. PROVIDE REFRIGERANT LINESETS AND ACCESSORIES OF SIZES NEEDED FOR INSTALLATION. VERIFY LENGTHS OF PIPING REQUIRED FOR INSTALLATION.

INSULATION: EPDM (NBR/PVC BLEND IS NOT PERMITTED) ELASTOMERIC CELLULAR FOAM; ANSI/ASTM C534; FLEXIBLE PLASTIC; 0.25 MAXIMUM 'K' VALUE AT 75ºF, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723). MINIMUM 1/2" THICK FOR PIPE SIZES < 1-1/4" AND 3/4" THICK FOR PIPE SIZES 1-1/4" AND ABOVE.

INSTALLATION
GENERAL INSTALLATION REQUIREMENTS: VERIFY THAT PROPER POWER SUPPLY IS AVAILABLE. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL ALL UNITS LEVEL AND PLUMB. INDOOR UNITS SHALL BE INSTALLED USING MANUFACTURER'S STANDARD MOUNTING HARDWARE SECURELY FASTENED TO BUILDING STRUCTURE.

COORDINATE THE EXACT MOUNTING LOCATION OF ALL INDOOR AND OUTDOOR UNITS WITH ARCHITECTURAL AND ELECTRICAL WORK. COORDINATE INSTALLATION OF CEILING-MOUNTED UNITS WITH CEILING GRID LAYOUT. PROVIDE ADDITIONAL CEILING GRID REINFORCEMENT OR MODIFICATION AS REQUIRED AND COORDINATE THE WORK WITH THE GC. LOCATE THE INDOOR UNIT WHERE IT IS READILY ACCESSIBLE FOR MAINTENANCE AND FILTER CHANGES. WHERE OUTDOOR UNITS ARE LOCATED ON THE ROOF, LOCATE AT LEAST 10' FROM THE ROOF EDGE.

VERIFY LOCATIONS OF WALL-MOUNTED REMOTE CONTROLLERS WITH DRAWINGS AND ROOM DETAILS BEFORE INSTALLATION. COORDINATE MOUNTING HEIGHTS TO BE CONSISTENT WITH OTHER WALL-MOUNTED DEVICES. HEIGHT ABOVE FINISHED FLOOR SHALL NOT EXCEED 48".

REFRIGERANT PIPING: INSTALL REFRIGERANT PIPING FROM THE INDOOR UNIT(S) TO THE CONDENSING UNIT. REFRIGERANT PIPE SIZES, LENGTHS, SPECIALTIES AND CONFIGURATIONS SHALL BE AS RECOMMENDED BY THE MANUFACTURER. EVACUATE REFRIGERANT PIPING AND FULLY CHARGE SYSTEM WITH REFRIGERANT PER MANUFACTURER'S REQUIREMENTS. PROVIDE WEATHERTIGHT INSULATED ROOF CURB TO ACCOMMODATE REFRIGERANT PIPING AND CONDUIT ROOF PENETRATIONS. INSULATE ALL REFRIGERANT PIPING. ALL REFRIGERANT PIPING INSTALLED UNDERGROUND SHALL BE PROPERLY SLEEVED AND INSULATED PER MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS. CONDUITS FOR PIPING SHALL BE SEALED WATERTIGHT AND SHALL NOT RETAIN WATER.

INSULATION: INSULATE ALL REFRIGERANT PIPES BETWEEN THE HEAT PUMP AND INDOOR UNITS. THIS INCLUDES THE LIQUID PIPE, THE SUCTION PIPE, THE HOT GAS PIPE, AND THE HIGH/LOW PRESSURE GAS PIPE. ALL FITTINGS, VALVES, AND SPECIALTY REFRIGERANT COMPONENTS IN THE PIPING BETWEEN THE INDOOR AND HEAT PUMP UNITS SHALL ALSO BE INSULATED. THE INSULATION SHALL HAVE A CONTINUOUS VAPOR BARRIER AND SHALL PASS THROUGH HANGERS AND SUPPORTS UNBROKEN. ALL EXTERIOR INSULATED PIPING SHALL BE PAINTED WITH MINIMUM OF ONE (1) COAT OF UV RESISTANT PAINT. OVERSIZE HANGERS AND SUPPORTS TO ALLOW THE INSULATION TO PASS THROUGH UNBROKEN. FOLLOWING ARE THE MINIMUM INSULATION THICKNESSES UNLESS NOTED OTHERWISE IN THE MANUFACTURER'S LITERATURE OR REQUIRED BY LOCAL AHJ:

ASHRAE MOST CURRENT VERSION
PIPE SYSTEM INSULATION THICKNESS
REFRIGERANT SUCTION (40ºF & BELOW) UP TO 1 " 1/2"
1" AND UP 1"
REFRIGERANT SUCTION (41ºF TO 60°F) UP TO 1-1/2" 1/2"
1-1/2" AND UP 1" 2-1/2"
REFRIGERANT LIQUID
UP TO 1-1/2" 1"
1-1/2" AND UP 1-1/2"

CONDENSATE REMOVAL: INSTALL CONDENSATE PIPING WITH TRAP AND ROUTE FROM DRAIN PAN TO NEAREST DRAIN. DISCHARGE TO NEAREST CODE-APPROVED RECEPTOR OR TO A PROPERLY VENTED INDIRECT WASTE FITTING. FLUSH ALL PIPING BEFORE MAKING FINAL CONNECTIONS TO UNITS.

COMB ALL COILS TO REPAIR BENT FINS. INSTALL NEW FILTERS IN THE UNIT AT SUBSTANTIAL COMPLETION. A FACTORY-AUTHORIZED SERVICE AGENT SHALL ASSIST IN COMMISSIONING THE UNIT AND INSPECTING THE INSTALLATION PRIOR TO STARTUP. SUBMIT STARTUP REPORT WITH O&M MANUALS.

23 54 00 - FORCED AIR FURNACES

SECTION INCLUDES:
FORCED AIR FURNACES.
REFRIGERANT COOLING COIL AND CONDENSING UNIT.
QUALITY ASSURANCE
CONFORM TO REQUIREMENTS OF UL AND APPLICABLE CODES.
COOLING SYSTEM TESTED AND RATED PER AHRI STANDARD 210.
CONFORM TO ASHRAE 90.1.

ACCEPTABLE MANUFACTURERS:
1. BRYANT
2. CARRIER
3. LENNOX
4. TRANE
5. DAIKIN
6. RHEEM

TYPE:
PROVIDE SELF-CONTAINED, PACKAGED, FACTORY ASSEMBLED, PRE-WIRED UNIT CONSISTING OF CABINET, SUPPLY FAN, HEAT EXCHANGER, BURNER OR HEATER, CONTROLS, AIR FILTER, REFRIGERANT COOLING COIL AND OUTDOOR PACKAGE CONTAINING COMPRESSOR, CONDENSER COIL AND CONDENSER FAN.

FABRICATION:
CABINET: GALVANIZED STEEL WITH BAKED ENAMEL FINISH, EASILY REMOVED AND SECURED ACCESS DOORS, GLASS FIBER INSULATION AND REFLECTIVE LINER.
COMBUSTION CHAMBER: PRE-CAST REFRACTORY.
SUPPLY FAN: CENTRIFUGAL TYPE, RUBBER MOUNTED WITH DIRECT DRIVE, RUBBER ISOLATED 1750 RPM, 4-SPEED MOTOR.
AIR FILTERS: 1" (25 MM) THICK GLASS FIBER, DISPOSABLE TYPE ARRANGED FOR EASY REPLACEMENT.

BURNER:
PERFORMANCE: MINIMUM 95% EFFICIENCY NATURAL GAS BURNER. REFER TO MECHANICAL SCHEDULES FOR CAPACITY AND TYPE.
GAS BURNER: CONDENSING SEALED COMBUSTION TYPE, COMBUSTION GAS VALVE AND PRESSURE REGULATOR INCORPORATING MANUAL SHUTOFF, STANDING PILOT, PILOT VALVE, AUTOMATIC 100% SHUTOFF, AND THERMOCOUPLE PILOT SAFETY DEVICE. 90% MINIMUM EFFICIENCY.

OPERATING CONTROLS:
PROVIDE LOW VOLTAGE, ADJUSTABLE ROOM THERMOSTATS TO CONTROL BURNER OPERATION.
PROVIDE HIGH LIMIT CONTROL, WITH FIXED STOP AT MAXIMUM PERMISSIBLE SETTING, TO DE-ENERGIZE BURNER ON EXCESSIVE BONNET TEMPERATURE AND ENERGIZE BURNER WHEN TEMPERATURE DROPS TO LOWER SAFE VALUE.
CONTROL SUPPLY FAN BASED ON BONNET TEMPERATURE INDEPENDENT OF BURNER CONTROLS. INCLUDE MANUAL SWITCH FOR CONTINUOUS FAN OPERATION.

INSTALLATION:
MOUNT COUNTERFLOW FURNACES ON COMBUSTIBLE FLOORS, ON ADDITIVE BASE. MOUNT AIR COOLED CONDENSER PACKAGE ON CONCRETE PAD.

END OF SECTION

23 05 05 MECHANICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.

WHERE WALLS, CEILINGS, ETC., ARE SHOWN AS BEING REMOVED ON GENERAL DRAWINGS, THE CONTRACTOR SHALL REMOVE ALL MECHANICAL EQUIPMENT, DEVICES, FIXTURES, PIPING, DUCTS, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, PARTITIONS, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL REMOVE, STORE, AND REPLACE EQUIPMENT, DEVICES, FIXTURES, PIPES, DUCTS, SYSTEMS, ETC.

VERIFY THAT ABANDONED UTILITIES SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND SERVICES TO FACILITIES OR EQUIPMENT THAT SHALL REMAIN IN OPERATION FOLLOWING DEMOLITION.

COORDINATE WORK WITH ALL OTHER CONTRACTORS AND THE LANDLORD/OWNER. SCHEDULE REMOVAL OF EQUIPMENT TO AVOID CONFLICTS.

THIS CONTRACTOR SHALL VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE EQUIPMENT IS SCHEDULED TO BE REPLACED OR MODIFIED, PRIOR TO ORDERING NEW EQUIPMENT.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION
DISCONNECT MECHANICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.

PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON OPERATING EQUIPMENT, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.

EXISTING HEATING SYSTEM: MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR SERVICE. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM THE OWNER AT LEAST 48 HOURS BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MINIMIZE OUTAGE DURATION.

DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK
DEMOLISH AND EXTEND EXISTING MECHANICAL WORK UNDER PROVISIONS OF DIVISION 2 AND THIS SECTION. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. REMOVE ABANDONED DUCTS AND PIPING TO SOURCE OF SUPPLY AND/OR MAIN LINES.

REMOVE EXPOSED ABANDONED PIPES AND DUCTS, INCLUDING ABANDONED PIPES AND DUCTS ABOVE ACCESSIBLE CEILINGS. CUT DUCTS FLUSH WITH WALLS AND FLOORS, CAP DUCT THAT REMAINS, AND PATCH SURFACES. CUT PIPES ABOVE CEILINGS, BELOW FLOORS AND BEHIND WALLS. CAP REMAINING LINES. REPAIR BUILDING CONSTRUCTION TO MATCH ORIGINAL. REMOVE ALL CLAMPS, HANGERS, SUPPORTS, ETC. ASSOCIATED WITH PIPE AND DUCT REMOVAL.

REMOVE UNUSED SECTIONS OF SUPPLY AND RETURN AIR DUCTWORK BACK TO MAINS. PATCH OPENING WITH SHEET METAL AND SEAL AIRTIGHT. PATCH EXISTING INSULATION TO MATCH EXISTING. WHERE EXISTING DUCTWORK IS TO BE CAPPED AND REUSED, LOCATE THE END CAP WITHIN 6" OF THE LAST BRANCH. END CAPS SHALL BE 3" PRESSURE CLASS AND SEAL CLASS "A".

DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS WHICH REMAIN. MODIFY INSTALLATION OR PROVIDE ACCESS PANELS AS APPROPRIATE.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.

EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING INSTALLATIONS, OR AS SPECIFIED.

PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN DEMOLISHED EQUIPMENT AND AS REQUIRED FOR EXTENSION OF EXISTING EQUIPMENT.

CUTTING AND PATCHING
THIS CONTRACTOR IS RESPONSIBLE FOR ALL PENETRATIONS OF EXISTING CONSTRUCTION REQUIRED TO COMPLETE THE WORK OF THIS PROJECT. PENETRATIONS IN EXISTING CONSTRUCTION SHOULD BE REVIEWED CAREFULLY PRIOR TO PROCEEDING WITH ANY WORK.

PENETRATIONS SHALL BE NEAT AND CLEAN WITH SMOOTH AND/OR FINISHED EDGES. CORE DRILL WHERE POSSIBLE FOR CLEAN OPENING.

REPAIR EXISTING CONSTRUCTION AS REQUIRED AFTER PENETRATION IS COMPLETE TO RESTORE TO ORIGINAL CONDITION. USE SIMILAR MATERIALS AND MATCH ADJACENT CONSTRUCTION UNLESS OTHERWISE NOTED OR AGREED TO BY THE ARCHITECT/ENGINEER PRIOR TO START OF WORK.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEANING AND REPAIR
CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED. CLEAN ALL SYSTEMS ADJACENT TO PROJECT WHICH ARE AFFECTED BY THE DUST AND DEBRIS CAUSED BY THIS CONSTRUCTION.

MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE LANDLORD/OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE LANDLORD/OWNER IN A LOCATION COORDINATED WITH THE LANDLORD/OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE LANDLORD/OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

SPECIAL REQUIREMENTS
REVIEW LOCATIONS OF ALL NEW PENETRATIONS IN EXISTING FLOOR SLABS OR WALLS. DETERMINE CONSTRUCTION TYPE AND REVIEW FOR POSSIBLE INTERFERENCES. BRING ALL CONCERNS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING.

END OF SECTION

IDAS/Ames/DOC CBC 2 AMPB
111 N SHERMAN AVE, AMES IA 50010

Horizon-Architecture

IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	Approver

SHEET TITLE
MECHANICAL SPECIFICATIONS

SCALE
Scale:

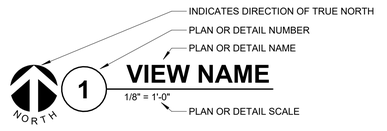
SHEET NUMBER
M501

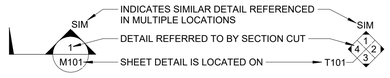
24003771.00 9/6/2024 12:07:28 PM IDAS/Ames/DOC CBC 2 AMPB

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
NEW
EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
EXISTING
EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2015 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	PARKER POLASCHEK
MECHANICAL	GRADY DEGENEFFE
ELECTRICAL	ZACH ROSS

PLUMBING SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
CW	COLD WATER - POTABLE
HW	HOT WATER - POTABLE
HWC	HOT WATER CIRCULATING - POTABLE
SAN	SANITARY DRAINAGE
V	VENT
G	NATURAL GAS
DPP	DRAIN
	PIPE CONTINUATION
	PIPE CAP
	PIPE DOWN
	PIPE UP OR UP/DOWN
FD	PIPE SERVING FIXTURE ON FLOOR ABOVE (EXAMPLE: FD = FLOOR DRAIN)
	DIRECTION OF FLOW IN PIPE
	ROUTE TO DRAIN
RD-1 6"(1000)	ROOF DRAIN PROPERTIES SYMBOL SIZE (ROOF SQ. FT.)
	SHUTOFF VALVE NORMALLY OPEN
GPM	BALANCING VALVE (NUMBER INDICATES GPM)
	CHECK VALVE
	SAFETY/RELIEF VALVE
	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB

PLUMBING ABBREVIATION KEY

ABBR:	DESCRIPTION:
BFP	BACKFLOW PREVENTER
CO	CLEANOUT
DN	DOWN
E	EXISTING
L or LAV	LAVATORY
MB	MOP BASIN
MV	MIXING VALVE
SCCR	SHORT CIRCUIT CURRENT RATING
SK	SINK
VTR	VENT THROUGH ROOF
WC	WATER CLOSET
WH	WATER HEATER
UON	UNLESS OTHERWISE NOTED

PLUMBING SHEET INDEX

PLUMBING SLOPE REQUIREMENTS:

BASED ON PLUMBING CODE: UPC-2018

INTERIOR:	
SANITARY WASTE:	1/4" PER FOOT
SANITARY:	NO SPECIFIC PITCH, PITCH TO FIXTURES
DOMESTIC WATER:	NO SPECIFIC PITCH, PITCH TO FIXTURES

PLUMBING ROUGH-IN SCHEDULE

NOTES: (APPLIES TO ALL PLUMBING FIXTURES LISTED BELOW)
1) SIZES SHOWN ARE MINIMUMS. LARGER SIZES SHOWN ON THE DRAWING SHALL DICTATE THE ROUGH-IN SIZE. 2) SANITARY RISERS UP IN WALL TO FIXTURES SHALL BE A MINUMUM OF 2". 3) DOMESTIC WATER BRANCH PIPING OUTSIDE OF THE WALL/CHASE SHALL BE A MINIMUM OF 3/4" UNLESS NOTED OTHERWISE. ONLY THE FINAL RISE-DROP SHALL BE SMALLER. 4) FINAL SANITARY SIZE SHALL MATCH P-TRAP SIZE (REFER TO MATERIAL LIST).

TAG NAME	DESCRIPTION	TRAP	COLD WATER	HOT WATER	SANITARY	VENT
EWC-E	ELECTRIC WATER COOLER		1/2"	-	1 1/2"	1 1/4"
FD-1	FLOOR DRAIN		-	-	2"	1 1/2"
L-1	LAVATORY (ACCESSIBLE)		1/2"	1/2"	1 1/2"	1 1/2"
MB-1	MOP BASIN		3/4"	3/4"	3"	1 1/2"
WC-1	WATER CLOSET (ACCESSIBLE)		1 1/2"	-	4"	2"
WMF-1	UTILITY BOX (WASHING MACHINE)		3/4"	3/4"	2"	1 1/4"

PLUMBING GENERAL NOTES:

1. THE SYMBOLS AND THE MATERIAL LIST ARE FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR SHALL VERIFY QUANTITIES AND FURNISH ALL MATERIALS REQUIRED FOR FULLY OPERATIONAL SYSTEMS, WHETHER SPECIFIED OR NOT.
2. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR A COMPLETE DESCRIPTION OF MATERIAL ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL TAKES PRECEDENCE OVER THE CATALOG NUMBER. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.
3. CONTRACTOR SHALL VERIFY THAT FIXTURES SUPPLIED ARE APPROVED PER ALL APPLICABLE STATE, LOCAL AND GOVERNING AUTHORITIES.
4. ALL FIXTURES SHALL CONFORM TO FEDERAL ACT S.3874
5. INVERT ELEVATIONS ARE FROM EXISTING DRAWINGS AND MAY NOT BE ACCURATE. VERIFY ALL ELEVATIONS BEFORE BEGINNING WORK.
6. REFER TO THE PLUMBING ROUGH-IN SCHEDULE FOR THE SIZES OF BRANCH PIPES TO PLUMBING FIXTURES.
7. EXISTING CONDITIONS ON DEMOLITION PLANS ARE PROVIDED TO INDICATE THE GENERAL SCOPE OF ITEMS TO BE REMOVED. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL DEMOLITION INFORMATION.
8. P.C. SHALL CUT AND PATCH EXISTING AS REQUIRED FOR NEW OR DEMOLITION WORK UNLESS NOTED OTHERWISE. REFER TO SPECIFICATION SECTION 22 05 05 FOR ADDITIONAL INFORMATION.

MECHANICAL GENERAL NOTES:

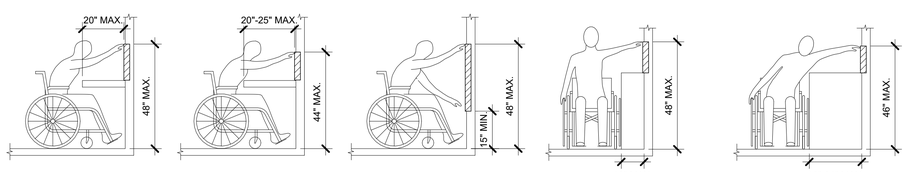
THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
3. DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
4. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
5. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
6. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
7. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
9. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3 '-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS .
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6 '-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR, PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.
12. PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN REMOVED EQUIPMENT/ REFRIGERANT PIPING. RECLAIMED REFRIGERANT SHALL HAVE DOCUMENTATION AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).



INSTALL ABOVE COUNTER DEVICE AT 44" ABOVE FINISHED FLOOR.

INSTALL ABOVE COUNTER DEVICE AT 40" ABOVE FINISHED FLOOR.

INSTALL DEVICE AT 18" ABOVE FINISHED FLOOR.

INSTALL DEVICE AT 44" ABOVE FINISHED FLOOR.

INSTALL DEVICE AT 42" ABOVE FINISHED FLOOR.

ADA GUIDELINES - FRONT ACCESS

ADA GUIDELINES - SIDE ACCESS

ADA STANDARDS FOR ACCESSIBLE DESIGN

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2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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KEY PLAN

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REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

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Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	Approver

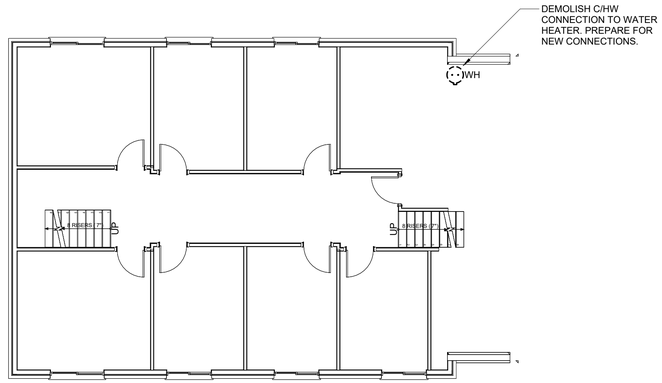
SHEET TITLE
PLUMBING COVERSHEET

SCALE
Scale: As indicated

SHEET NUMBER
P000

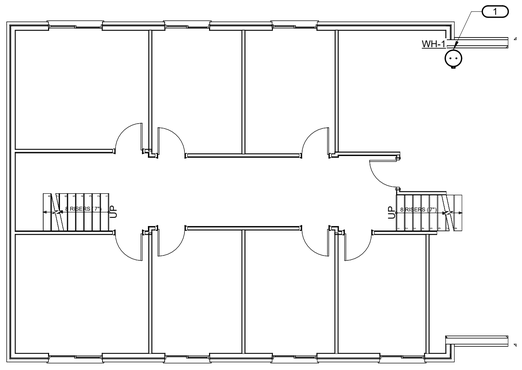
KEYNOTES:

1. TIE HOT AND COLD WATER INTO WATER HEATER. REFER TO 3/P400 FOR WATER HEATER DETAIL.



1 BASEMENT DEMOLITION PLAN - PLUMBING

1/8" = 1'-0"



2 BASEMENT PLAN - PLUMBING

1/8" = 1'-0"

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DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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SHEET TITLE

BASEMENT PLAN - PLUMBING

SCALE

Scale: 1/8" = 1'-0"

SHEET NUMBER

P200

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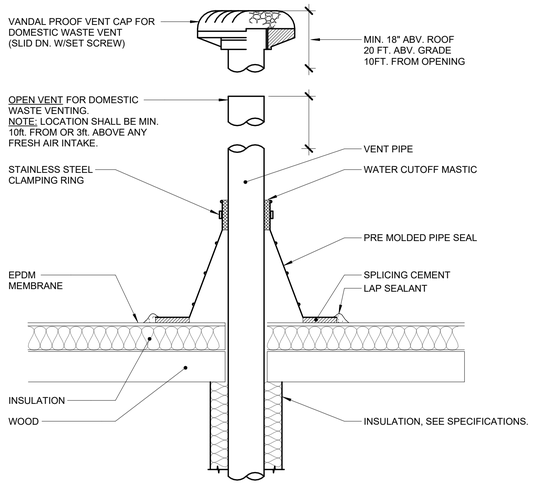
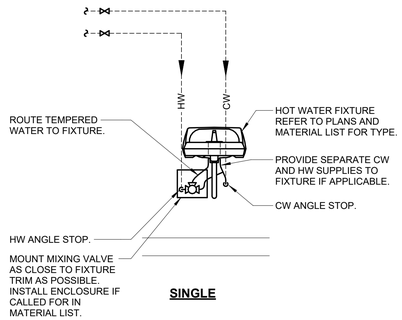


NOTES:

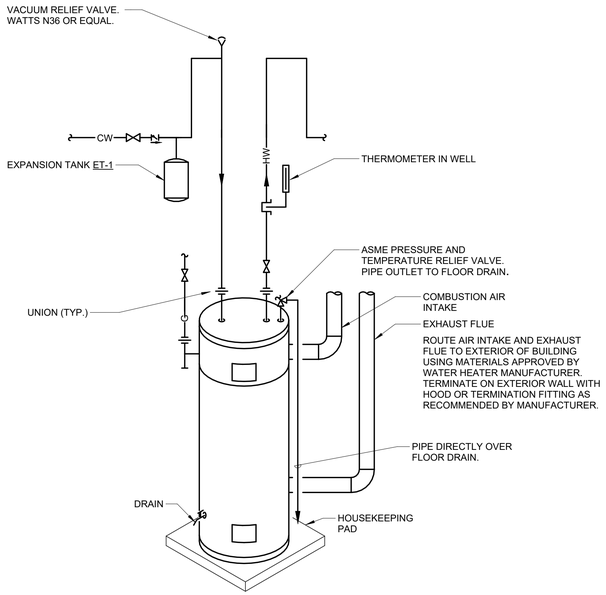
1. VENT PIPE SHALL BE A MINIMUM OF 4" DIAMETER UNLESS NOTED LARGER ON FLOOR PLANS. INCREASERS, IF REQUIRED TO TRANSITION TO THE LARGER VTR SIZE, MUST BE INSTALLED AT LEAST 12 INCHES BELOW THE THERMAL ENVELOPE OF THE BUILDING.
2. EXTEND VENT PIPE AT LEAST 7 FEET ABOVE ROOF LEVEL WHEN ROOF AREA IS INTENDED TO BE USED BY THE GENERAL PUBLIC. THIS INCLUDES PROMENADES, OBSERVATION DECKS, ETC. THIS IS NOT REQUIRED FOR ROOFS THAT ARE ACCESSIBLE BY MAINTENANCE PERSONEL ONLY.

1 VENT PIPE FLASHING
NO SCALE



SINGLE

2 LAVATORY MIXING VALVE
NO SCALE



3 WATER HEATER - GAS TANK
NO SCALE

PLUMBING MATERIAL LIST

TAG NAME	DESCRIPTION	MANUFACTURER AND MODEL
ET-1	EXPANSION TANK - WELDED STEEL CONSTRUCTION, ASME STAMPED, GUARANTEED AIRTIGHT AND LEAKPROOF, STAINLESS STEEL SYSTEM CONNECTION, HEAVY DUTY BUTYL DIAPHRAGM AND RIGID POLYPROPYLENE LINER MECHANICALLY BONDED TO TANK TO PROVIDE A 100% NON-CORROSIVE WATER RESERVOIR, DIAPHRAGM AND LINER SHALL BE APPROVED FOR USE IN POTABLE WATER SYSTEMS, ALL WETTED COMPONENTS OF FDA APPROVED MATERIALS. PROVIDE STANDARD SCHRADER AIR VALVE FOR FIELD CHARGING. TANK SHALL COMPLY WITH FEDERAL ACT S.3874. MINIMUM TANK VOLUME TO BE 6.4 GALLONS MINIMUM ACCEPTING VOLUME TO BE 3.2 GALLONS TANK SHALL HAVE A WORKING TEMPERATURE OF 200°F AND A WORKING PRESSURE OF 150 PSIG. FACTORY PRE-CHARGED FOR SHIPPING. FIELD CHARGE TANK TO MATCH FIELD VERIFIED STATIC SYSTEM PRESSURE.	EXPANSION TANK - AMTROL (THERM-X-TROL ST-12C), B&G (PTA), ELBI (DTS, DTL), TACO (PAX SERIES), WATTS (DETA), WESSELS (TTA)
FD-1	FLOOR DRAIN - CAST IRON BODY, NICKEL BRONZE ADJUSTABLE TOP, 5" ROUND, 2" BOTTOM OUTLET, FLASHING COLLAR. TRAP SEAL - 2", PLASTIC HOUSING WITH FLEXIBLE DIAPHRAGM, SEALING GASKETS, RECLOSES AND SEALS WHEN DISCHARGE IS COMPLETED, ASSE 1072.	FLOOR DRAIN - ZURN (Z-415), SMITH (2005), WADE (1100), JOSAM (30000), WATTS (FD-100), MIFAB (F1100), SUN (FD1000) TRAP SEAL - SURE SEAL (SS), PROVENT (TRAP GUARD), SMITH (QUAD CLOSE), GREEN DRAIN, MIFAB (MI-GARD), ZURN (Z1072)
L-1	LAVATORY - ACCESSIBLE, WALL MOUNTED, WHITE VITREOUS CHINA, 20"x18", 4" HIGH BACKSPLASH, FAUCET HOLES ON 4" CENTERS, DRILLED FOR CONCEALED ARM CARRIER. LAVATORY TRIM - SINGLE HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, CONVENTIONAL SPOUT WITH LAMINAR FLOW OUTLET, WASHERLESS PUSH-PULL LEVER HANDLE WITH SUPPLIES AT 4" CENTERS, CERAMIC DISC CARTRIDGE, PERFORATED GRID STRAINER WITH 1-1/4" 17 GAUGE TAILPIECE. MAXIMUM FLOW TO BE 0.5 GPM IN COMPLIANCE WITH ENERGY POLICY ACT OF 2005 AND ASME/ANSI STANDARD A112.18.1M. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. PROVIDE RESTRICTIVE DEVICE AS REQUIRED. MIXING VALVE - POINT-OF-USE ANTI-SCALD THERMOSTATIC MIXING VALVE FOR TEMPERED WATER CONTROL, ALL BRONZE/BRASS CONSTRUCTION, ROUGH FINISH, THREADED INLETS, TAMPER RESISTANT SETPOINT, 3/8" COMPRESSION INLETS AND OUTLETS, COLD WATER BYPASS IF USED WITH MIXING FAUCET. 0.5 GPM OUTPUT. UNIT TO MIX 140 DEGREE F HOT WATER SUPPLY AND 40 DEGREE F COLD WATER SUPPLY FOR 110 DEGREE F OUTLET. UNIT SHALL BE ASSE 1070 LISTED AND APPROVED. VALVE SHALL COMPLY WITH FEDERAL ACT S.3874. INSULATION KIT - PRE-MANUFACTURED FOR P-TRAP, STOP VALVES AND SUPPLY LINES. ACCESSORIES - QUARTER-TURN 3/8" CHROME PLATED HEAVY BRASS ANGLE SUPPLY LOOSE KEY STOPS, CHROME PLATED SOFT COPPER OR FLEXIBLE STAINLESS STEEL SUPPLY LINES, DRAIN AND OFFSET TAILPIECE, 1-1/4" 17 GAUGE CAST BRASS P-TRAP, SUPPORT CARRIER. MOUNT LAVATORY WITH SUPPORT CARRIER BOLTED SECURELY TO FLOOR. TOP OF RIM SHALL BE AT 34" ABOVE FLOOR IN COMPLIANCE WITH LATEST ADA STANDARD. PROVIDE 29" MINIMUM CLEARANCE FROM FLOOR TO BOTTOM OF APRON IN COMPLIANCE WITH LATEST ANSI A117.1 AND ADA STANDARDS. ARMAFLEX WITH TAPE IS NOT ACCEPTABLE IN LIEU OF INSULATION KIT.	LAVATORY - GERBER (12-654), KOHLER (K-2032), ZURN (Z5844) LAVATORY TRIM - DELTA (22C131), AMERICAN STANDARD (7385), CHICAGO FAUCET (420), KOHLER (K-15597), MOEN (8413), SPEAKMAN (S-3561), SYMMONS (S-20), T&S BRASS (B-2711-VF05), ZURN (Z7440-XL) MIXING VALVE- WATTS (LFUSG-B), LEONARD (170D-LF), LAWLER (TMM-1070T), ACORN CONTROLS (ST70), APOLLO (34DLF), POWERS (LFE480), SLOAN (MIX-135-A), SYMMONS (8210CK), WILKINS (ZW3870XLT) INSULATION KIT - TRUEBRO (LAV-GUARD), BROCAR PRODUCTS (TRAP WRAP), MCGUIRE (PROWRAP), PLUMBEREX (PRO-EXTREME)
MB-1	MOP BASIN - MOLDED STONE, WHITE WITH BLACK ACCENTS, 24"x24"x10", STAINLESS STEEL DRAIN WITH COMBINATION DOME STRAINER AND LINT BASKET, 3" OUTLET, VINYL BUMPER GUARD ON EXPOSED SIDES. TRIM - EXPOSED TWO HANDLE MIXING FAUCET, BRASS CONSTRUCTION, CHROME-PLATED FINISH, SINGLE WING HANDLES, 1/4 TURN CERAMIC DISC CARTRIDGE, 3/4" HOSE THREAD SPOUT WITH [ASSE 1053 RATED] INTEGRAL VACUUM BREAKER, WALL BRACE, PAIL HOOK, CHECK STOPS OR INLINE CHECK VALVES TO PREVENT THERMAL CROSSOVER. FAUCET SHALL COMPLY WITH FEDERAL ACT S.3874. ACCESSORIES - MOP HANGER, HOSE AND HOSE BRACKET, TRAP.	MOP BASIN - FIAT (MSB), WILLIAMS (MTB), SWAN (MS), ZURN (Z-1996), MUSTEE (63M) TRIM - DELTA (28C2383), AMERICAN STANDARD (8344.012), CHICAGO FAUCETS (897-CP), MOEN (8124), SPEAKMAN (SC-5812), SYMMONS (S-2490), ZURN (Z841M1-XL) MOP BASIN - FIAT (MSB), WILLIAMS (MTB), SWAN (MS), ZURN (Z-1996), MUSTEE (63M) TRIM - DELTA (28C2383), AMERICAN STANDARD (8344.012), CHICAGO FAUCETS (897-CP), MOEN (8124), SPEAKMAN (SC-5812), SYMMONS (S-2490), ZURN (Z841M1-XL)
WC-1	WATER CLOSET - ACCESSIBLE, FLOOR MOUNTED, TANK TYPE, WHITE VITREOUS CHINA, CLOSE COUPLED, SIPHON JET, ELONGATED BOWL, BOLT CAPS, 12" ROUGH-IN, FLOAT VALVE WITH VACUUM BREAKER, CHROME-PLATED TRIP LEVER, INSULATED TANK LINER 1.6 GALLONS PER FLUSH (MAXIMUM). SEAT - WHITE, EXTRA HEAVY, OPEN FRONT, INJECTION MOLDED SOLID PLASTIC, SELF-SUSTAINING HINGE, STAINLESS STEEL OR PLATED STEEL POSTS AND NUTS. ACCESSORIES - QUARTER-TURN 3/8" CHROME-PLATED HEAVY BRASS ANGLE SUPPLY WITH LOOSE-KEY STOP, CHROME-PLATED SOFT COPPER SUPPLY LINE. TOP OF SEAT SHALL BE AT 17"-19" ABOVE FINISHED FLOOR. FLUSH HANDLE SHALL BE LOCATED ON THE WIDE SIDE OF THE TOILET STALL AND OPERATE WITH NO GREATER THAN 5 LB FORCE IN COMPLIANCE WITH LATEST ADA STANDARDS. VERIFY EQUIPMENT REQUIREMENTS AND ROUGH-IN LOCATIONS.	WATER CLOSET - ZURN (Z5555-K), CRANE (3814), KOHLER (K-3979), ELJER (091-2175), GERBER (21-718), TOTO (CST744SL), NIAGARA PRO (C11.300.01 or C11.301.01) SEAT - BEMIS (1655SSCT), CHURCH (9500C), BENEKE (533), KOHLER (K-4666-C), OLSONITE (95), CENTOCO (550STSCCSS-001),
WCO-1	WALL CLEANOUT - END CAP, CAST IRON ACCESS BODY, GAS AND WATERTIGHT BRONZE OR BRASS THREADED PLUG, VANDAL RESISTANT ROUND STAINLESS STEEL ACCESS COVER, EXTENDED MACHINE SCREW.	ZURN (Z-1441), SMITH (4422), WADE (W-8480-R/8550), JOSAM (58600-CO), WATTS (CO-380-RD), MIFAB (C1450-RD)
WH-1	WATER HEATER - GAS FIRED, CONDENSING, VERTICAL, MINIMUM 94% EFFICIENT, SEALED COMBUSTION, METAL CABINET, BAKED ENAMEL FINISH, ASME STAMPED GLASS-LINED STEEL OR STAINLESS STEEL TANK, 160 PSI WORKING PRESSURE, FIBERGLASS OR FOAM INSULATION, BRASS WATER CONNECTIONS AND DRAIN VALVE, ASME APPROVED T&P RELIEF VALVE, MULTIPLE MAGNESIUM ANODE RODS, VENT PIPING KIT, HIGH TEMPERATURE GAS SHUT OFF, AUTOMATIC WATER THERMOSTAT, BUILT-IN GAS REGULATING VALVE, ADJUSTABLE TEMPERATURE RANGE, 3-YEAR WARRANTY, UL LISTED, COMPLIANT TO NAECA, ASHRAE 90.1 AND ASHRAE 90A. 50 GALLON CAPACITY, 40,000 BTUH INPUT NATURAL GAS, 42 GPH RECOVERY AT 90°F RISE. ELECTRICAL REQUIREMENTS - CIRCUIT FOR BLOWER AND CONTROLS, HARD-WIRED. SET WATER TEMPERATURE AT 140°F. SET SUPPLY GAS PRESSURE AT " W.C. CONDENSATE DRAIN NEUTRALIZATION TANK - RATED FOR MAXIMUM 4,000 MBH WATER HEATER AND 32 GPH CONDENSATE FLOW, POLYPROPYLENE RECTANGULAR TANK, 1"FNPT INLET AND OUTLET, REMOVABLE ACCESS COVER FOR CLEANING AND PELLET REPLACEMENT, 12.5 LBS PH NEUTRALIZING PELLETS.	WATER HEATER - A.O. SMITH (PROLINE), BOCK, BRADFORD WHITE, PVI, RHEEM NEUTRALIZATION TANK - JJM BOILER WORKS (NB-4), NUTRASAFE (CN4T)
WMF-1	WASHING MACHINE FIXTURE - WHITE POWDER COATED GALVANIZED STEEL ENCLOSURE, MAT2" CENTER DRAIN, TWO INDEXED 1/2" DOMESTIC VALVES WITH THREADED OUTLETS, INTEGRAL WATER HAMMER ARRESTORS. PROVIDE FLEXIBLE WATER AND WASTE LINES FOR FINAL CONNECTION TO EQUIPMENT.	GUY GRAY (MWB SERIES, WB200HA SERIES, SSWB3 SERIES)

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REVISIONS

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SHEET TITLE
PLUMBING DETAILS

SCALE
Scale: 12" = 1'-0"

SHEET NUMBER
P400

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22 05 00 BASIC PLUMBING REQUIREMENTS

SCOPE OF WORK
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE MECHANICAL WORK A FINISHED AND WORKING SYSTEM.

PLUMBING WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. FURNISH AND INSTALL ALL ITEMS LISTED IN THE PLUMBING MATERIAL LIST.
2. EXTEND EXISTING DOMESTIC WATER PIPING SYSTEM INCLUDING COLD, HOT, AND HOT WATER CIRCULATING PIPING WITHIN THE BUILDING. INSULATE ALL PIPING AS SPECIFIED.
3. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
4. REVISE AND/OR REPLACE WATER HEATERS.
5. EXTEND EXISTING SANITARY SEWER AND VENT SYSTEM.
6. FURNISH AND INSTALL SITE SANITARY SEWER PIPING, CLEANOUTS, AND MANHOLES.

HVAC WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
2. FURNISH AND INSTALL REFRIGERANT PIPING, ACCESSORIES, AND FINAL CHARGE OF REFRIGERANT.
3. FURNISH AND INSTALL CONDENSATE DRAIN PIPING FROM COOLING RELATED EQUIPMENT SUCH AS AIR HANDLERS AND COOLING COIL DRAIN PANS.
4. FURNISH AND INSTALL COMPLETE EXHAUST DUCTWORK SYSTEMS INCLUDING ALL FITTINGS, INSULATION, INLETS, AND FANS.
5. FURNISH AND INSTALL GAS FLUES, STACKS, AND BREECHINGS.
6. FURNISH AND INSTALL ALL TEMPERATURE CONTROL SYSTEMS.

ALL WORK THAT WILL PRODUCE EXCESSIVE NOISE OR INTERFERENCE WITH NORMAL BUILDING OPERATIONS, AS DETERMINED BY THE OWNER/LANDLORD, SHALL BE SCHEDULED WITH THE OWNER/LANDLORD. IT MAY BE NECESSARY TO SCHEDULE SUCH WORK DURING UNOCCUPIED HOURS. THE OWNER/LANDLORD RESERVES THE RIGHT TO DETERMINE WHEN RESTRICTED CONSTRUCTION HOURS WILL BE REQUIRED. CONTRACTOR SHALL COORDINATE WITH THE LANDLORD DURING THE BIDDING PROCESS.

ALL CONTRACTORS SHALL ESTABLISH UTILITY ELEVATIONS PRIOR TO FABRICATION AND SHALL COORDINATE THEIR MATERIAL AND EQUIPMENT WITH OTHER TRADES.

THE MECHANICAL CONTRACTOR (FIRE PROTECTION/PLUMBING/HVAC/TEMPERATURE CONTROLS CONTRACTOR) SHALL:

BE RESPONSIBLE FOR ALL WIRING NOT SHOWN ON ELECTRICAL DRAWINGS BUT REQUIRED FOR MECHANICAL SYSTEMS.

VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE UNITS ARE TO BE MODIFIED, MOVED, OR REPLACED. CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING NEW UNITS OR REPLACEMENT UNITS.

QUALITY ASSURANCE
THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING COMPLETE AND OPERATING SYSTEMS. THE CONTRACTOR ACKNOWLEDGES AND UNDERSTANDS THAT THE CONTRACT DOCUMENTS ARE A TWO-DIMENSIONAL REPRESENTATION OF A THREE-DIMENSIONAL OBJECT, SUBJECT TO HUMAN INTERPRETATION. THIS REPRESENTATION MAY INCLUDE IMPERFECT DATA, INTERPRETED CODES, UTILITY GUIDELINES, THREE-DIMENSIONAL CONFLICTS, AND REQUIRED FIELD COORDINATION ITEMS. SUCH DEFICIENCIES CAN BE CORRECTED WHEN IDENTIFIED PRIOR TO ORDERING MATERIAL AND STARTING INSTALLATION. THE CONTRACTOR AGREES TO CAREFULLY STUDY AND COMPARE THE INDIVIDUAL CONTRACT DOCUMENTS AND REPORT AT ONCE IN WRITING TO THE DESIGN TEAM ANY DEFICIENCIES THE CONTRACTOR MAY DISCOVER. THE CONTRACTOR FURTHER AGREES TO REQUIRE EACH SUBCONTRACTOR TO LIKEWISE STUDY THE DOCUMENTS AND REPORT AT ONCE ANY DEFICIENCIES DISCOVERED.

THE CONTRACTOR SHALL RESOLVE ALL REPORTED DEFICIENCIES WITH THE ARCHITECT/ENGINEER PRIOR TO AWARDING ANY SUBCONTRACTS, ORDERING MATERIAL, OR STARTING ANY WORK WITH THE CONTRACTOR'S OWN EMPLOYEES. ANY WORK PERFORMED PRIOR TO RECEIPT OF INSTRUCTIONS FROM THE DESIGN TEAM WILL BE DONE AT THE CONTRACTOR'S RISK.

ONLY PRODUCTS OF REPUTABLE MANUFACTURERS ARE ACCEPTABLE.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL EMPLOY ONLY WORKERS SKILLED IN THEIR TRADES.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

CODES AND STANDARDS
CONFORM TO ALL REQUIREMENTS OF THE CITY OF AMES CODES, LAWS, ORDINANCES AND OTHER REGULATIONS HAVING JURISDICTION.

CONFORM TO ALL STATE CODES.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION. IF THERE IS INSUFFICIENT TIME FOR THIS PROCEDURE, CONTRACTOR SHALL SUBMIT WITH THE PROPOSAL A SEPARATE PRICE TO MAKE THE SYSTEM COMPLY WITH THE CODES AND REGULATIONS.

ALL CHANGES TO THE SYSTEM MADE AFTER LETTING OF THE CONTRACT, TO COMPLY WITH CODES OR REQUIREMENTS OF INSPECTORS, SHALL BE MADE BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

IF THERE IS A DISCREPANCY BETWEEN MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS, THE MANUFACTURER'S RECOMMENDATIONS SHALL GOVERN.

ALL ROTATING SHAFTS AND/OR EQUIPMENT SHALL BE COMPLETELY GUARDED FROM ALL CONTACT. PARTIAL GUARDS AND/OR GUARDS THAT DO NOT MEET ALL APPLICABLE OSHA STANDARDS ARE NOT ACCEPTABLE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING THIS GUARDING IF IT IS NOT PROVIDED WITH THE EQUIPMENT SUPPLIED.

PERMITS AND FEES
PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE APPROVED OR LISTED BY UNDERWRITER'S LABORATORIES, INC.

22 05 00 BASIC PLUMBING REQUIREMENTS (CONT.)

SUBMITTALS
SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

1. SUBMITTALS LIST:

22 05 29	HANGERS AND SUPPORTS
22 07 19	PLUMBING PIPING INSULATION
22 10 00	PLUMBING PIPING SYSTEMS AND VALVES
22 10 23	NATURAL GAS AND PROPANE PIPING SYSTEMS

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS BASED ON APPLICABLE SPECIFICATION SECTION. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

PRODUCT DELIVERY, STORAGE, AND HANDLING
EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO MATERIALS. STORE MATERIALS ON THE SITE TO PREVENT DAMAGE. KEEP MATERIALS CLEAN, DRY AND FREE FROM HARMFUL CONDITIONS. IMMEDIATELY REMOVE ANY MATERIALS THAT BECOME WET OR THAT ARE SUSPECTED OF BECOMING CONTAMINATED WITH MOLD OR OTHER ORGANISMS.

KEEP ALL BEARINGS PROPERLY LUBRICATED AND ALL BELTS PROPERLY TENSIONED AND ALIGNED.

COORDINATE THE INSTALLATION OF HEAVY AND LARGE EQUIPMENT WITH THE GENERAL CONTRACTOR AND/OR OWNER. IF THE MECHANICAL CONTRACTOR DOES NOT HAVE PRIOR DOCUMENTED EXPERIENCE IN RIGGING AND LIFTING SIMILAR EQUIPMENT, HE/SHE SHALL CONTRACT WITH A QUALIFIED LIFTING AND RIGGING SERVICE THAT HAS SIMILAR DOCUMENTED EXPERIENCE. FOLLOW ALL EQUIPMENT LIFTING AND SUPPORT GUIDELINES FOR HANDLING AND MOVING.

CONTRACTOR IS RESPONSIBLE FOR MOVING EQUIPMENT INTO THE BUILDING AND/OR SITE. CONTRACTOR SHALL REVIEW SITE PRIOR TO BID FOR PATH LOCATION AND ANY REQUIRED BUILDING MODIFICATIONS TO ALLOW MOVEMENT OF EQUIPMENT. CONTRACTOR SHALL COORDINATE HIS/HER WORK WITH OTHER TRADES.

WARRANTY
PROVIDE MINIMUM ONE-YEAR WARRANTY COMMENCING ON DATE OF FINAL ACCEPTANCE FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. WARRANTY REQUIREMENTS SHALL EXTEND TO CORRECTION, WITHOUT COST TO OWNER, OF ALL WORK FOUND TO BE DEFECTIVE OR NONCONFORMING TO THE CONTRACT DOCUMENTS. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION
WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A BID IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

OBSERVATION OF WORK
THE CONTRACTOR SHALL PROVIDE SEVEN (7) CALENDAR DAYS' NOTICE TO THE ARCHITECT/ENGINEER PRIOR TO COVERING INTERIOR PARTITIONS AND CHASES AND INSTALLING HARD OR SUSPENDED CEILINGS AND SOFFITS.

ALL WORK ABOVE THE CEILINGS MUST BE COMPLETE PRIOR TO THE ARCHITECT/ENGINEER'S REVIEW. THIS INCLUDES, BUT IS NOT LIMITED TO:
1. PIPE INSULATION IS INSTALLED AND FULLY SEALED.
2. PIPE WALL PENETRATIONS ARE SEALED.
3. PIPE IDENTIFICATION AND VALVE TAGS ARE INSTALLED.

IN ORDER TO PREVENT THE FINAL JOBSITE OBSERVATION FROM OCCURRING TOO EARLY, THE CONTRACTOR SHALL REVIEW THE COMPLETION STATUS OF THE PROJECT AND CERTIFY IN WRITING THAT THE JOB IS READY FOR THE FINAL JOBSITE OBSERVATION.

PROJECT CLOSEOUT
SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS INCLUDING REPRODUCIBLE DRAWINGS COMPLETED IN REVIT, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, AND INSPECTION BY STATE BOILER INSPECTOR.

OPERATION AND MAINTENANCE MANUALS
SUBMIT AN ELECTRONIC COPY OF THE O&M MANUALS TO THE OWNER. OPERATION AND MAINTENANCE DATA SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR THE CARE, MAINTENANCE, AND OPERATION OF THE EQUIPMENT AND SYSTEMS. INSTRUCTION BOOKS, CARDS, MANUALS FURNISHED WITH THE EQUIPMENT SHALL BE INCLUDED.

ALL TEXT SHALL BE SEARCHABLE AND BOOKMARKS SHALL BE USED, DIVIDING INFORMATION BY SPECIFICATION SECTION.

RECORD DOCUMENTS
MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS; CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB, AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING
THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

END OF SECTION

22 05 05 PLUMBING DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.

WHERE WALLS, CEILINGS, ETC., ARE SHOWN AS BEING REMOVED ON GENERAL DRAWINGS, THE CONTRACTOR SHALL REMOVE ALL MECHANICAL EQUIPMENT, DEVICES, FIXTURES, PIPING, DUCTS, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, PARTITIONS, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL REMOVE, STORE, AND REPLACE EQUIPMENT, DEVICES, FIXTURES, PIPES, DUCTS, SYSTEMS, ETC.

VERIFY THAT ABANDONED UTILITIES SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND SERVICES TO FACILITIES OR EQUIPMENT THAT SHALL REMAIN IN OPERATION FOLLOWING DEMOLITION.

COORDINATE WORK WITH ALL OTHER CONTRACTORS AND THE LANDLORD/OWNER. SCHEDULE REMOVAL OF EQUIPMENT TO AVOID CONFLICTS.

THIS CONTRACTOR SHALL VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE EQUIPMENT IS SCHEDULED TO BE REPLACED OR MODIFIED, PRIOR TO ORDERING NEW EQUIPMENT.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION
DISCONNECT MECHANICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.

PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON OPERATING EQUIPMENT, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.

EXISTING HEATING SYSTEM: MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR SERVICE. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM THE OWNER AT LEAST 48 HOURS BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MINIMIZE OUTAGE DURATION.

DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK
DEMOLISH AND EXTEND EXISTING MECHANICAL WORK UNDER PROVISIONS OF DIVISION 2 AND THIS SECTION. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. REMOVE ABANDONED DUCTS AND PIPING TO SOURCE OF SUPPLY AND/OR MAIN LINES.

REMOVE EXPOSED ABANDONED PIPES AND DUCTS, INCLUDING ABANDONED PIPES AND DUCTS ABOVE ACCESSIBLE CEILINGS. CUT DUCTS FLUSH WITH WALLS AND FLOORS, CAP DUCT THAT REMAINS, AND PATCH SURFACES. CUT PIPES ABOVE CEILINGS, BELOW FLOORS AND BEHIND WALLS. CAP REMAINING LINES. REPAIR BUILDING CONSTRUCTION TO MATCH ORIGINAL. REMOVE ALL CLAMPS, HANGERS, SUPPORTS, ETC. ASSOCIATED WITH PIPE AND DUCT REMOVAL.

REMOVE UNUSED SECTIONS OF SUPPLY AND RETURN AIR DUCTWORK BACK TO MAINS. PATCH OPENING WITH SHEET METAL AND SEAL AIRTIGHT. PATCH EXISTING INSULATION TO MATCH EXISTING. WHERE EXISTING DUCTWORK IS TO BE CAPPED AND REUSED, LOCATE THE END CAP WITHIN 6" OF THE LAST BRANCH. END CAPS SHALL BE 3" PRESSURE CLASS AND SEAL CLASS "A".

DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS WHICH REMAIN. MODIFY INSTALLATION OR PROVIDE ACCESS PANELS AS APPROPRIATE.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.

EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING INSTALLATIONS, OR AS SPECIFIED.

PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN DEMOLISHED EQUIPMENT AND AS REQUIRED FOR EXTENSION OF EXISTING EQUIPMENT.

CUTTING AND PATCHING
THIS CONTRACTOR IS RESPONSIBLE FOR ALL PENETRATIONS OF EXISTING CONSTRUCTION REQUIRED TO COMPLETE THE WORK OF THIS PROJECT. PENETRATIONS IN EXISTING CONSTRUCTION SHOULD BE REVIEWED CAREFULLY PRIOR TO PROCEEDING WITH ANY WORK.

PENETRATIONS SHALL BE NEAT AND CLEAN WITH SMOOTH AND/OR FINISHED EDGES. CORE DRILL WHERE POSSIBLE FOR CLEAN OPENING.

REPAIR EXISTING CONSTRUCTION AS REQUIRED AFTER PENETRATION IS COMPLETE TO RESTORE TO ORIGINAL CONDITION. USE SIMILAR MATERIALS AND MATCH ADJACENT CONSTRUCTION UNLESS OTHERWISE NOTED OR AGREED TO BY THE ARCHITECT/ENGINEER PRIOR TO START OF WORK.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEANING AND REPAIR
CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED. CLEAN ALL SYSTEMS ADJACENT TO PROJECT WHICH ARE AFFECTED BY THE DUST AND DEBRIS CAUSED BY THIS CONSTRUCTION.

MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE LANDLORD/OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE LANDLORD/OWNER IN A LOCATION COORDINATED WITH THE LANDLORD/OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE LANDLORD/OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

SPECIAL REQUIREMENTS
REVIEW LOCATIONS OF ALL NEW PENETRATIONS IN EXISTING FLOOR SLABS OR WALLS. DETERMINE CONSTRUCTION TYPE AND REVIEW FOR POSSIBLE INTERFERENCES. BRING ALL CONCERNS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING.

END OF SECTION

22 05 29 SUPPORTS AND ANCHORS

SECTION INCLUDES
HANGERS, SUPPORTS, AND ASSOCIATED ANCHORS
EQUIPMENT BASES AND SUPPORTS
SLEEVES AND SEALS
FLASHING AND SEALING OF EQUIPMENT AND PIPE STACKS
CUTTING OF OPENINGS
ESCUTCHEON PLATES AND TRIM

HANGER RODS
HANGER RODS FOR SINGLE ROD HANGERS SHALL CONFORM TO THE FOLLOWING:

PIPE SIZE	HANGER ROD	DIAMETER
	COLUMN #1	COLUMN #2
2" AND SMALLER	3/8"	3/8"
2-1/2" THROUGH 3-5/8"	1/2"	1/2"

COLUMN #1: STEEL PIPE.
COLUMN #2: COPPER, PLASTIC AND FIBERGLASS REINFORCED PIPE.

RODS FOR DOUBLE ROD HANGERS MAY BE REDUCED ONE SIZE. MINIMUM ROD DIAMETER IS 3/8 INCHES.

HANGER RODS AND ACCESSORIES USED IN MECHANICAL SPACES OR OTHERWISE DRY AREAS SHALL HAVE ASTM B633 ELECTRO-PLATED ZINC FINISH.

PIPE HANGERS AND SUPPORTS
ALL PIPE HANGERS, CLAMPS, AND SUPPORTS SHALL CONFORM TO MANUFACTURERS STANDARDIZATION SOCIETY MSS_SP_58 AND 127 (WHERE APPLICABLE).

OVERSIZE ALL HANGERS, CLAMPS, AND SUPPORTS ON INSULATED PIPING TO ALLOW INSULATION AND JACKET TO PASS THROUGH UNBROKEN. THIS APPLIES TO BOTH HOT AND COLD PIPES.

FERROUS HOT PIPING 2-1/2 INCHES AND LARGER SHALL HAVE STEEL SADDLES TACK WELDED TO THE PIPE AT EACH SUPPORT AT A DEPTH NOT LESS THAN THE SPECIFIED INSULATION. FACTORY FABRICATED INSERTS MAY BE USED.

ACCEPTABLE PRODUCTS:
ANVIL - FIG. 160, 161, 162, 163, 164, 165
COOPER/B-LINE - FIG. 3160, 3161, 3162, 3163, 3164, 3165
ERICO - MODEL 630, 631, 632, 633, 634, 635
NIBCO/TOLCO - FIG. 260-1, 261-1 1/2, 262-2, 263-2 1/2, 264-3, 265-4

ON ALL INSULATED PIPING, PROVIDE A SEMI-CYLINDRICAL METALLIC SHIELD AND FIRE RESISTANT VAPOR BARRIER JACKET.

AS AN ALTERNATIVE TO SEPARATE PIPE INSULATION INSERT AND SADDLE, PROPERLY SIZED INTEGRAL RIGID INSULATION SECTIONS MAY BE USED FOR THIS APPLICATION.

ACCEPTABLE PRODUCTS:
COOPER/B-LINE - FIG. B3380 THROUGH B3384
PIPE SHIELDS - A1000, A2000
ERICO - MODEL 124, 127

SUPPORT AND LATERALLY BRACE VERTICAL PIPES AT EVERY FLOOR LEVEL IN MULTI_STORY STRUCTURES, AND MORE FREQUENTLY WHEN REQUIRED BY APPLICABLE CODES (THE ILLINOIS PLUMBING CODE REQUIRES 10 FOOT MAXIMUM SPACING FOR SUPPORT OF COPPER RISERS), BUT NEVER AT INTERVALS OVER 15 FEET. SUPPORT VERTICAL PIPES WITH RISER CLAMPS INSTALLED BELOW HUBS, COUPLINGS OR LUGS. PROVIDE SUFFICIENT FLEXIBILITY TO ACCOMMODATE EXPANSION AND CONTRACTION WITHOUT COMPROMISING FIRE BARRIER PENETRATIONS AND OTHER FIXED TAKE-OFF LOCATIONS.

ACCEPTABLE PRODUCTS:
ANVIL - FIG. CT121
COOPER/B-LINE - FIG. B3373CT
ERICO - MODEL 510NIBCO/TOLCO - FIG. 82

PLACE RESTRAINED NEOPRENE MOUNTS BENEATH VERTICAL PIPE RISER CLAMPS TO PREVENT SWEATING OF COLD PIPES. INSULATE OVER MOUNTS.

ACCEPTABLE PRODUCTS: MASON RBA, RCA, OR BR.

HANGERS IN DIRECT CONTACT WITH COPPER PIPE SHALL BE COATED WITH PLASTIC WITH APPROPRIATE TEMPERATURE RANGE. HYDRA-ZORB CLAMPS ARE PERMITTED FOR THIS APPLICATION FOR BARE PIPES WITHIN THEIR TEMPERATURE LIMITS OF -65F TO +275F.

UNLESS OTHERWISE INDICATED, HANGERS SHALL BE AS FOLLOWS:

CLEVIS TYPE:
SERVICE: BARE METAL PIPE, RIGID PLASTIC PIPE, INSULATED COLD PIPE, INSULATED HOT PIPE - 3 INCHES & SMALLER
ACCEPTABLE PRODUCTS BARE STEEL, PLASTIC, INSULATED PIPE BARE COPPER PIPE
ANVIL FIG. 260
COOPER/B-LINE FIG. 3100 FIG. B3100C
ERICO MODEL 400
NIBCO/TOLCO FIG. 1 FIG. 81PVC2.

CONTINUOUS CHANNEL WITH CLEVIS TYPE:
SERVICE: PLASTIC TUBING, FLEXIBLE HOSE, SOFT COPPER TUBING
ACCEPTABLE PRODUCTS:
COOPER/B-LINE - FIG. B3106, WITH FIG. B3106V
ERICO - MODEL 104, WITH MODEL 104V
NIBCO/TOLCO - FIG. 1V

ADJUSTABLE SWIVEL RING TYPE:
SERVICE: BARE METAL PIPE - 4 INCHES AND SMALLER
ACCEPTABLE PRODUCTS BARE STEEL PIPE BARE COPPER PIPE
ANVIL FIG. 69
COOPER/B-LINE FIG. B3170NF FIG. B3170CTC
ERICO MODEL FCN 102A0 SERIES
NIBCO/TOLCO FIG. 200 FIG. 203

SUPPORT MAY BE FABRICATED FROM U-CHANNEL STRUT OR SIMILAR SHAPES. PIPING LESS THAN 4" IN DIAMETER SHALL BE SECURED TO STRUT WITH CLAMPS OF PROPER DESIGN AND CAPACITY AS REQUIRED TO MAINTAIN SPACING AND ALIGNMENT. STRUT SHALL BE INDEPENDENTLY SUPPORTED FROM HANGER DROPS OR BUILDING STRUCTURE. SIZE AND SUPPORT SHALL BE PER MANUFACTURER'S INSTALLATION REQUIREMENTS FOR STRUCTURAL SUPPORT OF PIPING. CLAMPS SHALL NOT INTERRUPT PIPING INSULATION.

1. STRUT USED IN MECHANICAL SPACES OR OTHERWISE DRY AREAS SHALL HAVE ASTM B633 ELECTRO-PLATED ZINC FINISH.
2. STRUT USED IN DAMP AREAS LISTED IN HANGER RODS SHALL HAVE ASTM A123 HOT-DIP GALVANIZED FINISH APPLIED AFTER FABRICATION.

UNLESS OTHERWISE INDICATED, PIPE SUPPORTS FOR USE WITH STRUTS SHALL BE AS FOLLOWS:

CLAMP TYPE:
SERVICE: BARE METAL PIPE, RIGID PLASTIC PIPE, INSULATED COLD PIPE, INSULATED HOT PIPE - 3 INCHES AND SMALLER
a. CLAMPS IN DIRECT CONTACT WITH COPPER PIPE SHALL BE PLASTIC COATED.
b. PIPES SUBJECT TO EXPANSION AND CONTRACTION SHALL HAVE CLAMPS SLIGHTLY OVERSIZED TO ALLOW LIMITED PIPE MOVEMENT.
ACCEPTABLE PRODUCTS BARE STEEL, PLASTIC, INSULATED PIPE BARE COPPER PIPE
UNISTRUT FIG. P1100 OR P2500
COOPER/B-LINE FIG. B2000 OR B2400 FIG. BVT
NIBCO/TOLCO FIG. A-14 OR 2STR

MASONRY ANCHORS: FASTEN TO CONCRETE MASONRY UNITS WITH EXPANSION ANCHORS OR SELF_TAPPING MASONRY SCREWS. FOR EXPANSION ANCHORS INTO HOLLOW CONCRETE BLOCK, USE SLEEVE-TYPE ANCHORS DESIGNED FOR THE SPECIFIC APPLICATION. DO NOT FASTEN IN MASONRY JOINTS. DO NOT USE POWDER ACTUATED FASTENERS, WOODEN PLUGS, OR PLASTIC INSERTS.

WALL SUPPORTS SHALL BE USED WHERE VERTICAL HEIGHT OF STRUCTURE EXCEEDS MINIMUM SPACING REQUIREMENTS. INSTALL WALL SUPPORTS AT SAME SPACING AS HANGERS OR STRUT SUPPORTS ALONG VERTICAL LENGTH OF PIPE RUNS.

22 05 29 SUPPORTS AND ANCHORS (CONT.)

FOUNDATIONS, BASES, AND SUPPORTS
FURNISH AND INSTALL FOUNDATIONS, BASES, AND SUPPORTS (NOT SPECIFICALLY INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS OF EITHER THE GENERAL CONSTRUCTION OR MECHANICAL WORK AS PROVIDED BY ANOTHER CONTRACTOR) FOR MECHANICAL EQUIPMENT.

ALL CONCRETE FOUNDATIONS, BASES AND SUPPORTS, SHALL BE REINFORCED. ALL STEEL BASES AND SUPPORTS SHALL RECEIVE A PRIME COAT OF ZINC CHROMATE OR RED METAL PRIMER. AFTER COMPLETION OF WORK, GIVE STEEL SUPPORTS A FINAL COAT OF GRAY ENAMEL.

CONCRETE BASES (HOUSEKEEPING PADS)
1. UNLESS SHOWN OTHERWISE ON THE DRAWINGS, CONCRETE BASES SHALL BE NOMINAL 4 INCHES THICK AND SHALL EXTEND 3 INCHES ON ALL SIDES OF THE EQUIPMENT (6 INCHES LARGER THAN FACTORY BASE).
2. WHERE A BASE IS LESS THAN 12 INCHES FROM A WALL, EXTEND THE BASE TO THE WALL TO PREVENT A "DIRT_TRAP".
3. CONCRETE MATERIALS AND WORKMANSHIP REQUIRED FOR THE CONTRACTOR'S WORK SHALL BE PROVIDED BY CONTRACTOR. MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE APPLICABLE STANDARDS OF THE PORTLAND CEMENT ASSOCIATION. REINFORCE WITH 6"X6", WT.4-W1.4 WELDED WIRE FABRIC. CONCRETE SHALL WITHSTAND 3,000 POUNDS COMPRESSION PER SQUARE INCH AT 28 DAYS.
4. EQUIPMENT REQUIRING BASES IS AS FOLLOWS:
a. WATER HEATER

SUPPORTS
PROVIDE SUFFICIENT CLIPS, INSERTS, HANGER

22 05 29 SUPPORTS AND ANCHORS (CONT.)

FINISH
PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.

HVAC SUPPORTS AND ANCHORS INSTALLATION
INSTALL ALL ITEMS PER MANUFACTURER'S INSTRUCTIONS. COORDINATE THE LOCATION AND METHOD OF SUPPORT OF PIPING SYSTEMS WITH ALL INSTALLATIONS UNDER OTHER DIVISIONS AND SECTIONS OF THE SPECIFICATIONS.

WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDING.

SUPPORT REQUIREMENTS
INSTALL ROOF PIPE SUPPORTS TO RESIST WIND MOVEMENT PER MANUFACTURER'S RECOMMENDATIONS. METHOD OF SECURING BASE TO ROOF SHALL BE COMPATIBLE WITH ROOFING MATERIALS.

WHERE BUILDING STRUCTURAL STEEL IS FIREPROOFED, ALL HANGERS, CLAMPS, AUXILIARY STEEL, ETC., WHICH ATTACH TO IT SHALL BE INSTALLED PRIOR TO APPLICATION OF FIREPROOFING. REPAIR ALL FIREPROOFING DAMAGED DURING PIPE INSTALLATION.

SET ALL CONCRETE INSERTS IN PLACE BEFORE POURING CONCRETE.

FURNISH, INSTALL AND PRIME ALL AUXILIARY STRUCTURAL STEEL FOR SUPPORT OF PIPING SYSTEMS THAT ARE NOT SHOWN ON THE DRAWINGS AS BEING BY OTHERS.

INSTALL HANGERS AND SUPPORTS COMPLETE WITH LOCK NUTS, CLAMPS, RODS, BOLTS, COUPLINGS, SWIVELS, INSERTS AND REQUIRED ACCESSORIES.

HANGERS FOR HORIZONTAL PIPING SHALL HAVE ADEQUATE MEANS OF VERTICAL ADJUSTMENT FOR ALIGNMENT.

PIPE REQUIREMENTS
SUPPORT ALL PIPING AND EQUIPMENT, INCLUDING VALVES, STRAINERS, TRAPS AND OTHER SPECIALTIES AND ACCESSORIES TO AVOID OBJECTIONABLE OR EXCESSIVE STRESS, DEFLECTION, SWAYING, SAGGING OR VIBRATION IN THE PIPING OR BUILDING STRUCTURE DURING ERECTION, CLEANING, TESTING AND NORMAL OPERATION OF THE SYSTEMS.

DO NOT, HOWEVER, RESTRAIN PIPING TO CAUSE IT TO SNAKE OR BUCKLE BETWEEN SUPPORTS OR TO PREVENT PROPER MOVEMENT DUE TO EXPANSION AND CONTRACTION.

SUPPORT PIPING AT EQUIPMENT AND VALVES SO THEY CAN BE DISCONNECTED AND REMOVED WITHOUT FURTHER SUPPORTING THE PIPING.

PIPING SHALL NOT INTRODUCE STRAINS OR DISTORTION TO CONNECTED EQUIPMENT.

PARALLEL HORIZONTAL PIPES MAY BE SUPPORTED ON TRAPEZE HANGERS MADE OF STRUCTURAL SHAPES AND HANGER RODS; OTHERWISE, PIPES SHALL BE SUPPORTED WITH INDIVIDUAL HANGERS.

TRAPEZE HANGERS MAY BE USED WHERE DUCTS INTERFERE WITH NORMAL PIPE HANGING.

PROVIDE ADDITIONAL SUPPORTS WHERE PIPE CHANGES DIRECTION, ADJACENT TO FLANGED VALVES AND STRAINERS, AT EQUIPMENT CONNECTIONS AND HEAVY FITTINGS.

PROVIDE AT LEAST ONE HANGER ADJACENT TO EACH JOINT IN GROOVED END STEEL PIPE WITH MECHANICAL COUPLINGS.

PROVIDED THE INSTALLATION COMPLIES WITH ALL LOADING REQUIREMENTS OF TRUSS AND JOIST MANUFACTURERS, THE FOLLOWING PRACTICES ARE ACCEPTABLE:
1. LOADS OF 100 LBS. OR LESS MAY BE ATTACHED ANYWHERE ALONG THE TOP OR BOTTOM CHORDS OF TRUSSES OR JOISTS WITH A MINIMUM 3' SPACING BETWEEN LOADS.
2. LOADS GREATER THAN 100 LBS. MUST BE HUNG CONCENTRICALLY AND MAY BE HUNG FROM TOP OR BOTTOM CHORD, PROVIDED ONE OF THE FOLLOWING CONDITIONS IS MET:
a. THE HANGER IS ATTACHED WITHIN 6" FROM A WEB/CHORD JOINT.
b. ADDITIONAL L2X2X1/4 WEB REINFORCEMENT IS INSTALLED PER MANUFACTURER'S REQUIREMENTS.
3. IT IS PROHIBITED TO CANTILEVER A LOAD USING AN ANGLE OR OTHER STRUCTURAL COMPONENT THAT IS ATTACHED TO A TRUSS OR JOIST IN SUCH A FASHION THAT A TORSIONAL FORCE IS APPLIED TO THAT STRUCTURAL MEMBER.
4. IF CONDITIONS CANNOT BE MET, COORDINATE INSTALLATION WITH TRUSS OR JOIST MANUFACTURER AND CONTACT ARCHITECT/ENGINEER.

DO NOT EXCEED 25 LBS. PER HANGER AND A MINIMUM SPACING OF 2'-0 " ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LBS. LOAD AND 2'-0 " SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING WILL NEED TO BE ADDED.

DO NOT EXCEED THE MANUFACTURER'S RECOMMENDED MAXIMUM LOAD FOR ANY HANGER OR SUPPORT.

SPACING OF HANGERS SHALL NOT EXCEED THE COMPRESSIVE STRENGTH OF THE INSULATION INSERTS, AND IN NO CASE SHALL EXCEED THE FOLLOWING:

STEEL (STD. WEIGHT OR HEAVIER - VAPOR SERVICE):

PIPE MATERIAL	MAXIMUM SPACING
1_1/4" AND UNDER	9'_0"
1_1/2"	12'_0"
2" & LARGER	12'_0"

HARD DRAWN COPPER & BRASS (LIQUID SERVICE):

PIPE MATERIAL	MAXIMUM SPACING
3/4" AND UNDER	5'_0"
1"	6'_0"
1_1/4"	7'_0"
1_1/2"	8'_0"
2"	8'_0"
2_1/2"	9'_0"
3"	10'_0"
4"	12'_0"
6"	12'_0"

HARD DRAWN COPPER & BRASS (VAPOR SERVICE):

PIPE MATERIAL	MAXIMUM SPACING
3/4" & UNDER	7'_0"
1"	8'_0"
1_1/4"	9'_0"
1_1/2"	10'_0"
2"	11'_0"
2_1/2" & LARGER	12'_0"

FLEXIBLE PLASTIC PIPE, FLEXIBLE HOSE, AND SOFT COPPER TUBING:
a. CONTINUOUS CHANNEL WITH HANGERS MAXIMUM 8'-0 " O.C.
6. INSTALLATION OF HANGERS SHALL CONFORM TO MSS SP-58 AND THE APPLICABLE PLUMBING CODE.

END OF SECTION

22 10 00 PLUMBING PIPING

SECTION INCLUDES
PIPE AND PIPE FITTINGS
VALVES
DOMESTIC WATER PIPING SYSTEM
SANITARY DRAINAGE AND VENT PIPING SYSTEM

QUALITY ASSURANCE
VALVES: MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY. REMANUFACTURED VALVES ARE NOT ACCEPTABLE.

WELDING MATERIALS AND PROCEDURES: CONFORM TO ASME CODE AND APPLICABLE STATE LABOR REGULATIONS.

WELDERS CERTIFICATION: IN ACCORDANCE WITH ANSI/ASME SEC 9 OR ANSI/AWS D1.1.

PIPING, FITTINGS, VALVES, AND FLUX FOR POTABLE WATER SYSTEMS: ALL COMPONENTS SHALL BE LEAD FREE PER FEDERAL ACT S.3874, REDUCTION OF LEAD IN DRINKING WATER ACT.

CAST IRON PIPE:
CAST IRON; STANDARD WEIGHT; NO-HUB SLEEVE GASKETS:
1. STANDARD WEIGHT NO-HUB CAST IRON SOIL PIPE, BITUMINOUS CORROSION PROTECTIVE COATING INSIDE AND OUTSIDE, CISPI 301 OR ASTM A888.
2. DESIGN PRESSURE: GRAVITY MAXIMUM DESIGN TEMPERATURE: 180°F (82° C)
3. JOINTS: ASTM C1540, FM 1680, AND ASTM C-564.
4. ADAPTERS: TRANSITION FROM CAST IRON SOIL PIPE TO OTHER PIPE MATERIALS WITH MANUFACTURED ADAPTERS SPECIFICALLY FOR THE APPLICATION. ADAPTER MUST MEET THE SAME REQUIREMENTS AS THE JOINTS LISTED ABOVE. ASTM C1460. STICKER IDENTIFYING TRANSITION FITTING APPLICATION MUST BE VISIBLE TO VIEW. FOR EXAMPLE, THE MOST COMMONLY USED TRANSITION FITTING FROM CAST IRON NO-HUB TO PVC WOULD BE THE HUSKY SD-4200 SERIES.

COPPER PIPE:
COPPER PIPE; TYPE L; SOLDER JOINTS:
PIPE: TYPE L HARD DRAWN SEAMLESS COPPER TUBE, ASTM B88.
1. DESIGN PRESSURE: 175 PSI (1210 KPA); MAXIMUM DESIGN TEMPERATURE: 200°F (93°C).
2. JOINTS: SOLDER WITH 100% LEAD-FREE SOLDER AND FLUX, ASTM B32.
3. FITTINGS: WROUGHT COPPER SOLDER JOINT, ANSI B16.22.
COPPER PIPE; TYPE L; MECHANICAL PRESS CONNECTION:
1. PIPE: TYPE L HARD DRAWN SEAMLESS COPPER TUBE, ASTM B88.
2. DESIGN PRESSURE: 175 PSI (1210 KPA); MAXIMUM DESIGN TEMPERATURE: 200°F (93°C).
3. JOINTS: MECHANICAL PRESS CONNECTION.
4. FITTINGS: COPPER, ANSI B-16.22, WITH EMBEDDED EPDM O-RING / SEALING ELEMENT ENGINEERED FOR THIS APPLICATION, NSF-61.
5. FITTING IDENTIFICATION: PRESS ENDS SHALL PROVIDE THE ABILITY TO IDENTIFY AN UNPRESSED FITTING FROM THE FLOOR PRIOR TO TESTING. THE FUNCTION OF THIS FEATURE IS TO PROVIDE THE INSTALLER QUICK AND EASY IDENTIFICATION OF CONNECTIONS THAT HAVE NOT BEEN PRESSED PRIOR TO PUTTING THE SYSTEM INTO OPERATION.
6. SPECIAL REQUIREMENTS: MECHANICAL PRESS FITTING MANUFACTURER SHALL PROVIDE CONTRACTOR TRAINING PRIOR TO INSTALLATION.
7. MANUFACTURERS:
a. VIEGA PROPRESS
b. APOLLO PRESS, A DIVISION OF AALBERTS - IPS
c. NIBCO PRESS SYSTEM FITTINGS AND VALVES
d. MERIT BRASS
e. MUELLER STREAMLINE PRS

PLASTIC PIPE
CROSS-LINKED POLYETHYLENE (PEX); COLD EXPANSION JOINT:
1. TUBING: CROSS-LINKED POLYETHYLENE (PEX-A OR PEX-B), SDR-9, ASTM F876, NSF CERTIFIED
2. DESIGN PRESSURE/TEMPERATURE: 100 PSIG (690 KPA GAUGE) AT 180°F (82°C).
3. JOINTS: BENDING THE TUBING GREATER THAN EIGHT (8) TIMES THE OUTSIDE DIAMETER SHALL BE PERMITTED. BENDS LESS THAN EIGHT (8) TIMES THE OUTSIDE DIAMETER SHALL BE BARBED INSERTION FITTINGS PROVIDED BY THE MANUFACTURER.
4. FITTINGS: COLD EXPANSION JOINT COMPATIBLE WITH ENGINEERED POLYMER CONSTRUCTION. SYSTEM SHALL CONFORM TO ASTM F1960.
5. LIMITATIONS: SHALL NOT BE USED IN A RETURN AIR PLENUM UNLESS SPECIFICALLY LISTED TO ASTM E84/UL723.
6. TUBING: VIRGIN RIGID CHLORINATED POLYVINYL CHLORIDE (CPVC), COPPER TUBE SIZE (CTS) MANUFACTURED TO STANDARD DIMENSIONAL RATIO (SDR) 11, ASTM D1784: ASTM D2846, NSF CERTIFIED.
7. JOINTS: SOLVENT CEMENT, ASTM F493
8. FITTINGS: SAME AS TUBING. FITTINGS AND TUBING SHALL BE A SYSTEM PROVIDED BY THE SAME MANUFACTURER. THREADED ADAPTERS FOR THREADED VALVES SHALL BE METAL THREADED ADAPTER WITH SOLVENT SOCKET.
9. LIMITATIONS: SHALL NOT BE USED IN A RETURN AIR PLENUM UNLESS SPECIFICALLY LISTED TO ASTM E84/UL723.
10. SPECIAL REQUIREMENTS: PROVIDE EXPANSION LOOP(S) AND/OR EXPANSION JOINTS IN THE PIPING SYSTEM PER THE MANUFACTURER'S GUIDELINES AND AS SHOWN ON THE DRAWINGS. REFER TO SECTION 220516 FOR EXPANSION JOINT REQUIREMENTS.
PVC-DWV OR ABS-DWV; SCHEDULE 40; SOLVENT WELD JOINTS:
1. PIPE: SCHEDULE 40 RIGID, PVC-DWV, OR ABS-DWV, NORMAL IMPACT TYPE I, WITH PLAIN ENDS, CONFORMING TO ASTM STANDARDS D2665 OR D2661. CELLULAR CORE PIPING IS NOT ACCEPTABLE.
2. DESIGN PRESSURE/TEMPERATURE: GRAVITY AT 140°F (60°C).
3. JOINTS: SOLVENT-WELD SOCKET TYPE WITH SOLVENT RECOMMENDED BY PIPE MANUFACTURER.
4. FITTINGS: PVC-DWV, OR ABS-DWV. NORMAL IMPACT TYPE I, WITH SOLVENT WELD SOCKET TYPE ENDS FOR SCHEDULE 40 PIPE.
5. LIMITS: SCHEDULE 40 PVC-DWV, OR ABS-DWV PIPE MUST NOT BE THREADED. DO NOT USE WHERE EXPOSED OR IN RETURN AIR PLENUMS.
6. USE: USE PVC OR ABS ONLY WHERE ALLOWED BY LOCAL JURISDICTION. COMPLY WITH ALL SPECIAL REQUIREMENTS OR LIMITATIONS.
7. SPECIAL REQUIREMENTS: PROVIDE EXPANSION LOOP(S) AND/OR EXPANSION JOINTS IN THE PIPING SYSTEM PER THE MANUFACTURER'S GUIDELINES AND AS SHOWN ON THE DRAWINGS. REFER TO SECTION 220516 FOR EXPANSION JOINT REQUIREMENTS.

HOT AND COLD WATER - POTABLE AND NON-POTABLE
1. COPPER PIPE; TYPE L; SOLDER JOINTS: ALL SIZES
2. COPPER PIPE; TYPE L; MECHANICAL PRESS CONNECTION: 4" (100 MM) AND UNDER
3. CROSS-LINKED POLYETHYLENE (PEX); COLD EXPANSION JOINTS: 3" (70 MM) AND UNDER

DOMESTIC WATER BALL VALVES:
3" AND UNDER, 150 PSI SATURATED STEAM, 600 PSI CWP, FULL PORT, SCREWED OR SOLDER ENDS (ACCEPTABLE ONLY IF RATED FOR SOLDERING IN LINE WITH 470F MELTING POINT OF LEAD-FREE SOLDER), BRONZE BODY OF A COPPER ALLOY CONTAINING LESS THAN 15% ZINC, STAINLESS STEEL BALL AND TRIM, TEFLON SEATS AND SEALS, APOLLO #77C, 140, STOCKHAM #S_255-FB-P-UL BR1, R, MILWAUKEE #BA-400, WATTS, NIBCO #585-70-66, NATIONAL UTILITIES CO., RUB.
NOTES: PROVIDE EXTENDED SHAFT FOR ALL VALVES IN INSULATED PIPING. PROVIDE LOCK OUT TRIM FOR ALL VALVES OPENING TO ATMOSPHERE INSTALLED IN DOMESTIC WATER PIPING OVER 120F, HEATING WATER PIPING OVER 120F, STEAM, CONDENSATE, BOILER FEED WATER PIPING, COMPRESSED AIR PIPING AND GASOLINE/KEROSENE PIPING, AND AS INDICATED ON THE DRAWINGS. SOLID EXTENDED SHAFT IS NOT REQUIRED ON VALVES WITH LOCK OUT TRIM.

DOMESTIC WATER CHECK VALVES:
2" AND UNDER, 125# STEAM @ 406F, 200# CWP @ 150F, SCREWED, BRONZE, HORIZONTAL SWING. CRANE #37, HAMMOND #IB904, STOCKHAM #B319-Y, WALWORTH #3406, MILWAUKEE #509, WATTS #G-5000, NIBCO T-413B.

2-1/2" THRU 12", 200# CWP, DOUBLE DISC WAFER TYPE, BRONZE OR IRON BODY, BRONZE TRIM, METAL-TO-METAL OR VITON SEAT, 316 SS SHAFT, INCONEL 600 SPRING. MISSION DUO CHEK #12HPP (WITH INCONEL SPRINGS), MUELLER STEAM SPECIALTY CO. #71-AHB-K-W, STOCKHAM #WG-961-EPDM OR #WG-970-BUNA, NIBCO W-920-W.

22 10 00 PLUMBING PIPING (CONT.)

SANITARY WASTE AND VENT DRAINAGE (ABOVE GROUND)
1. CAST IRON; STANDARD WEIGHT; NO-HUB SLEEVE GASKETS: 1-1/2" (35 MM) TO 15" (375 MM)
2. PVC-DWV OR ABS-DWV; SCHEDULE 40; SOLVENT WELD JOINTS: ALL SIZES

CONDENSATE DRAINAGE (ABOVE GROUND)
DESIGN PRESSURE: GRAVITY
MAXIMUM DESIGN TEMPERATURE: 180F.

PIPING _ ALL SIZES:
1. PIPE AND FITTINGS: STANDARD WEIGHT CAST IRON SOIL PIPE, CORROSION PROTECTIVE COATING INSIDE AND OUTSIDE, ASTM A74, NSF CERTIFIED, CISPI TRADEMARK
2. JOINTS: HEAVY DUTY, NEOPRENE SLEEVE GASKET, ASTM C-564, 300 SERIES STAINLESS STEEL SHIELD, CLAMP, AND SCREWS WITH AT LEAST FOUR SCREW TYPE CLAMPS, FM 1680 OR ASTM C1540 -OR- LEAD AND OAKUM, ASTM B29.
3. ADAPTERS: TRANSITIONS FROM CAST IRON SOIL PIPE TO OTHER PIPE MATERIALS WITH MANUFACTURED ADAPTERS. HEAVY DUTY NEOPRENE SLEEVE GASKET, ASTM C-564, 300 SERIES STAINLESS STEEL SHIELD, CLAMP, AND SCREWS WITH NOT LESS THAN FOUR SCREW TYPE CLAMPS, FM 1680 OR ASTM C1540.

PIPING _ 1_1/4" THROUGH 4":
1. PIPE: TYPE M HARD TEMPER SEAMLESS COPPER DRAINAGE TUBE, ASTM B306.
2. JOINTS: SOLDER WITH 100% LEAD-FREE SOLDER AND FLUX, ASTM B32.
3. FITTINGS: CAST BRASS SOLDER JOINT DRAINAGE TYPE, ANSI B16.23 OR WROUGHT COPPER SOLDER JOINT DRAINAGE TYPE, ANSI B16.29.

UNIONS
COPPER PIPE _ WROUGHT COPPER FITTING _ GROUND JOINT.
BLACK STEEL (SCHEDULE 40) PIPE _ MALLEABLE IRON, GROUND JOINT, 150 PSI, BRONZE TO BRONZE SEAT.
GALVANIZED STEEL PIPE _ GALVANIZED MALLEABLE IRON, GROUND JOINT, 150 PSI, BRONZE TO BRONZE SEAT.

AT END OF MAIN AND OTHER POINTS WHERE LARGE VOLUME OF AIR MAY BE TRAPPED, USE 1/4"GLOBE VALVE, ANGLE TYPE, 125 PSI, CRANE #89, ATTACHED TO COUPLING IN TOP OF MAIN, 1/4" DISCHARGE PIPE TURNED DOWN WITH CAP.

RELIEF VALVES
(DOMESTIC HOT WATER) PRESSURE AND TEMPERATURE RELIEF, CAST BRONZE BODY AND INTERNAL PARTS, STAINLESS STEEL SPRING, TEST LEVER, THREADED INLET AND OUTLET. MAXIMUM SETTING OF 150 PSI AND 210F TEMPERATURE. CAPACITIES ASME CERTIFIED AND LABELED. ACCEPTABLE MANUFACTURERS: CASH SERIES FV, WATTS #40, #120, #N240, #340.

DRAIN VALVES
DRAIN VALVES SHALL BE SHUTOFF VALVES AS SPECIFIED FOR THE INTENDED SERVICE WITH ADDED 3/4" MALE HOSE THREAD OUTLET AND CAP.

CONNECTIONS BETWEEN DISSIMILAR METALS
CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE INSULATING DIELECTRIC TYPES THAT PROVIDE A WATER GAP BETWEEN THE CONNECTED METALS, AND THAT EITHER ALLOW NO METAL PATH FOR ELECTRON TRANSFER OR THAT PROVIDE A WIDE WATER GAP LINED WITH A NON-CONDUCTIVE MATERIAL TO IMPEDE ELECTRON TRANSFER THROUGH THE WATER PATH.

JOINTS SHALL BE RATED FOR THE TEMPERATURE, PRESSURE, AND OTHER CHARACTERISTICS OF THE SERVICE IN WHICH THEY ARE USED, INCLUDING TESTING PROCEDURE.

ALUMINUM, IRON, STEEL, BRASS, COPPER, BRONZE, AND STAINLESS STEEL ARE COMMONLY USED AND REQUIRE ISOLATION FROM EACH OTHER WITH THE FOLLOWING EXCEPTIONS:
1. IRON, STEEL, AND STAINLESS STEEL CONNECTED TO EACH OTHER.
2. BRASS, COPPER, AND BRONZE CONNECTED TO EACH OTHER.
3. BRASS OR BRONZE VALVES AND SPECIALTIES CONNECTED TO STEEL, IRON, OR STAINLESS STEEL IN CLOSED SYSTEMS. WHERE TWO OR MORE BRASS OR BRONZE ITEMS OCCUR TOGETHER, THEY SHALL BE CONNECTED WITH BRASS NIPPLES. DIELECTRIC PROTECTION IS REQUIRED AT CONNECTIONS TO EQUIPMENT OF A MATERIAL DIFFERENT THAN THE PIPING.

SCREWED JOINTS (ACCEPTABLE UP TO 2"SIZE):
1. DIELECTRIC WATERWAY RATED FOR 300 PSI CWP AND 225F.
2. ACCEPTABLE MANUFACTURERS: ELSTER GROUP CLEARFLOW FITTINGS, VICTAULIC SERIES 47, GRINNELL SERIES 407, MATCO-NORCA.

FLANGED JOINTS (ANY SIZE):
1. USE 1/8"MINIMUM THICKNESS, NON-CONDUCTIVE, FULL-FACE GASKETS.
2. EMPLOY ONE-PIECE MOLDED SLEEVE-WASHER COMBINATIONS TO BREAK THE ELECTRICAL PATH THROUGH THE BOLTS.
3. SLEEVE-WASHERS ARE REQUIRED ON ONE SIDE ONLY, WITH SLEEVES MINIMUM 1/32" THICK AND WASHERS MINIMUM 1/8" THICK.
4. INSTALL STEEL WASHERS ON BOTH SIDES OF FLANGES TO PREVENT DAMAGE TO THE SLEEVE_WASHER.
5. SEPARATE SLEEVES AND WASHERS MAY BE USED ONLY IF THE SLEEVES ARE MANUFACTURED TO EXACT LENGTHS AND INSTALLED CAREFULLY SO THE SLEEVES MUST EXTEND PARTIALLY PAST EACH STEEL WASHER WHEN TIGHTENED.
6. ACCEPTABLE MANUFACTURERS: EPCO, CENTRAL PLASTICS, PIPELINE SEAL AND INSULATOR, F. H. MALONEY, OR CALPICO.

VALVE CONNECTIONS
PROVIDE ALL CONNECTIONS TO MATCH PIPE JOINTS. VALVES SHALL BE SAME SIZE AS PIPE UNLESS NOTED OTHERWISE.

INSTALLATION PREPARATION
INSTALL ALL PRODUCTS PER MANUFACTURER'S RECOMMENDATIONS. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN END FERROUS PIPE. REMOVE SCALE AND DIRT, ON INSIDE AND OUTSIDE, BEFORE ASSEMBLY. CONNECT TO EQUIPMENT WITH FLANGES OR UNIONS. USE ONLY PIPING MATERIALS RATED FOR THE MAXIMUM TEMPERATURE OF THE APPLICATION, E.G., DO NOT USE PVC FOR DISHWASHER DRAINAGE OR PIPING THAT RECEIVES BOILER BLOWDOWN.

TESTING PIPING
1. TEST PIPING AT 150% OF NORMAL OPERATING PRESSURE.
2. PIPING SHALL HOLD THIS PRESSURE FOR ONE HOUR WITH NO DROP IN PRESSURE.
3. TEST PIPING USING WATER, NITROGEN, OR AIR AS COMPATIBLE WITH THE FINAL SERVICE OF THE PIPE. DO NOT USE COMBUSTIBLE FLUIDS.
4. DRAIN AND CLEAN ALL PIPING AFTER TESTING IS COMPLETE.

CLEANING PIPING
BEFORE ASSEMBLING PIPE SYSTEMS, REMOVE ALL LOOSE DIRT, SCALE, OIL AND OTHER FOREIGN MATTER ON INTERNAL OR EXTERNAL SURFACES BY MEANS CONSISTENT WITH GOOD PIPING PRACTICE SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER'S REPRESENTATIVE. BLOW CHIPS AND BURRS FROM MACHINERY OR THREAD CUTTING OPERATION OUT OF PIPE BEFORE ASSEMBLY. WIPE CUTTING OIL FROM INTERNAL AND EXTERNAL SURFACES.

DURING FABRICATION AND ASSEMBLY, REMOVE SLAG AND WELD SPATTER FROM BOTH INTERNAL AND EXTERNAL JOINTS BY PEENING, CHIPPING AND WIRE BRUSHING.

PRIOR TO BLOWING OR FLUSHING ERECTED PIPING SYSTEMS, DISCONNECT ALL INSTRUMENTATION AND EQUIPMENT, OPEN WIDE ALL VALVES, AND BE CERTAIN ALL STRAINER SCREENS ARE IN PLACE.

ALL WATER PIPING:
1. FLUSH ALL PIPING USING FAUCETS, FLUSH VALVES, ETC. UNTIL THE FLOW IS CLEAN.
2. AFTER FLUSHING, THOROUGHLY CLEAN ALL INLET STRAINERS, AERATORS, AND OTHER SUCH DEVICES.
3. IF NECESSARY, REMOVE VALVES TO CLEAN OUT ALL FOREIGN MATERIAL.

GENERAL INSTALLATION REQUIREMENTS
PROVIDE DIELECTRIC CONNECTIONS BETWEEN DISSIMILAR METALS. ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT. INSTALL TO CONSERVE BUILDING SPACE. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR EQUIPMENT. SLOPE WATER PIPING AND ARRANGE TO DRAIN AT LOW POINTS.

INSTALL BELL AND SPIGOT PIPING WITH BELLS UPSTREAM.

WHERE PIPE SUPPORTS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDS. SEAL PIPES PASSING THROUGH EXTERIOR WALLS WITH A WALL SEAL PER SECTION 22 05 29. PROVIDE SCHEDULE 40 GALVANIZED SLEEVE AT LEAST 2 PIPE SIZES LARGER THAN THE PIPE.

22 10 00 PLUMBING PIPING (CONT.)

ALL VERTICAL PIPE DROPS TO SINKS OR OTHER EQUIPMENT INSTALLED BELOW THE CEILING SHALL BE ROUTED WITHIN A WALL CAVITY, UNLESS SPECIFICALLY NOTED OTHERWISE TO BE SURFACE MOUNTED. FOR RENOVATION PROJECTS, THIS CONTRACTOR IS RESPONSIBLE FOR OPENING AND PATCHING EXISTING WALLS FOR INSTALLATION OF PIPING. WALL PATCHING SHALL MATCH EXISTING CONDITION.

INSTALLATION REQUIREMENTS IN ELECTRICAL ROOMS:
1. DO NOT INSTALL PIPING OR OTHER EQUIPMENT ABOVE ELECTRICAL SWITCHBOARDS OR PANELBOARDS. THIS INCLUDES A DEDICATED SPACE EXTENDING 25 FEET FROM THE FLOOR TO THE STRUCTURAL CEILING WITH WIDTH AND DEPTH EQUAL TO THE EQUIPMENT.

VALVES/FITTINGS AND ACCESSORIES:
1. INSTALL SHUTOFF VALVES THAT PERMIT THE ISOLATION OF EQUIPMENT/FIXTURES IN EACH ROOM WITHOUT ISOLATING ANY OTHER ROOM OR PORTION OF THE BUILDING. INDIVIDUAL FIXTURE ANGLE STOPS DO NOT MEET THIS REQUIREMENT. EXCEPTION: BACK-TO-BACK ROOMS IN NO MORE THAN TWO ADJACENT ROOMS. [SPECIFIER: REQUIRED IN ILLINOIS, GOOD PRACTICE IN OTHER STATES.]
2. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
3. PROVIDE ACCESS DOORS FOR CONCEALED VALVES AND FITTINGS.
4. INSTALL VALVE STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
5. PROVIDE ONE PLUG VALVE WRENCH FOR EVERY TEN PLUG VALVES 2" AND SMALLER, MINIMUM OF ONE. PROVIDE EACH PLUG VALVE 2_1/2" AND LARGER WITH A WRENCH WITH SET SCREW.
6. INSTALL BALANCNG VALVES WITH STRAIGHT, UNOBSTRUCTED PIPE SECTION BOTH UPSTREAM AND DOWNSTREAM AS REQUIRED, PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
7. INSTALL CORRUGATED, STAINLESS STEEL TUBING SYSTEM ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. INCLUDE STRIKER PLATES TO PROTECT TUBING FROM PUNCTURE WHERE TUBING IS RESTRAINED AND CANNOT MOVE.

SANITARY AND STORM PIPING:
INSTALL ALL SANITARY PIPING INSIDE THE BUILDING WITH A SLOPE OF AT LEAST THE FOLLOWING:

PIPE SIZE	MINIMUM SLOPE
3" AND UNDER	-0.25" PER FOOT
4" AND OVER	-0.125" PER FOOT

PIPE ERECTION AND LAYING
CAREFULLY INSPECT ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES BEFORE INSTALLATION. ANY ITEMS THAT ARE UNSUITABLE, CRACKED OR OTHERWISE DEFECTIVE SHALL BE REMOVED FROM THE JOB IMMEDIATELY.

ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES SHALL HAVE FACTORY APPLIED MARKINGS, STAMPINGS, OR NAMEPLATES WITH SUFFICIENT DATA TO DETERMINE THEIR CONFORMANCE WITH SPECIFIED REQUIREMENTS.

EXERCISE CARE AT EVERY STAGE OF STORAGE, HANDLING, LAYING AND ERECTING TO PREVENT ENTRY OF FOREIGN MATTER INTO PIPING, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES. DO NOT INSTALL ANY ITEM THAT IS NOT CLEAN.

UNTIL SYSTEM IS FULLY OPERATIONAL, ALL OPENINGS IN PIPING AND EQUIPMENT SHALL BE KEPT CLOSED EXCEPT WHEN ACTUAL WORK IS BEING PERFORMED ON THAT ITEM OR SYSTEM. CLOSURES SHALL BE PLUGS, CAPS, BLIND FLANGES OR OTHER ITEMS SPECIFICALLY DESIGNED AND INTENDED FOR THIS PURPOSE.

RUN PIPES STRAIGHT AND TRUE, PARALLEL TO BUILDING LINES WITH MINIMUM USE OF OFFSETS AND COUPLINGS. PROVIDE ONLY OFFSETS REQUIRED TO PROVIDE NEEDED HEADROOM OR CLEARANCE AND TO PROVIDE NEEDED FLEXIBILITY IN PIPE LINES.

MAKE CHANGES IN DIRECTION OF PIPES ONLY WITH FITTINGS OR PIPE BENDS. CHANGES IN SIZE ONLY WITH FITTINGS. DO NOT USE MITER FITTINGS, FACE OR FLUSH BUSHINGS, OR STREET ELBOWS. ALL FITTINGS SHALL BE OF THE LONG RADIUS TYPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED.

PROVIDE FLANGES OR UNIONS AT ALL FINAL CONNECTIONS TO EQUIPMENT, TRAPS AND VALVES.

ARRANGE PIPING AND CONNECTIONS SO EQUIPMENT SERVED MAY BE TOTALLY REMOVED WITHOUT DISTURBING PIPING BEYOND FINAL CONNECTIONS AND ASSOCIATED SHUTOFF VALVES.

USE FULL AND DOUBLE LENGTHS OF PIPE WHEREVER POSSIBLE.

UNLESS OTHERWISE INDICATED, INSTALL ALL PIPING, INCLUDING SHUTOFF VALVES AND STRAINERS, TO COILS, PUMPS AND OTHER EQUIPMENT AT LINE SIZE WITH REDUCTION IN SIZE BEING MADE ONLY AT CONTROL VALVE OR EQUIPMENT.

CUT ALL PIPE TO EXACT MEASUREMENT AND INSTALL WITHOUT SPRINGING OR FORCING EXCEPT IN THE CASE OF EXPANSION LOOPS WHERE COLD SPRINGING IS INDICATED ON THE DRAWINGS.

BRANCH CONNECTIONS
FOR DOMESTIC WATER AND VENT SYSTEMS ONLY, MAKE BRANCH CONNECTIONS WITH STANDARD TEE OR CROSS FITTINGS OF THE TYPE REQUIRED FOR THE SERVICE.

REDUCERS ARE GENERALLY NOT SHOWN. WHERE PIPE SIZES CHANGE AT TEE, THE TEE SHALL BE THE SIZE OF THE LARGEST PIPE SHOWN CONNECTING TO IT.

DO NOT USE DOUBLE WYE OR DOUBLE COMBINATION WYE AND EIGHTH BEND DWV FITTINGS IN HORIZONTAL PIPING.

BRANCH CONNECTIONS FROM THE HEADERS AND MAINS MAY BE MECHANICALLY FORMED USING AN EXTRACTION DEVICE. THE BRANCH PIPING CONNECTION SHALL BE BRAZED CONNECTION FOR THE FOLLOWING SERVICES ONLY:
1. DOMESTIC WATER PIPING ABOVE GRADE.

FURTHER LIMIT USE OF MECHANICALLY FORMED FITTINGS AS FOLLOWS:
1. MUST HAVE AT LEAST SAME PRESSURE RATING AS THE MAIN.
2. MAIN MUST BE TYPE K OR L COPPER TUBING.
3. PERMANENT MARKING SHALL INDICATE INSERTION DEPTH AND ORIENTATION.
4. BRANCH PIPE SHALL CONFORM TO THE INNER CURVE OF THE PIPING MAIN.
5. MAIN MUST BE 1"

22 10 30 PLUMBING SPECIALTIES

SECTION INCLUDES
ROOF AND FLOOR DRAINS
CLEANOUTS
TRAPS
TRAP SEALS AND PRIMERS
WATER HAMMER ARRESTERS AND AIR CHAMBERS

QUALITY ASSURANCE
FOR EACH PRODUCT SPECIFIED, PROVIDE COMPONENTS BY SAME MANUFACTURER THROUGHOUT.

CLEANOUTS
PROVIDE CLEANOUTS AS SHOWN AND SPECIFIED ON THE DRAWINGS AS WELL AS REQUIRED BY CODE.

CLEANOUTS ON EXPOSED PIPES SHALL BE CAST IRON WITH HEAVY DUTY CAST BRASS PLUG WITH RAISED HEAD.

CLEANOUT SHALL BE SAME SIZE AS THE PIPE UP TO 6" AND 6" FOR LARGER PIPES.

TRAPS
PROVIDE ALL INDIVIDUAL CONNECTIONS TO THE SANITARY SYSTEM WITH P_TRAPS, EXCEPT WHERE SUCH DRAINS DISCHARGE DIRECTLY INTO A PROPERLY TRAPPED COLLECTION BASIN OR SUMP. UNLESS OTHERWISE SPECIFIED OR SHOWN, TRAPS SHALL BE:
1. CHROMIUM PLATED CAST BRASS WHEN USED WITH PLUMBING FIXTURES OR WHEN INSTALLED EXPOSED IN FINISHED SPACES.
2. INSULATED AT ACCESSIBLE LAVATORIES.
3. CAST IRON, DEEP-SEAL PATTERN WHERE CONCEALED ABOVE CEILING, BELOW GRADE OR IN UNFINISHED AREAS.
4. DEEP-SEAL PATTERN OF THE SAME MATERIAL AND/OR COATING WHERE DRAINAGE LINES ARE OF SPECIAL MATERIALS OR COATINGS SUCH AS POLYPROPYLENE, PVDF, CPVC, ETC.

ALL TRAPS SHALL HAVE ACCESSIBLE, REMOVABLE CLEANOUTS, EXCEPT WHERE INSTALLED ON FLOOR DRAINS WITH REMOVABLE STRAINERS.

EACH TRAP SHALL BE COMPLETELY FILLED WITH WATER AT THE END OF CONSTRUCTION BUT BEFORE BUILDING SPACE TURNOVER TO THE OWNER. ALL FLOOR DRAINS, FLOOR SINKS, TRENCH DRAINS, ETC. SHALL BE FILLED WITH WATER AND A 1/2" MINIMUM LAYER OF MINERAL OIL.

WATER HAMMER ARRESTERS AND AIR CHAMBERS
PROVIDE WATER HAMMER ARRESTERS AS SHOWN AND SPECIFIED ON THE DRAWINGS AS WELL AS REQUIRED BY CODE.

ANSI A112.26.1; SIZED AND LOCATED IN ACCORDANCE WITH PDI WH_201, PRECHARGED FOR OPERATION BETWEEN -100F AND 300F AND MAXIMUM 250 PSIG WORKING PRESSURE.

AIR CHAMBERS SHALL MEET THE REQUIREMENTS OF THE APPLICABLE PLUMBING CODE. MINIMUM 12" LONG AT FIXTURES AND MINIMUM 24" LONG ON RISERS. AIR CHAMBERS SHALL BE THE SAME SIZE OR LARGER THAN THE PIPING IT IS CONNECTED TO.

INSTALLATION AND APPLICATION
COORDINATE CONSTRUCTION TO RECEIVE DRAINS AT REQUIRED INVERT ELEVATIONS.

INSTALL ALL ITEMS PER MANUFACTURER'S INSTRUCTIONS.

WATER HAMMER ARRESTERS AND AIR CHAMBERS:
INSTALL WATER HAMMER ARRESTERS IN ACCESSIBLE LOCATIONS. PROVIDE ACCESS DOORS AS REQUIRED. COORDINATE TYPE WITH ARCHITECT/ENGINEER/OWNER.

WATER HAMMER ARRESTORS SHALL BE INSTALLED IN COLD AND HOT WATER LINES UPSTREAM OF ALL PLUMBING FIXTURES OR EQUIPMENT, WITH A QUICK ACTING VALVE OR MULTIPLE QUICK ACTING VALVES. QUICK ACTING VALVES SHALL BE DEFINED AS SOLENOID ACTUATED VALVES, MANUAL FLUSH VALVES, SENSOR ACTIVATED FAUCETS AND FLUSH VALVES, SQUEEZE HANDLE SPRAY FAUCETS, AND OTHER SIMILAR TYPE VALVES.

INSTALL MULTIPLE WATER HAMMER ARRESTORS IN TOILET GROUP BRANCH PIPING GREATER THAN 20 FEET IN DEVELOPED LENGTH FROM THE COLD AND HOT WATER MAINS.

INSTALL AIR CHAMBERS AT EACH FIXTURE NOT PROTECTED BY A WATER HAMMER ARRESTER.

CLEANOUTS:
PROVIDE CLEANOUTS WHERE SHOWN ON THE DRAWINGS AND AS REQUIRED BY CODE, BUT IN NO CASE FARTHER APART THAN 50 FEET IN PIPE LESS THAN 6" SIZE AND 100 FEET APART IN 6" AND LARGER PIPES INSIDE THE BUILDING.

PROVIDE CLEANOUTS AT BASES OF ALL SANITARY AND STORM RISERS AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY CODE.

EXTEND CLEANOUTS TO THE FLOOR WITH LONG SWEEP ELBOWS.

INSTALL A FULL SIZE, TWO-WAY CLEANOUT WITHIN 5 FEET OF THE FOUNDATION INSIDE OR OUTSIDE OF BUILDING.

EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE. LUBRICATE THREADED CLEANOUT PLUGS WITH GRAPHITE AND LINSEED OIL. ENSURE CLEARANCE AT CLEANOUTS FOR RODDING OF DRAINAGE SYSTEM.

WALL CLEANOUTS SHALL BE INSTALLED ABOVE THE FLOW LINE OF THE PIPE THEY SERVE, BUT NO LESS THAN 12" ABOVE THE FINISHED FLOOR.

FLOOR DRAINS:
DRAINS IN UPPER FLOORS SHALL HAVE A FLASHING OF EPDM OR SIMILAR MEMBRANE SHEET. THE SHEET SHALL BE AT LEAST 36" X 36" SQUARE WITH THE DRAIN IN THE CENTER. CLAMP MEMBRANE IN AUXILIARY CLAMPING RING OF FLOOR DRAIN. MEMBRANE IS NOT REQUIRED IF UPPER FLOOR CONSTRUCTION IS SINGLE POUR, CAST-IN-PLACE CONCRETE.

USE ALTERNATE SEALING METHOD WHEN INSTALLING DRAINS IN EXISTING FLOOR SLABS.

COORDINATE SLOPING REQUIREMENTS WITH THE ARCHITECTURAL PLANS AND SPECIFICATIONS.

END OF SECTION

22/23 07 19 PLUMBING AND HVAC PIPING INSULATION

SECTION INCLUDES
PIPING INSULATION
INSULATION JACKETS

QUALITY ASSURANCE
MATERIALS: FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 IN ACCORDANCE WITH ASTM E84, NFPA 255, OR UL 723 (WHERE REQUIRED).

INSULATION MATERIALS
TYPE A: GLASS FIBER; ANSI/ASTM C547; 0.24 MAXIMUM "K" VALUE AT 75F; NON-COMBUSTIBLE. ALL PURPOSE, WHITE KRAFT JACKET BONDED TO ALUMINUM FOIL AND REINFORCED WITH FIBERGLASS YARN, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723).

TYPE B: ELASTOMERIC CELLULAR FOAM; ANSI/ASTM C534; FLEXIBLE PLASTIC; 0.27 MAXIMUM "K" VALUE AT 75F, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723). MAXIMUM 1" THICK PER LAYER WHERE MULTIPLE LAYERS ARE SPECIFIED.

VAPOR BARRIER JACKETS
KRAFT REINFORCED FOIL VAPOR BARRIER WITH SELF-SEALING ADHESIVE JOINTS. BEACH PUNCTURE RESISTANCE RATIO OF AT LEAST 50 UNITS. TENSILE STRENGTH: 35 PSI MINIMUM. SINGLE, SELF-SEAL ACRYLIC ADHESIVE ON LONGITUDINAL JACKET LAPS AND BUTT STRIPS.

REFRIGERANT PIPE COUPLING
INSULATION COUPLING: MOLDED THERMOPLASTIC ASTM D1525, -65F TO 275F, SIZES UP TO 4-1/8" O.D., AND RECEIVE INSULATION THICKNESS UP TO 1". SUITABLE FOR USE INDOORS OR OUTDOORS WITH UV STABILIZERS.

ACCEPTABLE MANUFACTURERS: KLO-SHURE OR EQUAL.

PREPARATION
INSTALL INSULATION AFTER PIPING HAS BEEN TESTED. PIPE SHALL BE CLEAN, DRY AND FREE OF RUST BEFORE APPLYING INSULATION.

GENERAL INSTALLATION REQUIREMENTS
INSTALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS, BUILDING CODES AND INDUSTRY STANDARDS.

CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PENETRATIONS. THIS APPLIES TO ALL INSULATED PIPING. MAINTAIN FIRE RATING OF ALL PENETRATIONS.

NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.

ON ALL INSULATED PIPING, PROVIDE AT EACH SUPPORT AN INSERT OF SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION, BETWEEN THE PIPE AND INSULATION JACKET, TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE INSERT SHALL BE SUITABLE FOR PLANNED TEMPERATURES, BE SUITABLE FOR USE WITH SPECIFIC PIPE MATERIAL, AND SHALL BE A 180 CYLINDRICAL SEGMENT THE SAME LENGTH AS METAL SHIELDS. INSERTS SHALL BE A CELLULAR GLASS (FOR ALL TEMPERATURE RANGES) OR MOLDED HYDROUS CALCIUM SILICATE (FOR PIPE WITH OPERATING TEMPERATURES ABOVE 70F, WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 PSI. POLYISOCYANURATE INSULATION WITH A MINIMUM COMPRESSIVE STRENGTH OF 24 PSI IS ACCEPTABLE FOR PIPE SIZES 3" AND BELOW, MINIMUM 60 PSI FOR PIPE SIZES 4", AND OPERATE BELOW 300F. FACTORY FABRICATED INSERTS MAY BE USED. RECTANGULAR BLOCKS, PLUGS, OR WOOD MATERIAL ARE NOT ACCEPTABLE. TEMPORARY WOOD BLOCKING MAY BE USED BY THE PIPING CONTRACTOR FOR PROPER HEIGHT; HOWEVER, THESE MUST BE REMOVED AND REPLACED WITH PROPER INSERTS BY THE INSULATION CONTRACTOR.

INSTALL METAL SHIELDS BETWEEN ALL HANGERS OR SUPPORTS AND THE PIPE INSULATION. SHIELDS SHALL BE GALVANIZED SHEET METAL, HALF_ROUND WITH FLARED EDGES. ADHERE SHIELDS TO INSULATION. ON COLD PIPING, SEAL THE SHIELDS VAPOR-TIGHT TO THE INSULATION AS REQUIRED TO MAINTAIN THE VAPOR BARRIER, OR ADD SEPARATE VAPOR BARRIER JACKET.

SHIELDS SHALL BE AT LEAST THE FOLLOWING LENGTHS AND GAUGES:

PIPE SIZE:	SHIELD SIZE:
1/2" TO 3" PIPE	12" LONG X 18 GAUGE
4" PIPE	12" LONG X 16 GAUGE
5" TO 6" PIPES	8" LONG X 16 GAUGE
8" TO 14" PIPES	24" LONG X 14 GAUGE
16" TO 24" PIPES	24" LONG X 12 GAUGE

ALL PIPING AND INSULATION THAT DOES NOT MEET 25/50 THAT IS LOCATED IN AN AIR PLENUM SHALL HAVE WRITTEN APPROVAL FROM THE AUTHORITY HAVING JURISDICTION AND THE LOCAL FIRE DEPARTMENT FOR AUTHORIZATION AND MATERIALS APPROVAL. IF APPROVAL HAS BEEN ALLOWED, THE NON-RATED MATERIAL SHALL BE WRAPPED WITH A PRODUCT THAT HAS PASSED ASTM E84 AND/OR NFPA 255 TESTING WITH A RATING OF 25/50 OR BELOW.

INSULATED PIPING OPERATING BELOW 60F
INSULATE FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, FLEXIBLE HOSES, AND EXPANSION JOINTS. SEAL ALL PENETRATIONS OF VAPOR BARRIER.

ON PIPING OPERATING BELOW 60F IN LOCATIONS THAT ARE NOT MECHANICALLY COOLED (E.G., PENTHOUSES, MECHANICAL ROOMS, TUNNELS, CHASES AT EXTERIOR WALLS, ETC.), TYPE B INSULATION SHALL BE USED.

ALL BALANCE VALVES WITH FLUID OPERATING BELOW 60F SHALL BE INSULATED WITH A REMOVABLE PLUG WRAPPED WITH VAPOR BARRIER TAPE TO ALLOW READING AND ADJUSTING OF THE VALVE.

INSULATED PIPING OPERATING BETWEEN 60F AND 140F
DO NOT INSULATE FLANGES AND UNIONS, BUT BEVEL AND SEAL ENDS OF INSULATION AT SUCH LOCATIONS. INSULATE ALL FITTINGS, VALVES AND STRAINERS.

INSULATED PIPING OPERATING ABOVE 140F
INSULATE FITTINGS, VALVES, FLANGES, AND STRAINERS.

ALL BALANCE VALVES WITH FLUID OPERATING ABOVE 140F SHALL BE INSULATED AND AN OPENING SHALL BE LEFT IN THE INSULATION TO ALLOW FOR READING AND ADJUSTING THE VALVE.

REFRIGERANT PIPING
ON REFRIGERANT PIPING (25F AND ABOVE) AND NOT REQUIRED TO MEET THE 25/50 FLAME/SMOKE, PROVIDE AT EACH STRUT OR CLEVIS SUPPORT AN INSULATION COUPLING TO SUPPORT PIPE AND TO ACCEPT INSULATION THICKNESS OF ADJOINING INSULATION, TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE COUPLING SHALL BE SUITABLE FOR PLANNED TEMPERATURES, USE WITH SPECIFIED PIPE MATERIAL, AND SHALL BE A 360, ONE-PIECE CYLINDRICAL SEGMENT. USE MECHANICAL FASTENERS WHERE COUPLING CANNOT BE INSTALLED ON PIPE DURING INSTALLATION. CONTRACTOR SHALL APPLY ADHESIVE TO ENDS OF INSULATION ENTERING INSULATION COUPLING TO MAINTAIN VAPOR BARRIER.

22/23 07 19 PLUMBING AND HVAC PIPING INSULATION (CONT.)

EXPOSED PIPING
LOCATE AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.

WHERE EXPOSED INSULATED PIPING EXTENDS ABOVE THE FLOOR, PROVIDE A SHEET METAL GUARD AROUND THE INSULATION EXTENDING 12" ABOVE THE FLOOR. GUARD SHALL BE 0.016" CYLINDRICAL SMOOTH OR STUCCO ALUMINUM AND SHALL FIT TIGHTLY TO THE INSULATION.

INSULATION INSTALLATION
TYPE A INSULATION:
1. ALL SERVICE JACKETS: SEAL ALL LONGITUDINAL JOINTS WITH SELF_SEAL LAPS USING A SINGLE PRESSURE SENSITIVE ADHESIVE SYSTEM. DO NOT STAPLE.
2. INSULATION WITHOUT SELF-SEAL LAP MAY BE USED IF INSTALLED WITH BENJAMIN FOSTER 85_20 OR EQUIVALENT CHICAGO MASTIC, 3M OR CHILDERS LAP ADHESIVE.
3. APPLY INSULATION WITH LAPS ON TOP OF PIPE.
4. FITTINGS, VALVE BODIES AND FLANGES: FOR 4" AND SMALLER PIPES, INSULATE WITH 1 LB.DENSITY INSULATION WRAPPED UNDER COMPRESSION TO A THICKNESS EQUAL TO THE ADJACENT PIPE INSULATION. FOR PIPES OVER 4", USE MITERED SEGMENTS OF PIPE INSULATION. FINISH WITH PREFORMED PLASTIC FITTING COVERS. SECURE FITTING COVERS WITH PRESSURE SENSITIVE TAPE AT EACH END. OVERLAP TAPE AT LEAST 2" ON ITSELF. FOR PIPES OPERATING BELOW 60F, SEAL FITTING COVERS WITH VAPOR RETARDER MASTIC IN ADDITION TO TAPE.

TYPE B INSULATION:
1. ELASTOMERIC CELLULAR FOAM: WHERE POSSIBLE, SLIP INSULATION OVER THE OPEN END OF PIPE WITHOUT SLITTING. SEAL ALL BUTT ENDS, LONGITUDINAL SEAMS, AND FITTINGS WITH ADHESIVE. AT ELBOWS AND TEES, USE MITERED CONNECTIONS. DO NOT COMPRESS OR CRUSH INSULATION AT CEMENTED JOINTS. JOINTS SHALL BE SEALED COMPLETELY AND NOT PUCKER OR WRINKLE. PAINT THE OUTSIDE OF OUTDOOR INSULATION WITH TWO COATS OF LATEX ENAMEL PAINT RECOMMENDED BY THE MANUFACTURER.
2. SELF-SEAL INSULATION MAY BE USED ON PIPES OPERATING BELOW 170F.

PLASTIC COVERING:
1. PROVIDE VAPOR BARRIER AS SPECIFIED FOR INSULATION TYPE. COVER WITH PLASTIC JACKET COVERING. POSITION SEAMS TO SHED WATER.
2. SOLVENT WELD ALL JOINTS WITH MANUFACTURER RECOMMENDED CEMENT.
3. OVERLAP ALL LAPS AND BUTT JOINTS 1-1/2" MINIMUM. REPAIR ANY LOOSE ENDS THAT DO NOT SEAL SECURELY. SOLVENT WELD ALL FITTING COVERS IN THE SAME MANNER. FINAL INSTALLATION SHALL BE WATERTIGHT.
4. ALL JOINTS IN AREAS NOTED SHALL MEET USDA STANDARDS FOR TOTALLY SEALED SYSTEMS, INCLUDING OVERLAPS OF 1" ON CIRCUMFERENTIAL AND 1.5" TO 2" ON LONGITUDINAL SEAMS.
5. USE PLASTIC INSULATION COVERING ON ALL EXPOSED PIPES INCLUDING, BUT NOT LIMITED TO:
A. ALL PIPING IN MECHANICAL ROOMS AND/OR TUNNELS THAT IS SUBJECT TO DAMAGE FROM NORMAL OPERATIONS. (EXAMPLE: PIPING THAT MUST BE STEPPED OVER ROUTINELY.)
6. ELASTOMERIC PIPING INSULATION MAY HAVE TWO COATS OF LATEX PAINT INSTEAD OF PLASTIC JACKET.
7. USE COLORED PLASTIC COVERING ON THE FOLLOWING PIPES:
a. ALL EXTERIOR PIPING.

END OF SECTION

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Horizon-Architecture

IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	PARPOL

SHEET TITLE
PLUMBING SPECIFICATIONS

SCALE
Scale:

SHEET NUMBER
P502

9405.00 DOC CBC 2 AMPB BUILDING RENOVATION
IT ROOM RENOVATION

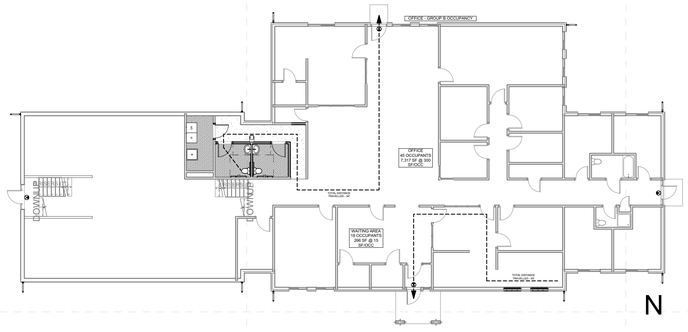
LIFE SAFETY LEGEND

EXIT TRAVEL PATH AND DISTANCE (250' MAX) — TOTAL DISTANCE TRAVELED - XXX'

EGRESS COMPONENT CAPACITY — XX" STAIR, EGRESS CAPACITY - XX, OCCUPANT LOAD - X

FIRE EXTINGUISHER CABINET — FEC

EXIT SIGN



4 LIFE SAFTEY PLAN
SCALE: 1/16" = 1'-0"

0 8' 16' 32'

BUILDING CODE SUMMARY

APPLICABLE CODES AND ORDINANCES
2015 IBC: ALL APPLICABLE CHAPTERS
ANSI 117.1, 2009 EDITION: ALL APPLICABLE CHAPTERS

PROJECT SCOPE:
OFFICE BUILDING INFORMATION TECHNOLOGY ROOM RENOVATION

BUILDING AND PROJECT DATA

BUILDING DESCRIPTION AND USE	2 STORY BLDG.	COMMERCIAL, RENOVATION

	IBC 2015	REQUIRED/ALLOWED	PROVIDED
USE AND OCCUPANCY	CHAPTER 3		B
CONSTRUCTION TYPE	SECTION 602 AND TABLE 601		VB
AUTOMATIC SPRINKLER SYSTEM	SECTION 903	NO	NO
BUILDING HEIGHT	TABLE 504.3	40' MAX.	APPX. 13'
BUILDING STORIES	TABLE 504.4	2	2
LARGEST FLOOR AREA / STORY/1ST FLOOR AREA	TABLE 506.2	9,000 SQ. FT.	4,674 SQ. FT.

OCCUPANCY CALCS	AREA	REQUIRED	OCCUPANT LOAD
OFFICE AREA	4,408 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	45
WAITING AREA	266 SQ. FT. (GROSS)	15 SQ. FT. / PERSON (GROSS)	18
LOWER OFFICE AREA	1,493 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	15
UPPER OFFICE AREA	1,416 SQ. FT. (GROSS)	100 SQ. FT. / PERSON (GROSS)	15
ALL OCCUPANCIES	**7,583 SQ. FT. (GROSS)**		**93**

FIRE RESISTANCE RATINGS	IBC 2015	REQUIRED	PROVIDED
PRIMARY STRUCTURAL FRAME	TABLE 601 AND SECTION 704	0 HOURS	1 HOURS MIN
BEARING WALLS			
EXTERIOR	TABLE 601, 602, 721 & SECTION 705	0 HOURS	0 HOURS MIN
INTERIOR	TABLE 601	0 HOURS	0 HOURS MIN
NONBEARING WALLS AND PARTITIONS			
EXTERIOR	TABLE 601, 602 & SECTION 705	0 HOURS	0 HOURS MIN
INTERIOR	TABLE 601	0 HOURS	0 HOURS MIN
FLOOR CONSTRUCTION	TABLE 601	0 HOURS	0 HOURS MIN
ROOF CONSTRUCTION	TABLE 601	0 HOURS	0 HOURS MIN
EXTERIOR WALL OPENINGS			
UNPROTECTED	TABLE 705.8.3	NOT REQUIRED	NOT REQUIRED
PROTECTED	TABLE 705.8.2	NOT REQUIRED	NOT REQUIRED

MEANS OF EGRESS	IBC 2015	REQUIRED	PROVIDED
MAXIMUM PATH OF COMMON EGRESS TRAVEL	SECTION 1006.2.1	75'	35'
MAXIMUM EXIT ACCESS TRAVEL DISTANCE	SECTION 1017 & TABLE 1017.2	200'	85' MAX
MINIMUM CORRIDOR WIDTH	SECTION 1020	44"	55"
MAXIMUM DEAD END	SECTION 1020	20'	21'
MINIMUM NUMBER OF EXITS	SECTION 1006 & TABLE 1006.3.2	2	4

SHEET INDEX

ABBREVIATIONS

A.D.	AREA DRAIN	DN	DOWN	HORIZ.	HORIZONTAL	PL. LAM	PLASTIC LAMINATE	U.L.	UNDERWRITERS LABORATORIES
ABV.	ABOVE	DWG.	DRAWING	HT	HEIGHT	QTY.	QUANTITY	VEST.	VESTIBULE
ADA	ACCESSIBLE / AMERICANS WITH DISABILITIES ACT	DEPT.	DEPARTMENT	INSUL.	INSULATION / INSULATING	R	RISER	V.C.T.	VINYL COMPOSITION TILE
		DBL.	DOUBLE	I.D.	INSIDE DIAMETER	R.W.C.	RAIN WATER CONDUCTOR	W	WITH
ADJ.	ADJUSTABLE	DIM.	DIMENSION	INCAND.	INCANDESCENT	REINF.	REINFORCING / REINFORCED	W.C.	WATER CLOSET
A.G.R.	AREA OF REFUGE	DR.	DOOR	JAN.	JANITOR	REQ.	REQUIRED	WD	WOOD
ALUM.	ALUMINUM	EXIST.	EXISTING	JT.	JOINT	R.O.	ROUGH OPENING	&	AND
ALT.	ALTERNATE	EQ.	EQUAL	LBS.	POUNDS	REV.	REVISED / REVISION	@	AT
A.F.F.	ABOVE FINISHED FLOOR	E.C.	ELECTRICAL CONTRACTOR	LAV.	LAVATORY	REFL.	REFLECTED	±	PLUS OR MINUS
AC.	ACOUSTIC / ACOUSTICAL	EL.	ELEVATION	LAM.	LAMINATE	REC.	RECESSED	°	DEGREE
A.F.	ALUMINUM FACE	ELEV.	ELEVATOR	L.P.	LOW POINT	RAD.	RADIUS	∠	ANGLE
APPX.	APPROXIMATE / APPROXIMATELY	ELEC.	ELECTRIC / ELECTRICAL	MAX.	MAXIMUM	S.S.	STAINLESS STEEL	[	CHANNEL
		EXP.	EXPANSION	MFR.	MANUFACTURER / MANUFACTURED	ST.	STREET	#	NUMBER
BD.	BOARD	EXT.	EXTERIOR	MTL.	METAL	SIM.	SIMILAR	□	SQUARE
BLK.	BLOCK / BLOCKING	EA.	EACH	MIN.	MINIMUM	STL.	STEEL	Ø	ROUND / DIAMETER
BLDG.	BUILDING	F.D.	FLOOR DRAIN	MIRR.	MIRRORED	SQ.	SQUARE	℄ / C.L.	CENTER LINE
B.O.	BOTTOM OF	F.E.	FIRE EXTINGUISHER	MTD.	MOUNTED	SAN.	SANITARY	⏥ / PL.	PLATE
B.O.S.	BOTTOM OF STEEL	F.E.C.	FIRE EXTINGUISHER CABINET	M.O.	MASONRY OPENING	SUSP.	SUSPENDED	⊓	U-BAR
CAB.	CABINET			MISC.	MISCELLANEOUS	STD.	STANDARD	∟	LEG-BAR
C.C.	CENTER-TO-CENTER	FIN.	FINISH / FINISHED	MECH.	MECHANICAL	SPEC.	SPECIFICATION		
CLG.	CEILING	FLR.	FLOOR	N.I.C.	NOT IN CONTRACT	TEL.	TELEPHONE		
CLOS.	CLOSET	F.O.	FACE OF	NO.	NUMBER	T.O.	TOP OF		
C.M.	CONSTRUCTION MANAGER	FT.	FEET / FOOT	N.T.S.	NOT TO SCALE	T.O.S.	TOP OF STEEL		
CMU	CONCRETE MASONRY UNIT	FLUOR.	FLUORESCENT	O.C.	ON CENTER	T.O.W.	TOP OF WALL		
C.J.	CONTROL JOINT	GYP.	GYPSUM	O.D.	OUTSIDE DIAMETER	TOIL.	TOILET		
CONC.	CONCRETE	GALV.	GALVANIZED	OPP.	OPPOSITE	TYP.	TYPICAL		
CORR.	CORRIDOR	GA.	GAUGE	OPG.	OPENING	THK.	THICK		
COL.	COLUMN	G.C.	GENERAL CONTRACTOR	P.C.	PLUMBING CONTRACTOR	TMP.	TEMPERED		
CONT.	CONTINUE / CONTINUOUS	HR.	HOUR	P.F.	PANEL FACE	T.S.G.	TEMPERED SAFETY GLASS		
CONTR.	CONTRACTOR	H.P.	HIGH POINT	PR.	PAIR	U.O.N.	UNLESS OTHERWISE NOTED		
DIA.	DIAMETER	HVAC	HEAT, VENTILATION, AIR-CONDITIONING	P.T.	PRESSURE TREATED				
DTL.	DETAIL								

VERIFY SCALE
BAR IS ONE (1) INCH LONG ON ORIGINAL DRAWING
0 1
IF BAR IS NOT ONE (1) INCH LONG, ADJUST SCALE ACCORDINGLY

GRAPHIC SYMBOLS

WINDOW MARKER — W01

SKYLIGHT MARKER — S01

DOOR IDENTIFIERS
DOOR IDENTIFIER (ELEVATIONS/SECTIONS) — D01.1
6" TYPICAL, UNLESSOTHERWISE NOTED
DOOR IDENTIFIER (PLANS) — D01.1

SECTION / DETAIL MARKER
INDICATES SECTION LOCATION ON SHEET
XX / YY
INDICATES SHEET ON WHICH DRAWING IS SHOWN

INTERIOR ELEVATION MARKER
A1 / B2 / C3 / D4
INDICATES ELEVATION LOCATION ON SHEET
XX
INDICATES SHEET ON WHICH ELEVATION IS SHOWN

ELEVATION / SECTION MARKER
INDICATES ELEVATION LOCATION ON SHEET
XX / YY
INDICATES SHEET ON WHICH DRAWING IS SHOWN

DETAIL / ENLARGED PLAN MARKER
INDICATES DETAIL LOCATION ON SHEET
XX / YY
INDICATES SHEET ON WHICH DETAIL IS SHOWN

SPACE DESIGNATION
OFFICE
003
1/A-201
SPACE NAME
SPACE NUMBER
ENLARGED PLAN REFERENCE

WALL TYPE MARKER — 4C

KEYNOTE IDENTIFIER
1.01.01
KEYNOTE: SEE KEYNOTE LEGEND ON DRAWING'S LAYOUT
1.01.01
ALTERNATE KEYNOTE: SEE KEYNOTE LEGEND ON DRAWING'S LAYOUT

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9405.00 DOC CBC 2 AMPB BUILDING RENOVATION
111 SHERMAN AVENUE AMES IA 50010

MARK	DATE	DESCRIPTION

PROJECT NO: #Pln
DATE: 9/6/2024
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SHEET TITLE
COVER SHEET

C-101

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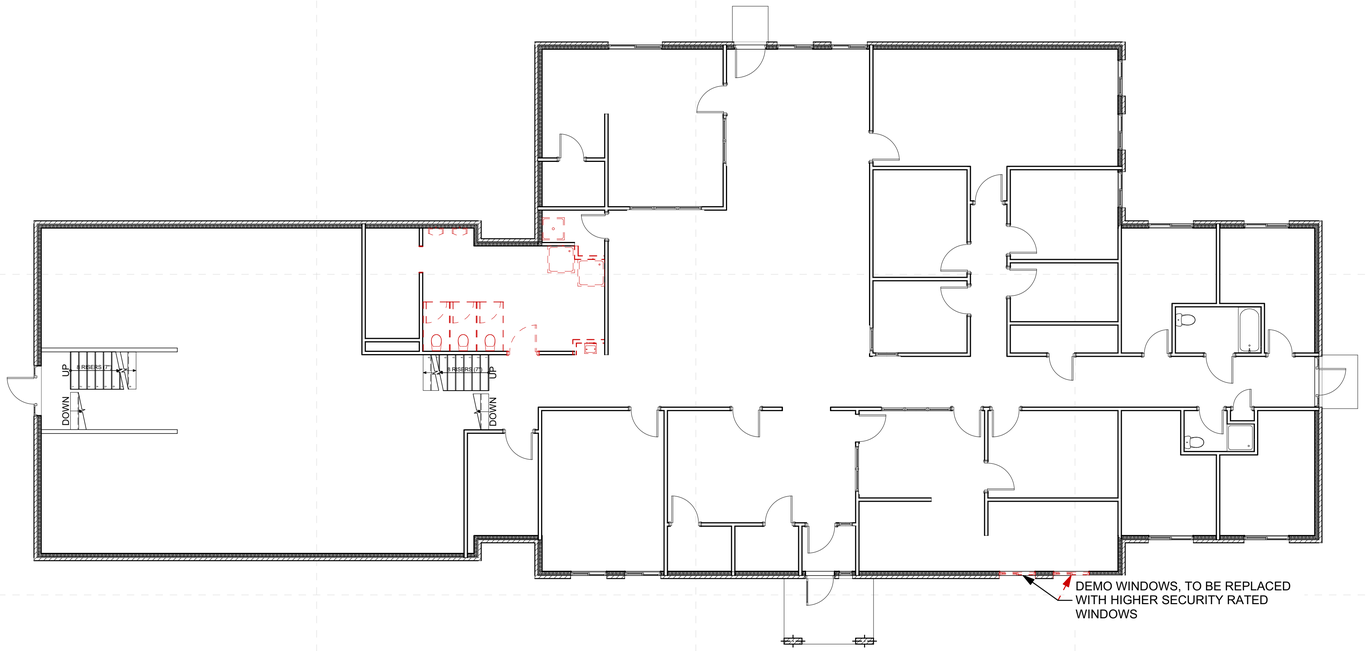

1 DEMOLTION PLAN - IT ROOM
SCALE: 1/8" = 1'-0"

0 4" 8" 16"

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9405.00 DOC CBC 2 AMPB BUILDING RENOVATION

111 SHERMAN AVENUE AMES IA 50010

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PROJECT NO: **#Pln**
DATE: **9/6/2024**
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DEMOLITION PLAN

A-101

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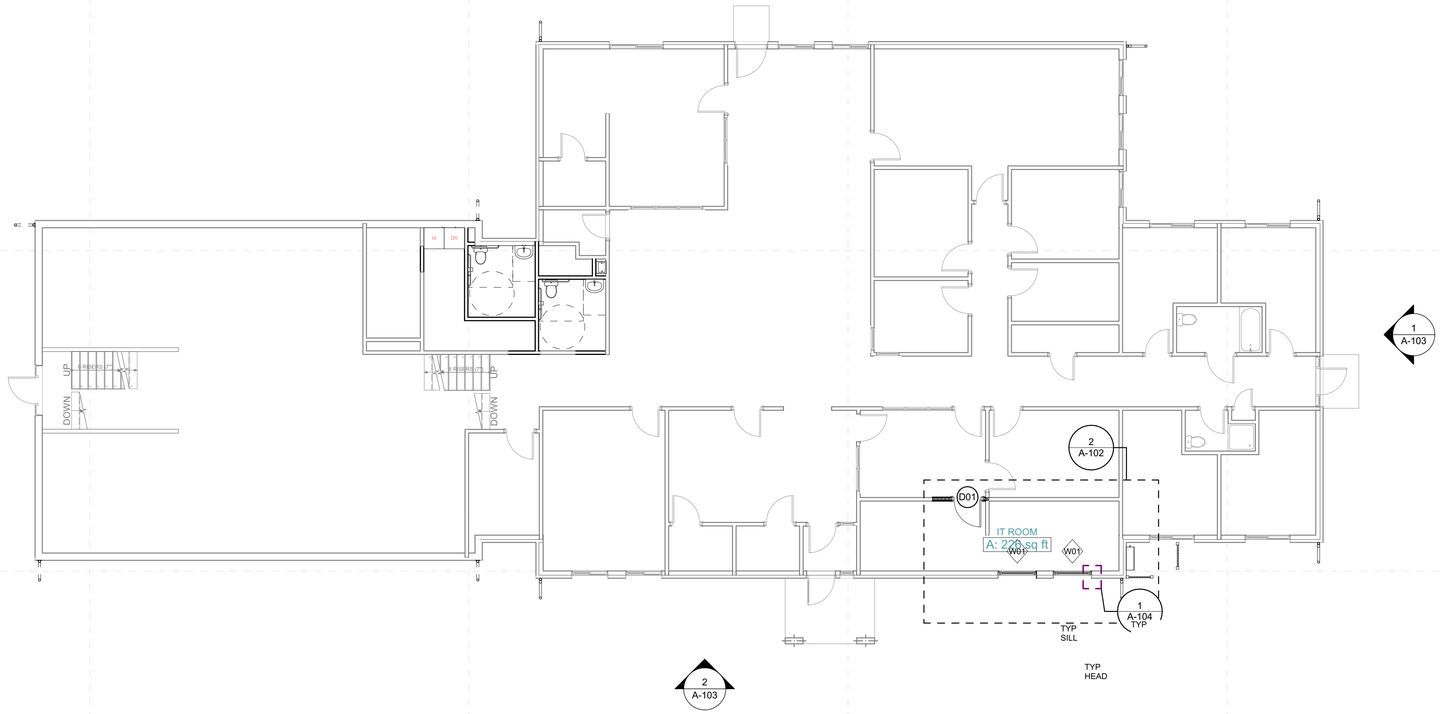
DOOR SCHEDULE				
ID	Quantity	DOOR		NOTES
		W	HT	
D01	1	3'	6'-8"	INTERIOR WOOD DOORS W/ STORAGE HW

WINDOW SCHEDULE				
ID	Quantity	SIZE		NOTES
		WIDTH	HEIGHT	
W01	2	4'	4'	FIXED LAMINATED SECURITY GL...



1 MAIN FLOOR - IT ROOM
SCALE: 1/8" = 1'-0"

NEW CONSTRUCTION GENERAL NOTES

1. ALL DIMENSIONS TO BE FIELD VERIFIED.

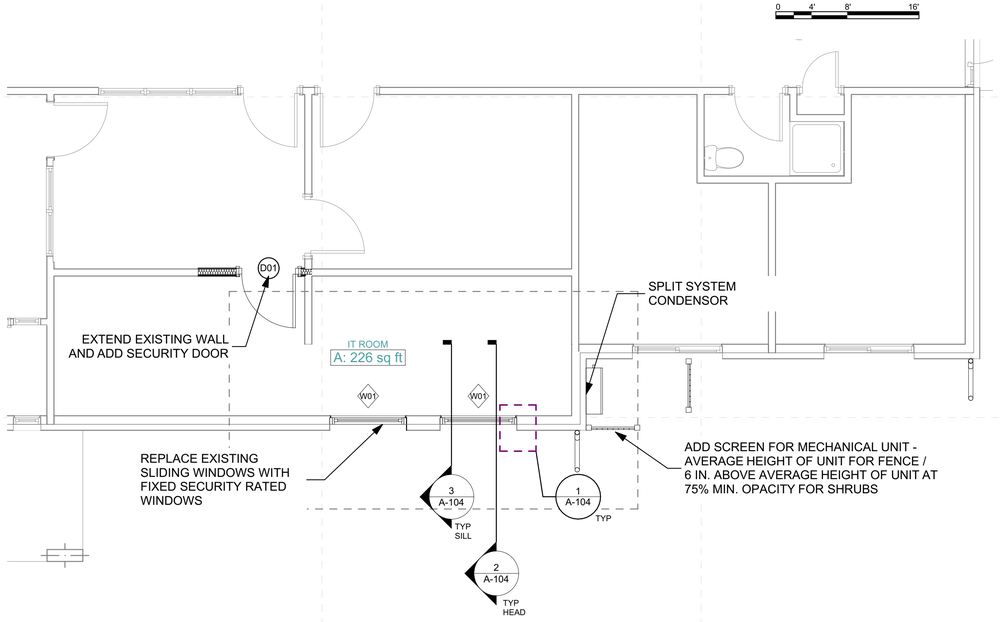
2. UNLESS OTHERWISE NOTED, ALL INTERIOR FINISHES TO REMAIN. PROTECT FINISHES AND FIXTURES.

3. PROVIDE MINOR PLUMBING MATERIALS AND MODIFICATION AS REQUIRED TO ACCOMMODATE REINSTALLATION OF FIXTURES FOLLOWING NEW FLOORING INSTALLATION.

4. REPAINT ALL NEW WALLS AND ADJACENT WALLS TO THE EXTENT REQUIRED TO MATCH FINISH (NEAREST CORNER OF EXISTING WALL UNLESS OTHERWISE NOTED).

5. PROTECT EXISTING FLOORING TO REMAIN. NEATLY TRIM AND RESECURE EDGES OF CARPET AT NEW PARTITION EXTENSION AND DOOR LOCATION.

6. ALL NEW PARTITIONS 2X4 STUDS @ 16" O.C. WITH 5/8" TYPE X GWB. ALL EXPOSED GYPSUM BOARD TO BE PAINTED. INSTALL VINYL WALL BASE AT NEW PARTITIONS TO MATCH EXISTING.



2 IT ROOM RENOVATION
SCALE: 1/4" = 1'-0"

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9405.00 DOC CBC 2 AMPB BUILDING RENOVATION

111 SHERMAN AVENUE AMES IA 50010

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DATE:	9/6/2024
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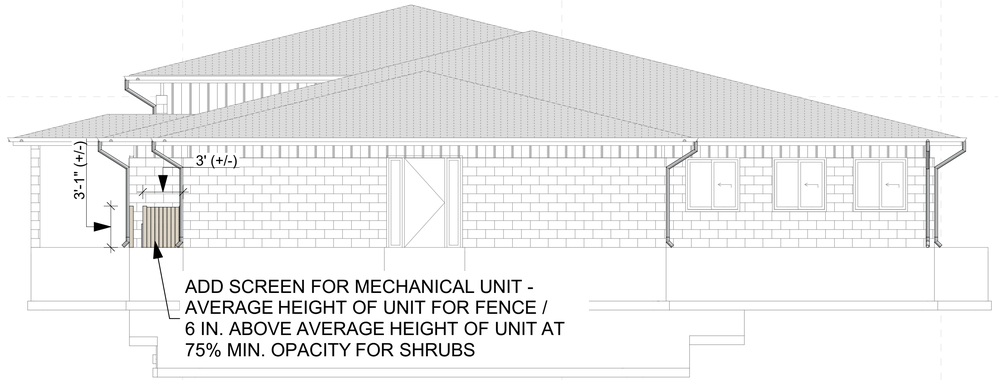
SHEET TITLE

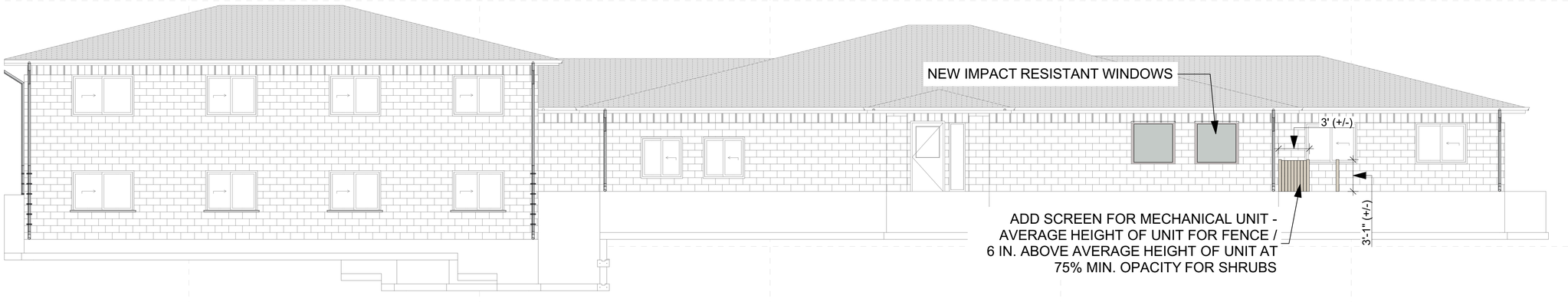
FLOOR PLANS

A-102



1 EAST ELEVATION - IT ROOM
SCALE: 3/16" = 1'-0"

0 4' 8' 12'



2 SOUTH ELEVATION - IT ROOM
SCALE: 3/16" = 1'-0"

0 4' 8' 12'

ISSUED FOR BIDDING - NOT FOR CONSTRUCTION

horizon. original. architecture.

9405.00 DOC CBC 2 AMPB BUILDING RENOVATION

111 SHERMAN AVENUE AMES IA 50010

MARK	DATE	DESCRIPTION

PROJECT NO:	#Pln
DATE:	9/6/2024
DRAWN BY:	MSN
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SHEET TITLE

EXTERIOR ELEVATIONS

A-103

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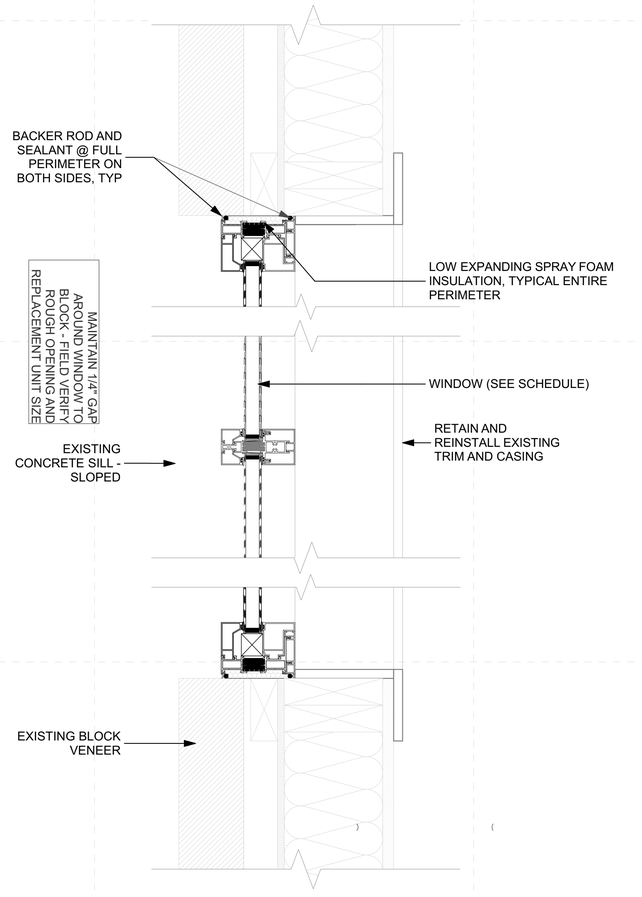
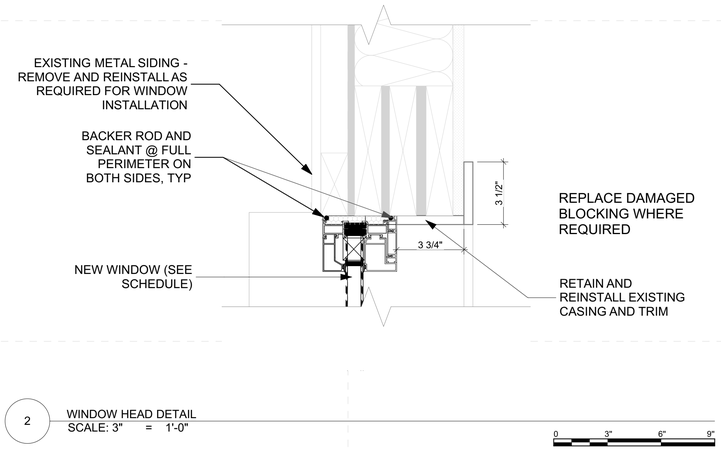
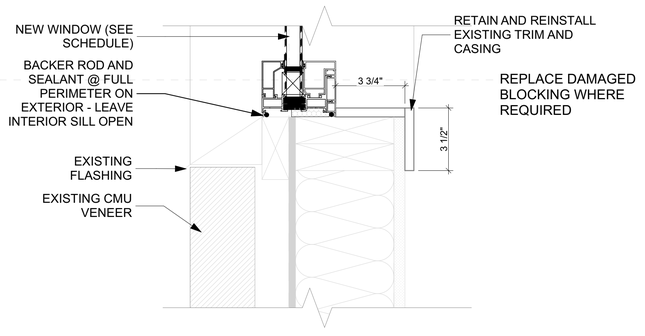


1 WINDOW JAMB DETAIL
SCALE: 3" = 1'-0"



2 WINDOW HEAD DETAIL
SCALE: 3" = 1'-0"



3 WINDOW SILL DETAIL
SCALE: 3" = 1'-0"

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9405.00 DOC CBC 2 AMPB BUILDING RENOVATION

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MARK	DATE	DESCRIPTION

PROJECT NO: #Pln
DATE: 9/6/2024
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SHEET TITLE

WINDOW INSTALLATION DETAILS

A-104

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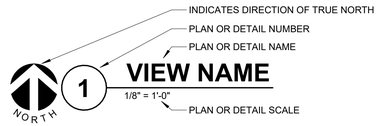
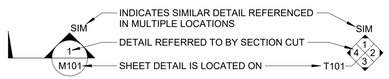
VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
- NEW
- EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
- NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
- EXISTING
- EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
- EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2015 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
V.C.	VENTILATION CONTRACTOR

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	PARKER POLASCHEK
MECHANICAL	GRADY DEGENEFFE
ELECTRICAL	ZACH ROSS

MECHANICAL DESIGN CONDITIONS:

DESIGN CONDITIONS: **BASED ON WEATHER DATA FOR: AMES, IA**

SUMMER: 95°F DRY BULB, 78°F WET BULB
WINTER: -15°F DRY BULB

TYPICAL ROOM SETPOINTS:

SUMMER DESIGN: 75°F DRY BULB, NO HUMIDITY REQUIREMENT
WINTER DESIGN: 70°F DRY BULB, NO HUMIDITY REQUIREMENT

REFER TO CONTROL DIAGRAMS FOR ROOM SPECIFICS.

VENTILATION SHEET INDEX

VENTILATION SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
	DUCT CAP
	DUCT DOWN
	DUCT UP
	SUPPLY/OUTSIDE AIR DUCT SECTION
	RETURN AIR DUCT SECTION
	EXHAUST/RELIEF AIR DUCT SECTION
SD-1 6/115	AIR TERMINAL PROPERTIES

VENTILATION ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
CFSD	CONTROL/FIRE/SMOKE DAMPER
DN	DOWN
DPG (0-2")	DIFFERENTIAL PRESSURE GAUGE (RANGE)
DPS	DIFFERENTIAL PRESSURE SWITCH
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FSD	FIRE/SMOKE DAMPER
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
SCCR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
TAB	TERMINAL AIR BOX
TD	TRANSFER DUCT
TYP	TYPICAL
UC-1	DOOR UNDERCUT BY OTHERS (1" TYPICAL)
UON	UNLESS OTHERWISE NOTED

MECHANICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS, AND STAFF. VERIFY EXISTING CONDITIONS AND REPORT ANY CONFLICTS BEFORE PROCEEDING.
2. NOT ALL EXISTING DUCTWORK AND PIPING IS SHOWN. VERIFY EXISTING CONDITIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF ANY CONFLICTS WITH NEW WORK.
3. FIELD VERIFY THE AVAILABLE CLEARANCES FOR DUCTWORK AND PIPING BEFORE FABRICATION. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. EACH CONTRACTOR SHALL FIELD VERIFY ACCESSIBILITY TO THE AREA OF THEIR WORK AND SHALL NOTIFY THE GENERAL CONTRACTOR, PRIOR TO BIDDING IF OTHER UTILITIES ARE REQUIRED TO BE REMOVED OR RELOCATED TO ALLOW ACCESS TO THEIR AREA OF WORK.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CUTTING, REMOVAL AND PATCHING OF ROOFS, WALLS, AND FLOORS ASSOCIATED WITH WORK BY ALL CONTRACTORS. CONTRACTORS SHALL NOTIFY THE GC OF AFFECTED AREAS PRIOR TO BIDDING.
6. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF CEILINGS, CEILING TILES, AND CEILING GRIDS ASSOCIATED WITH AREAS OF WORK BY ALL CONTRACTORS. NOTIFY THE GENERAL CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
7. WHERE EXISTING MECHANICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, PIPING, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING MECHANICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.
8. PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS THAT REMAIN ACTIVE.
9. OBTAIN PERMISSION FROM OWNER BEFORE SHUTTING DOWN ANY SYSTEM FOR ANY REASON. MAINTAIN SERVICE TO ALL COMPONENTS THAT ARE TO REMAIN UNTIL NEW SYSTEMS ARE INSTALLED.
10. MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR TIE IN AND SWITCHOVER. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MAKE CHANGEOVER TO NEW SYSTEMS WITH MINIMUM OUTAGE.
11. DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.
12. PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN REMOVED EQUIPMENT/ REFRIGERANT PIPING. RECLAIMED REFRIGERANT SHALL HAVE DOCUMENTATION AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).

VENTILATION GENERAL NOTES:

1. ALIGN TEMPERATURE SENSORS WITH LIGHT SWITCHES AND WHEN IN CLOSE PROXIMITY TO EACH OTHER.
2. PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, PLUMBING AND VENTILATION.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. CATALOG AND MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE, BUT ARE GIVEN AS AN AID TO THE CONTRACTOR AND TO INDICATE THE QUALITY REQUIRED. CONTRACTOR IS RESPONSIBLE FOR THE COMPLETE DESCRIPTION OF MATERIAL SCHEDULED ON THESE DRAWINGS AND IN THE SPECIFICATIONS BEFORE ORDERING. THE DESCRIPTION OF THE MATERIAL AND SCHEDULED PERFORMANCE TAKES PRECEDENCE OVER THE MODEL NUMBER. THE FIRST MANUFACTURER SCHEDULED IS THE BASIS OF DESIGN.
3. DETERMINATION OF QUANTITIES OF MATERIAL AND EQUIPMENT REQUIRED SHALL BE MADE BY THE CONTRACTOR FROM THE DOCUMENTS. WHERE MATERIAL AND/OR QUANTITY DISCREPANCIES ARISE BETWEEN DRAWINGS, SCHEDULES AND/OR SPECIFICATIONS, THE HIGHER QUALITY/ GREATER NUMBER SHALL GOVERN.
4. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
5. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
6. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
7. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
8. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
9. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
10. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
11. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
12. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
13. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
14. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
15. MAINTAIN A MINIMUM WORKING CLEARANCE OF 3'-6" IN FRONT OF ALL ELECTRICAL EQUIPMENT REQUIRING MAINTENANCE, INSPECTION, AND TESTING INCLUDING BUT NOT LIMITED TO PANELS, DISTRIBUTION PANELS, SWITCHBOARDS, MOTOR CONTROL CENTERS, TRANSFORMERS, EQUIPMENT DISCONNECTS AND STARTERS .
16. MAINTAIN THE DEDICATED ELECTRICAL EQUIPMENT SPACE DEFINED BY THE WIDTH / DEPTH OF ELECTRICAL EQUIPMENT MEASURED FROM THE FLOOR TO A HEIGHT 6 '-0" ABOVE THE EQUIPMENT OR THE STRUCTURAL CEILING, WHICHEVER IS LOWER. SYSTEMS FOREIGN TO THE ELECTRICAL DISTRIBUTION SYSTEM ARE NOT ALLOWED IN THE DEDICATED ELECTRICAL SPACE INCLUDING: DUCTWORK, PIPING, ETC.
17. PROVIDE CONCRETE EQUIPMENT PAD FOR ALL FLOOR MOUNTED EQUIPMENT. PAD SHALL EXTEND MINIMUM 6" BEYOND ALL SIDES OF EQUIPMENT EXCEPT WHERE PAD EXTENSION WOULD INTERFERE WITH WORKING SPACE AT EQUIPMENT CONTROL PANELS AND ELECTRICAL PANELS.

SCHEDULE GENERAL NOTES:

A. DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
MFR = MANUFACTURER

B. DISCONNECT TYPE:
NF = NON-FUSED

C. CONTROLLER STARTER TYPE:
FV = FULL VOLTAGE
VFD = VARIABLE FREQUENCY DRIVE

D. FAN RPM SHALL NOT EXCEED 110% OF SCHEDULED VALUE, WITH THE SCHEDULED WHEEL TYPE. SUBSTITUTION OF BI OR BIA FANS FOR FC IS ACCEPTABLE IF EFFICIENCY IS NOT LOWER.

E. NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

F. MUST BE WITHIN +/- 10% OF SCHEDULED RPM.

SPLIT SYSTEM UNIT SCHEDULE

NOTES:
1. UNIT SHALL BE PROVIDED WITH INTEGRAL LIFT/PUMP FOR CONDENSATE REMOVAL AND THE PUMP SHALL BE POWERED BY THE UNIT. IF NOT PROVIDED INTEGRAL WITH UNIT, CONTRACTOR SHALL PROVIDE SEPARATE CONDENS PUMP AND IS RESPONSIBLE FOR PROVIDING POWER FOR IT.
2. UNIT SHALL BE SELECTED WITH LOW AMBIENT PACKAGE.
3. ELECTRICAL VALUES IN SCHEDULE REPRESENT REQUIREMENTS FOR OUTDOOR UNITS. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT. EC TO PROVIDE POWER.

		INDOOR UNIT					OUTDOOR UNIT					ELECTRICAL									
	AREA		COOLING	MAX. DIMENSIONS				MAX. DIMENSIONS								DISCONNECT		CONTROLLER/ STARTER			
TAG NAME	SERVED	CFM	MBH	LENGTH	WIDTH	HEIGHT	SEER	HEIGHT	LENGTH	WIDTH	MODEL	VOLTAGE	PHASE	MCA	MOCP AMPS	BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	SCCR	MANUFACTURER	NOTES
SS-1	IT ROOM	370	18	33	7.5	12	14.97	1'-9 1/2"	2'-6"	9"	S4-W18	208	1	7.0	15	MFR	NF	MFR	5000	LENNOX	1,2

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111 N SHERMAN AVE, AMES IA 50010

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IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	PARPOL

SHEET TITLE
HVAC COVERSHEET

SCALE
Scale: As indicated

SHEET NUMBER
M000

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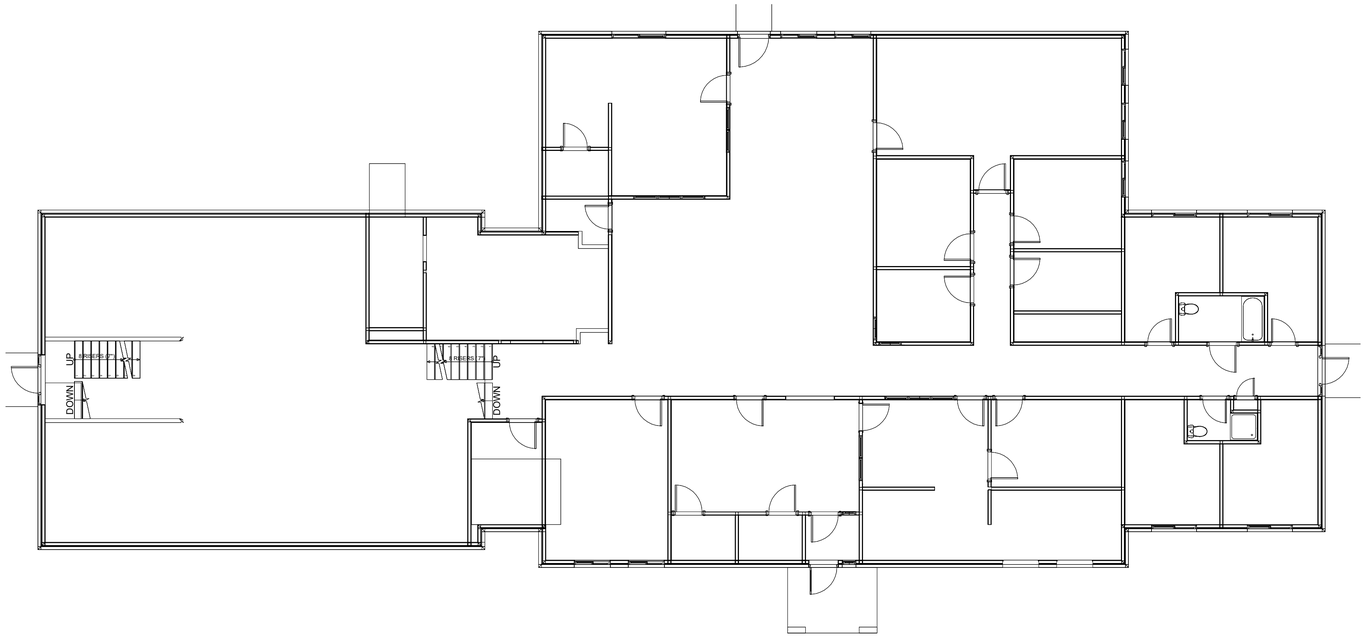
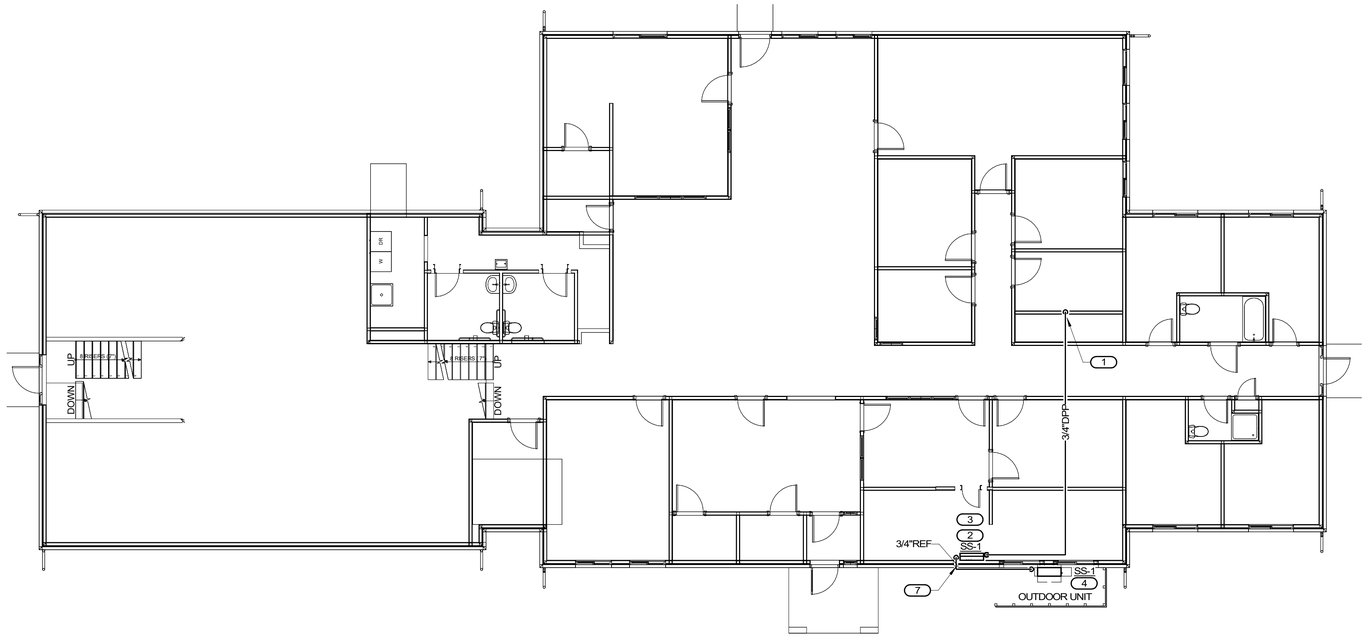


KEYNOTES:

1. ROUTE CONDENSATE DRAIN LINE TO NEAREST FLOOR DRAIN.
2. INSTALL INDOOR SPLIT SYSTEM UNIT AT 7' 0"
3. CONTRACTOR TO VERIFY FINAL LOCATION OF INDOOR SPLIT SYSTEM.
4. INSTALL OUTDOOR SPLIT SYSTEM UNIT ON GRADE.
5. NOT USED
6. NOT USED
7. SEAL WALL PENETRATION AIR AND WATER TIGHT.

NORTH 1 **LEVEL 01 DEMOLITION PLAN - HVAC**

1/8" = 1'-0"



NORTH 2 **LEVEL 01 PLAN - HVAC**

1/8" = 1'-0"

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The FUTURE. Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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Approved	PARPOL

SHEET TITLE

LEVEL 01 PLAN - HVAC

SCALE

Scale: 1/8" = 1'-0"

SHEET NUMBER

M201

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24003771.00 9/6/2024 12:00:04 PM IDAS/Ames/DOC CBC 2 AMPB

22 05 00 BASIC MECHANICAL REQUIREMENTS

SCOPE OF WORK
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE MECHANICAL WORK A FINISHED AND WORKING SYSTEM.

PLUMBING WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. FURNISH AND INSTALL ALL ITEMS LISTED IN THE PLUMBING MATERIAL LIST.
2. EXTEND EXISTING DOMESTIC WATER PIPING SYSTEM INCLUDING COLD, HOT, AND HOT WATER CIRCULATING PIPING WITHIN THE BUILDING. INSULATE ALL PIPING AS SPECIFIED.
3. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
4. REVISE AND/OR REPLACE WATER HEATERS.
5. EXTEND EXISTING SANITARY SEWER AND VENT SYSTEM.
6. FURNISH AND INSTALL SITE SANITARY SEWER PIPING, CLEANOUTS, AND MANHOLES.

HVAC WORK SHALL INCLUDE BUT IS NOT NECESSARILY LIMITED TO:
1. EXTEND EXISTING GAS PIPING SYSTEM INCLUDING ALL METER REQUIREMENTS.
2. FURNISH AND INSTALL REFRIGERANT PIPING, ACCESSORIES, AND FINAL CHARGE OF REFRIGERANT.
3. FURNISH AND INSTALL CONDENSATE DRAIN PIPING FROM COOLING RELATED EQUIPMENT SUCH AS AIR HANDLERS AND COOLING COIL DRAIN PANS.
4. FURNISH AND INSTALL COMPLETE EXHAUST DUCTWORK SYSTEMS INCLUDING ALL FITTINGS, INSULATION, INLETS, AND FANS.
5. FURNISH AND INSTALL GAS FLUES, STACKS, AND BREECHINGS.
6. FURNISH AND INSTALL ALL TEMPERATURE CONTROL SYSTEMS.

ALL WORK THAT WILL PRODUCE EXCESSIVE NOISE OR INTERFERENCE WITH NORMAL BUILDING OPERATIONS, AS DETERMINED BY THE OWNER/LANDLORD, SHALL BE SCHEDULED WITH THE OWNER/LANDLORD. IT MAY BE NECESSARY TO SCHEDULE SUCH WORK DURING UNOCCUPIED HOURS. THE OWNER/LANDLORD RESERVES THE RIGHT TO DETERMINE WHEN RESTRICTED CONSTRUCTION HOURS WILL BE REQUIRED. CONTRACTOR SHALL COORDINATE WITH THE LANDLORD DURING THE BIDDING PROCESS.

ALL CONTRACTORS SHALL ESTABLISH UTILITY ELEVATIONS PRIOR TO FABRICATION AND SHALL COORDINATE THEIR MATERIAL AND EQUIPMENT WITH OTHER TRADES.

THE MECHANICAL CONTRACTOR (FIRE PROTECTION/PLUMBING/HVAC/TEMPERATURE CONTROLS CONTRACTOR) SHALL:

BE RESPONSIBLE FOR ALL WIRING NOT SHOWN ON ELECTRICAL DRAWINGS BUT REQUIRED FOR MECHANICAL SYSTEMS.

VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE UNITS ARE TO BE MODIFIED, MOVED, OR REPLACED. CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING NEW UNITS OR REPLACEMENT UNITS.

QUALITY ASSURANCE
THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTING COMPLETE AND OPERATING SYSTEMS. THE CONTRACTOR ACKNOWLEDGES AND UNDERSTANDS THAT THE CONTRACT DOCUMENTS ARE A TWO-DIMENSIONAL REPRESENTATION OF A THREE-DIMENSIONAL OBJECT, SUBJECT TO HUMAN INTERPRETATION. THIS REPRESENTATION MAY INCLUDE IMPERFECT DATA, INTERPRETED CODES, UTILITY GUIDELINES, THREE-DIMENSIONAL CONFLICTS, AND REQUIRED FIELD COORDINATION ITEMS. SUCH DEFICIENCIES CAN BE CORRECTED WHEN IDENTIFIED PRIOR TO ORDERING MATERIAL AND STARTING INSTALLATION. THE CONTRACTOR AGREES TO CAREFULLY STUDY AND COMPARE THE INDIVIDUAL CONTRACT DOCUMENTS AND REPORT AT ONCE IN WRITING TO THE DESIGN TEAM ANY DEFICIENCIES THE CONTRACTOR MAY DISCOVER. THE CONTRACTOR FURTHER AGREES TO REQUIRE EACH SUBCONTRACTOR TO LIKEWISE STUDY THE DOCUMENTS AND REPORT AT ONCE ANY DEFICIENCIES DISCOVERED.

THE CONTRACTOR SHALL RESOLVE ALL REPORTED DEFICIENCIES WITH THE ARCHITECT/ENGINEER PRIOR TO AWARDING ANY SUBCONTRACTS, ORDERING MATERIAL, OR STARTING ANY WORK WITH THE CONTRACTOR'S OWN EMPLOYEES. ANY WORK PERFORMED PRIOR TO RECEIPT OF INSTRUCTIONS FROM THE DESIGN TEAM WILL BE DONE AT THE CONTRACTOR'S RISK.

ONLY PRODUCTS OF REPUTABLE MANUFACTURERS ARE ACCEPTABLE.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL EMPLOY ONLY WORKERS SKILLED IN THEIR TRADES.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

CODES AND STANDARDS
CONFORM TO ALL REQUIREMENTS OF THE CITY OF AMES CODES, LAWS, ORDINANCES AND OTHER REGULATIONS HAVING JURISDICTION.

CONFORM TO ALL STATE CODES.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION. IF THERE IS INSUFFICIENT TIME FOR THIS PROCEDURE, CONTRACTOR SHALL SUBMIT WITH THE PROPOSAL A SEPARATE PRICE TO MAKE THE SYSTEM COMPLY WITH THE CODES AND REGULATIONS.

ALL CHANGES TO THE SYSTEM MADE AFTER LETTING OF THE CONTRACT, TO COMPLY WITH CODES OR REQUIREMENTS OF INSPECTORS, SHALL BE MADE BY THE CONTRACTOR WITHOUT COST TO THE OWNER.

IF THERE IS A DISCREPANCY BETWEEN MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS, THE MANUFACTURER'S RECOMMENDATIONS SHALL GOVERN.

ALL ROTATING SHAFTS AND/OR EQUIPMENT SHALL BE COMPLETELY GUARDED FROM ALL CONTACT. PARTIAL GUARDS AND/OR GUARDS THAT DO NOT MEET ALL APPLICABLE OSHA STANDARDS ARE NOT ACCEPTABLE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING THIS GUARDING IF IT IS NOT PROVIDED WITH THE EQUIPMENT SUPPLIED.

PERMITS AND FEES
PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE APPROVED OR LISTED BY UNDERWRITER'S LABORATORIES, INC.

23 05 00 BASIC MECHANICAL REQUIREMENTS (CONT.)

SUBMITTALS
SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

1. SUBMITTALS LIST:

23 07 19	PLUMBING AND HVAC PIPING INSULATION
23 10 23	NATURAL GAS AND PROPANE PIPING
23 54 00	FORCED AIR FURNACES
23 81 26	SPLIT SYSTEM AIR CONDITIONING UNITS

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS BASED ON APPLICABLE SPECIFICATION SECTION. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

PRODUCT DELIVERY, STORAGE, AND HANDLING
EXERCISE CARE IN TRANSPORTING AND HANDLING TO AVOID DAMAGE TO MATERIALS. STORE MATERIALS ON THE SITE TO PREVENT DAMAGE. KEEP MATERIALS CLEAN, DRY AND FREE FROM HARMFUL CONDITIONS. IMMEDIATELY REMOVE ANY MATERIALS THAT BECOME WET OR THAT ARE SUSPECTED OF BECOMING CONTAMINATED WITH MOLD OR OTHER ORGANISMS.

KEEP ALL BEARINGS PROPERLY LUBRICATED AND ALL BELTS PROPERLY TENSIONED AND ALIGNED.

COORDINATE THE INSTALLATION OF HEAVY AND LARGE EQUIPMENT WITH THE GENERAL CONTRACTOR AND/OR OWNER. IF THE MECHANICAL CONTRACTOR DOES NOT HAVE PRIOR DOCUMENTED EXPERIENCE IN RIGGING AND LIFTING SIMILAR EQUIPMENT, HE/SHE SHALL CONTRACT WITH A QUALIFIED LIFTING AND RIGGING SERVICE THAT HAS SIMILAR DOCUMENTED EXPERIENCE. FOLLOW ALL EQUIPMENT LIFTING AND SUPPORT GUIDELINES FOR HANDLING AND MOVING.

CONTRACTOR IS RESPONSIBLE FOR MOVING EQUIPMENT INTO THE BUILDING AND/OR SITE. CONTRACTOR SHALL REVIEW SITE PRIOR TO BID FOR PATH LOCATION AND ANY REQUIRED BUILDING MODIFICATIONS TO ALLOW MOVEMENT OF EQUIPMENT. CONTRACTOR SHALL COORDINATE HIS/HER WORK WITH OTHER TRADES.

WARRANTY
PROVIDE MINIMUM ONE-YEAR WARRANTY COMMENCING ON DATE OF FINAL ACCEPTANCE FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. WARRANTY REQUIREMENTS SHALL EXTEND TO CORRECTION, WITHOUT COST TO OWNER, OF ALL WORK FOUND TO BE DEFECTIVE OR NONCONFORMING TO THE CONTRACT DOCUMENTS. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION
WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

OBSERVATION OF WORK
THE CONTRACTOR SHALL PROVIDE SEVEN (7) CALENDAR DAYS' NOTICE TO THE ARCHITECT/ENGINEER PRIOR TO COVERING INTERIOR PARTITIONS AND CHASES AND INSTALLING HARD OR SUSPENDED CEILINGS AND SOFFITS.

ALL WORK ABOVE THE CEILINGS MUST BE COMPLETE PRIOR TO THE ARCHITECT/ENGINEER'S REVIEW. THIS INCLUDES, BUT IS NOT LIMITED TO:
1. PIPE INSULATION IS INSTALLED AND FULLY SEALED.
2. PIPE WALL PENETRATIONS ARE SEALED.
3. PIPE IDENTIFICATION AND VALVE TAGS ARE INSTALLED.

IN ORDER TO PREVENT THE FINAL JOBSITE OBSERVATION FROM OCCURRING TOO EARLY, THE CONTRACTOR SHALL REVIEW THE COMPLETION STATUS OF THE PROJECT AND CERTIFY IN WRITING THAT THE JOB IS READY FOR THE FINAL JOBSITE OBSERVATION.

PROJECT CLOSEOUT
SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS INCLUDING REPRODUCIBLE DRAWINGS COMPLETED IN REVIT, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, AND INSPECTION BY STATE BOILER INSPECTOR.

OPERATION AND MAINTENANCE MANUALS
SUBMIT AN ELECTRONIC COPY OF THE O&M MANUALS TO THE OWNER. OPERATION AND MAINTENANCE DATA SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR THE CARE, MAINTENANCE, AND OPERATION OF THE EQUIPMENT AND SYSTEMS. INSTRUCTION BOOKS, CARDS, MANUALS FURNISHED WITH THE EQUIPMENT SHALL BE INCLUDED.

ALL TEXT SHALL BE SEARCHABLE AND BOOKMARKS SHALL BE USED, DIVIDING INFORMATION BY SPECIFICATION SECTION.

RECORD DOCUMENTS
MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF MECHANICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS; CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB, AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING
THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

END OF SECTION

SECTION 23 10 23 NATURAL GAS AND PROPANE PIPING

SECTION INCLUDES
PIPE AND PIPE FITTINGS
VALVES
NATURAL GAS PIPING SYSTEM

QUALITY ASSURANCE
VALVES: MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY. REMANUFACTURED VALVES ARE NOT ACCEPTABLE.

WELDING MATERIALS, PROCEDURES, AND OPERATORS: CONFORM TO ASME SECTION 9, ANSI/AWS D1.1, AND APPLICABLE STATE LABOR REGULATIONS.

WELDERS CERTIFICATION: IN ACCORDANCE WITH ANSI/ASME SEC 9 OR ANSI/AWS D1.1.

DESIGN HANGERS AND SUPPORTS UNDER DIRECT SUPERVISION OF PROFESSIONAL ENGINEER EXPERIENCED IN DESIGN OF THIS WORK AND LICENSED IN STATE OF CALIFORNIA. [SPECIFIER: CALIFORNIA PROJECTS]

SUBMITTALS
SUBMIT PRODUCT DATA UNDER PROVISIONS OF SECTION 22 05 00. INCLUDE DATA ON PIPE MATERIALS, FITTINGS, VALVES, AND ACCESSORIES.

TEST REPORTS: PROVIDE RESULTS OF PIPING SYSTEM PRESSURE TEST.

WELDERS CERTIFICATES: CERTIFY WELDERS EMPLOYED ON THE WORK, VERIFYING AWS QUALIFICATION WITHIN PREVIOUS 12 MONTHS.

NATURAL GAS (0 TO 125 PSI)
DESIGN PRESSURE: 125 PSI.
MAXIMUM DESIGN TEMPERATURE: 350ºF

PIPING - 2" AND UNDER:
1. PIPE: STANDARD WEIGHT STEEL, THREADED AND COUPLED, ASTM A53.
2. JOINTS: SCREWED. (NOTE: FOR BELOW GROUND, ALL SIZES TO HAVE WELDED JOINTS.)
3. FITTINGS: 150# STEAM - 300# CWP, BLACK MALLEABLE IRON, BANDED, ASTM A197, ANSI B16.3.
4. UNIONS: 250# - 500# CWP, BLACK MALLEABLE IRON, ANSI B16.39, GROUND JOINT WITH BRASS SEAT.

PIPING – 2" AND UNDER:
1. PIPE: CORRUGATED STAINLESS STEEL TUBING, ASTM A240 SERIES 300 STAINLESS STEEL, ANSI AGA-LC1.
2. JACKET: POLYETHYLENE.
3. FITTINGS: BRASS WITH MECHANICAL ENDS TO FIT TUBING. ASME B1.20.1 THREADED ENDS FOR CONNECTIONS TO THREADED PIPES AND COMPONENTS.
4. STRIKER PLATES: MINIMUM 16 GAUGE HARDENED STEEL, CORROSION RESISTANT, PRIMED AND ZINC COATED. INSTALL TO PROTECT TUBING FROM PENETRATIONS.
5. LIMITS: 5 PSI OR LESS. FOR USE ONLY AT TERMINATION TO FIXED OUTLETS OR EQUIPMENT, MAXIMUM LENGTH: 48". PROVIDE MALLEABLE IRON, FLANGE MOUNTED, STRAIGHT OR 90 FITTING AT WALL TERMINATION WITH MAXIMUM 12" LENGTH OF TUBING ON INLET OF FLANGE.
6. ACCEPTABLE MANUFACTURERS: TRACPIPE, GASTITE, PARKER (PARFLEX), PROFLEX (1 YELLOW CSST).

PIPING - 2-1/2" AND OVER:
1. PIPE: STANDARD WEIGHT STEEL, BEVELED ENDS, ASTM A53.
2. JOINTS: BUTT WELDED AND FLANGED.
3. FITTINGS: STANDARD WEIGHT SEAMLESS STEEL, BUTT WELD TYPE, ASTM A234, GRADE I, ANSI B16.9.
4. FLANGES: 150# FORGED STEEL, WELD NECK OR SLIP -ON, ASTM A181, GRADE I, ANSI B16.5. FLANGE FACE SEAL WELD (BACKWELD) IS REQUIRED FOR SLIP-ON FLANGES.

SHUTOFF VALVES/THROTTLING VALVES:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, SHUTOFF VALVES WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

BA-13: 2" AND UNDER, THREADED 600 PSI CWP; UL LISTED FOR 250# LP, FLAMMABLE LIQUID, HEATING OIL, NATURAL AND MANUFACTURED GASES, 150 PSI STEAM, BRONZE BODY AND CHROME PLATED BRASS BALL, TEFLON SEATS AND PACKING. APOLLO #80-100, NIBCO #T580-70-UL OR #T585-70-UL, WATTS #B-6000.

PL-1: 2" AND UNDER, 125# STEAM @ 450ºF, 175# CWP @ 180ºF, CAST IRON BODY, SCREWED, FULL PORT. WALWORTH #1700, DEZURIK #425, S-RS49.

CHECK VALVES:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, CHECK VALVES WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

CK-1: 2" AND UNDER, 125# STEAM @ 406ºF, 200# CWP @ 150ºF, SCREWED, BRONZE, HORIZONTAL SWING. CRANE #37, HAMMOND #IB904, STOCKHAM #B319-Y, WALWORTH #3406, MILWAUKEE #509, WATTS #B-5000, NIBCO Y-413B.

CK-13: 2-1/2" THRU 12", 200# CWP, DOUBLE DISC WAFER TYPE, IRON BODY, BRONZE OR ALUMINUM-BRONZE DISCS, 316SS SHAFT AND SPRING, VITON, EPDM OR BUNA-N, CV'KY OF AT LEAST 700603 IN 6"1 SIZE. MUELLER STEAM SPECIALTY CO. #71-AHB-6-H, STOCKHAM #WG-961 EPDM OR #WG970 BUNA, NIBCO W-920-W, CRANE.

STRAINERS:
FOR PIPE SYSTEMS WHERE MECHANICAL PRESS CONNECTIONS ARE ALLOWED, STRAINERS WITH MECHANICAL PRESS CONNECTIONS ARE ACCEPTABLE SUBJECT TO THE REQUIREMENTS IN THE PARAGRAPHS BELOW.

ST-2: CAST IRON BODY, 125 LB.CLASS 125 FLANGED ENDS, BOLTED COVER, 125 PSI S @ 350°F, 175 PSI CWP @ 150°F. ARMSTRONG #A1FL, METRAFLEX #TF, MUELLER STEAM SPECIALTY CO.#751, SARCO #CI-125, WATTS #77F-D.

ST-4: CAST IRON BODY, SCREWED ENDS, SCREWED COVER, 250# STEAM @ 406°F, 300 # CWP @ 150°F. ARMSTRONG #A1SC, METRAFLEX #SM, MUELLER STEAM SPECIALTY CO. #11, SARCO #IT.

PREPARATION
REAM PIPE AND TUBE ENDS, REMOVE BURRS, BEVEL PLAIN END FERROUS PIPE.

REMOVE SCALE AND DIRT ON INSIDE AND OUTSIDE BEFORE ASSEMBLY.

REMOVE ALL SCALE, RUST, DIRT, OILS, STICKERS AND THOROUGHLY CLEAN EXTERIOR OF ALL BARE METAL EXPOSED PIPING, HANGERS, AND ACCESSORIES IN PREPARATION TO BE PAINTED.

CONNECT TO ALL EQUIPMENT WITH FLANGES OR UNIONS.

AFTER COMPLETION, FILL, CLEAN, AND TREAT SYSTEMS. REFER TO SECTION 23 25 00 FOR TREATMENT.

TESTING PIPING
LOW PRESSURE - UP TO 1 PSI: TEST PIPING WITH 20 PSI AIR PRESSURE. SYSTEM MUST HOLD THIS PRESSURE WITHOUT ADDING AIR FOR TWO HOURS.

HIGH PRESSURE - ABOVE 1 PSI: TEST PIPING WITH COMPRESSED AIR AT TWICE THE OPERATING GAS PRESSURE, BUT AT LEAST 20 PSI. SYSTEM MUST HOLD THIS PRESSURE WITHOUT ADDING AIR FOR TWO HOURS.

A NON-COMBUSTIBLE ODORANT, SUCH AS OIL OF WINTERGREEN, MAY BE ADDED TO HELP LOCATE LEAKS.

CLEANING PIPING & ASSEMBLY
PRIOR TO ASSEMBLY OF PIPE AND PIPING COMPONENTS, REMOVE ALL LOOSE DIRT, SCALE, OIL AND OTHER FOREIGN MATTER ON INTERNAL OR EXTERNAL SURFACES BY MEANS CONSISTENT WITH GOOD PIPING PRACTICE SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER. BLOW CHIPS AND BURRS OUT OF PIPE BEFORE ASSEMBLY. WIPE CUTTING OIL FROM INTERNAL AND EXTERNAL SURFACES.

DURING FABRICATION AND ASSEMBLY, REMOVE SLAG AND WELD SPATTER FROM BOTH INTERNAL AND EXTERNAL JOINTS BY PEENING, CHIPPING AND WIRE BRUSHING TO THE DEGREE CONSISTENT WITH GOOD PIPING PRACTICES.

NOTIFY THE ARCHITECT/ENGINEER PRIOR TO STARTING ANY POST ERECTION CLEANING OPERATION IN TIME TO ALLOW WITNESSING THE OPERATION. PROPERLY DISPOSE OF CLEANING AND FLUSHING FLUIDS.

SECTION 23 10 23 NATURAL GAS AND PROPANE PIPING (CONT.)

PRIOR TO BLOWING OR FLUSHING ERECTED PIPING SYSTEMS, DISCONNECT ALL INSTRUMENTATION AND EQUIPMENT, OPEN WIDE ALL VALVES, CONTROL VALVES, AND BALANCE VALVES, AND VERIFY ALL STRAINER SCREENS ARE IN PLACE.

INSTALLATION
ROUTE PIPING IN ORDERLY MANNER, STRAIGHT, PLUMB, WITH CONSISTENT PITCH, PARALLEL TO BUILDING STRUCTURE, WITH MINIMUM USE OF OFFSETS AND COUPLINGS. PROVIDE ONLY OFFSETS REQUIRED FOR NEEDED HEADROOM OR CLEARANCE AND NEEDED FLEXIBILITY IN PIPE SYSTEM.

INSTALL PIPING TO CONSERVE BUILDING SPACE, AND NOT INTERFERE WITH OTHER WORK.

DO NOT INSTALL PIPING OR OTHER EQUIPMENT ABOVE ELECTRICAL SWITCHBOARDS OR PANELBOARDS. THIS INCLUDES A DEDICATED SPACE EXTENDING 25 FEET FROM THE FLOOR TO THE STRUCTURAL CEILING WITH WIDTH AND DEPTH EQUAL TO THE EQUIPMENT.

GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.

INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.

PROVIDE CHAIN OPERATORS FOR ALL VALVES OVER 2" SIZE THAT ARE OVER 10'-0" ABOVE FINISHED FLOOR. EXTEND TO 7'-0" ABOVE FINISHED FLOOR.

PROVIDE VALVE POSITION INDICATOR ON ALL VALVES 10'-0" OR GREATER ABOVE FINISH FLOOR AND NOT LOCATED ABOVE CEILING.

PROVIDE CLEARANCE FOR ACCESS TO VALVES AND FITTINGS.

PROVIDE ACCESS DOORS WHERE VALVES ARE NOT EXPOSED.

PREPARE PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISH PAINTING.

INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

PROVIDE SHUTOFF VALVES AND FLANGES OR UNIONS AT ALL CONNECTIONS TO EQUIPMENT, TRAPS, AND ITEMS THAT REQUIRE SERVICING.

PROVIDE SHUTOFF VALVES TO ISOLATE PART OF SYSTEMS AND VERTICAL RISERS.

ARRANGE PIPING AND PIPING CONNECTIONS SO EQUIPMENT MAY BE SERVICED OR TOTALLY REMOVED WITHOUT DISTURBING PIPING BEYOND FINAL CONNECTIONS AND ASSOCIATED SHUTOFF VALVES.

REDUCERS ARE GENERALLY NOT SHOWN. WHERE PIPE SIZES ARE NOT SHOWN, THE LARGER SIZE IN EITHER DIRECTION SHALL CONTINUE THROUGH THE FITTING NEAREST TO THE INDICATION OF A SMALLER PIPE SIZE.

BONDING AND GROUNDING
EACH ABOVE GROUND PORTION OF A CORRUGATED STAINLESS STEEL TUBING GAS PIPING SYSTEMS SHALL BE BONDED TO THE ELECTRICAL SERVICE GROUNDING ELECTRODE SYSTEM. THE BONDING JUMPER SHALL CONNECT TO A METALLIC PIPE OR FITTING BETWEEN THE POINT OF DELIVERY AND THE FIRST DOWNSTREAM CORRUGATED STAINLESS STEEL TUBE FITTING. THE BONDING JUMPER SHALL NOT BE SMALLER THAN 6 AWG COPPER WIRE OR EQUIVALENT. GAS PIPING SYSTEMS THAT CONTAIN ONE OR MORE SEGMENTS OF CORRUGATED STAINLESS STEEL TUBING SHALL BE BONDED IN ACCORDANCE WITH THIS SECTION.

EACH ABOVE GROUND PORTION OF A GAS PIPING SYSTEM, OTHER THAN CORRUGATED STAINLESS STEEL TUBING SYSTEMS, THAT IS LIKELY TO BECOME ENERGIZED SHALL BE ELECTRICALLY CONTINUOUS AND BONDED TO AN EFFECTIVE GROUND-FAULT CURRENT PATH. GAS PIPING, OTHER THAN CORRUGATED STAINLESS STEEL TUBING, SHALL BE CONSIDERED TO BE BONDED WHEN IT IS CONNECTED TO APPLIANCES THAT ARE CONNECTED TO THE APPLIANCE GROUNDING CONDUCTOR OF THE CIRCUIT SUPPLYING THAT APPLIANCE.

GAS PIPING SHALL NOT BE USED AS A GROUNDING CONDUCTOR OR ELECTRODE.

WHERE A LIGHTNING PROTECTION SYSTEM IS INSTALLED, THE BONDING OF THE GAS PIPING SHALL BE IN ACCORDANCE WITH NFPA 780, STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS.

PIPE ERECTION AND LAYING
CAREFULLY INSPECT ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES PRIOR TO INSTALLATION. IMMEDIATELY REJECT AND REMOVE FROM THE JOB ANY ITEMS WHICH ARE UNSUITABLE, CRACKED OR OTHERWISE DEFECTIVE.

ALL PIPE, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES SHALL HAVE FACTORY-APPLIED MARKINGS, STAMPINGS, OR NAMEPLATES SUFFICIENT TO DETERMINE THEIR CONFORMANCE WITH SPECIFIED REQUIREMENTS.

EXERCISE CARE AT EVERY STAGE OF STORAGE, HANDLING, LAYING AND ERECTING TO PREVENT ENTRY OF FOREIGN MATTER INTO PIPING, FITTINGS, VALVES, EQUIPMENT AND ACCESSORIES. DO NOT ERECT OR INSTALL ANY UNCLEAN ITEM.

DURING CONSTRUCTION, UNTIL SYSTEM IS FULLY OPERATIONAL, KEEP ALL OPENINGS IN PIPING AND EQUIPMENT CLOSED AT ALL TIMES EXCEPT WHEN ACTUAL WORK IS BEING PERFORMED ON THAT ITEM. CLOSURES SHALL BE PLUGS, CAPS, BLIND FLANGES OR OTHER ITEMS DESIGNED FOR THIS PURPOSE.

CHANGE DIRECTION OF PIPES ONLY WITH FITTINGS OR PIPE BENDS. CHANGE SIZE ONLY WITH FITTINGS. DO NOT USE MITER FITTINGS, FACE OR FLUSH BUSHINGS, OR STREET ELBOWS. ALL FITTINGS SHALL BE LONG RADIUS TYPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED. CONSTRUCT WELDED ELBOWS OF ANGLES NOT AVAILABLE AS STANDARD FITTINGS BY CUTTING AND WELDING STANDARD ELBOWS TO FORM SMOOTH, LONG RADIUS FITTINGS.

USE FULL AND DOUBLE LENGTHS OF PIPE WHEREVER POSSIBLE.

CUT ALL PIPE TO EXACT MEASUREMENT AND INSTALL WITHOUT SPRINGING OR FORCING.

DO NOT CREATE, EVEN TEMPORARILY, UNDUE LOADS, FORCES OR STRAINS ON VALVES, EQUIPMENT OR BUILDING ELEMENTS.

DRAINING AND VENTING
UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL HORIZONTAL PIPES, INCLUDING BRANCHES, SHALL PITCH 1" IN 40 FEET12 TO LOW POINTS FOR COMPLETE DRAINAGE.

USE ECCENTRIC REDUCING FITTINGS ON HORIZONTAL RUNS WHEN CHANGING SIZE FOR PROPER DRAINAGE AND VENTING. INSTALL GAS PIPES WITH BOTTOM OF PIPE AND ECCENTRIC REDUCERS IN A CONTINUOUS LINE.

PROVIDE DRIP LEGS AT LOW POINTS AND AT THE BASE OF ALL RISERS IN GAS PIPES. DRIP LEGS SHALL BE FULL LINE SIZE ON PIPES THROUGH 4" AND AT LEAST 4", BUT NOT LESS THAN HALF LINE SIZE OVER 4". DRIP LEGS SHALL BE 12" MINIMUM LENGTH, CAPPED WITH A REDUCER TO A DRAIN VALVE.

BRANCH CONNECTIONS
MAKE BRANCH CONNECTIONS WITH STANDARD TEE OR CROSS FITTINGS OF THE TYPE REQUIRED FOR THE SERVICE UNLESS OTHERWISE SPECIFIED HEREIN OR DETAILED ON THE DRAWINGS.

AT THE OPTION OF THE CONTRACTOR, BRANCH CONNECTIONS FROM HEADERS AND MAINS MAY BE CUT INTO BLACK STEEL PIPE USING FORGED WELD -ON FITTINGS.

USE OF FORGED WELD-ON FITTIN

22/23 07 19 PLUMBING AND HVAC PIPING INSULATION

SECTION INCLUDES
PIPING INSULATION
INSULATION JACKETS

QUALITY ASSURANCE
MATERIALS: FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 IN ACCORDANCE WITH ASTM E84, NFPA 255, OR UL 723 (WHERE REQUIRED).

INSULATION MATERIALS
TYPE A: GLASS FIBER; ANSI/ASTM C547; 0.24 MAXIMUM 'K' VALUE AT 75F; NON-COMBUSTIBLE. ALL PURPOSE, WHITE KRAFT JACKET BONDED TO ALUMINUM FOIL AND REINFORCED WITH FIBERGLASS YARN; 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723).

TYPE B: ELASTOMERIC CELLULAR FOAM; ANSI/ASTM C534; FLEXIBLE PLASTIC; 0.27 MAXIMUM 'K' VALUE AT 75F, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723). MAXIMUM 1" THICK PER LAYER WHERE MULTIPLE LAYERS ARE SPECIFIED.

VAPOR BARRIER JACKETS
KRAFT REINFORCED FOIL VAPOR BARRIER WITH SELF-SEALING ADHESIVE JOINTS. BEACH PUNCTURE RESISTANCE RATIO OF AT LEAST 50 UNITS. TENSILE STRENGTH: 35 PSI MINIMUM. SINGLE, SELF-SEAL ACRYLIC ADHESIVE ON LONGITUDINAL JACKET LAPS AND BUTT STRIPS.

REFRIGERANT PIPE COUPLING
INSULATION COUPLING: MOLDED THERMOPLASTIC ASTM D1525, -65F TO 275F, SIZES UP TO 4-1/8" O.D., AND RECEIVE INSULATION THICKNESS UP TO 1". SUITABLE FOR USE INDOORS OR OUTDOORS WITH UV STABILIZERS.

ACCEPTABLE MANUFACTURERS: KLO-SHURE OR EQUAL.

PREPARATION
INSTALL INSULATION AFTER PIPING HAS BEEN TESTED. PIPE SHALL BE CLEAN, DRY AND FREE OF RUST BEFORE APPLYING INSULATION.

GENERAL INSTALLATION REQUIREMENTS
INSTALL MATERIALS PER MANUFACTURER'S INSTRUCTIONS, BUILDING CODES AND INDUSTRY STANDARDS.

CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PENETRATIONS. THIS APPLIES TO ALL INSULATED PIPING. MAINTAIN FIRE RATING OF ALL PENETRATIONS.

NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS.

ON ALL INSULATED PIPING, PROVIDE AT EACH SUPPORT AN INSERT OF SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION, BETWEEN THE PIPE AND INSULATION JACKET. TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE INSERT SHALL BE SUITABLE FOR PLANNED TEMPERATURES, BE SUITABLE FOR USE WITH SPECIFIC PIPE MATERIAL, AND SHALL BE A 180 CYLINDRICAL SEGMENT THE SAME LENGTH AS METAL SHIELDS. INSERTS SHALL BE A CELLULAR GLASS (FOR ALL TEMPERATURE RANGES) OR MOLDED HYDROUS CALCIUM SILICATE (FOR PIPE WITH OPERATING TEMPERATURES ABOVE 70F, WITH A MINIMUM COMPRESSIVE STRENGTH OF 50 PSI. POLYISOCYANURATE INSULATION WITH A MINIMUM COMPRESSIVE STRENGTH OF 24 PSI IS ACCEPTABLE FOR PIPE SIZES 3" AND BELOW, MINIMUM 60 PSI FOR PIPE SIZES 4", AND OPERATE BELOW 300F. FACTORY FABRICATED INSERTS MAY BE USED. RECTANGULAR BLOCKS, PLUGS, OR WOOD MATERIAL ARE NOT ACCEPTABLE. TEMPORARY WOOD BLOCKING MAY BE USED BY THE PIPING CONTRACTOR FOR PROPER HEIGHT; HOWEVER, THESE MUST BE REMOVED AND REPLACED WITH PROPER INSERTS BY THE INSULATION CONTRACTOR.

INSTALL METAL SHIELDS BETWEEN ALL HANGERS OR SUPPORTS AND THE PIPE INSULATION. SHIELDS SHALL BE GALVANIZED SHEET METAL, HALF_ROUND WITH FLARED EDGES. ADHERE SHIELDS TO INSULATION. ON COLD PIPING, SEAL THE SHIELDS VAPOR-TIGHT TO THE INSULATION AS REQUIRED TO MAINTAIN THE VAPOR BARRIER, OR ADD SEPARATE VAPOR BARRIER JACKET.

SHIELDS SHALL BE AT LEAST THE FOLLOWING LENGTHS AND GAUGES:
PIPE SIZE; SHIELD SIZE:
1/2" TO 3" PIPE 12" LONG X 18 GAUGE
4" PIPE 12" LONG X 16 GAUGE
5" TO 6" PIPES 8" LONG X 16 GAUGE
8" TO 14" PIPES24" LONG X 14 GAUGE
16" TO 24" PIPES 24" LONG X 12 GAUGE

ALL PIPING AND INSULATION THAT DOES NOT MEET 25/50 THAT IS LOCATED IN AN AIR PLENUM SHALL HAVE WRITTEN APPROVAL FROM THE AUTHORITY HAVING JURISDICTION AND THE LOCAL FIRE DEPARTMENT FOR AUTHORIZATION AND MATERIALS APPROVAL. IF APPROVAL HAS BEEN ALLOWED, THE NON-RATED MATERIAL SHALL BE WRAPPED WITH A PRODUCT THAT HAS PASSED ASTM E84 AND/OR NFPA 255 TESTING WITH A RATING OF 25/50 OR BELOW.

INSULATED PIPING OPERATING BELOW 60F
INSULATE FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, FLEXIBLE HOSES, AND EXPANSION JOINTS. SEAL ALL PENETRATIONS OF VAPOR BARRIER.

ON PIPING OPERATING BELOW 60F IN LOCATIONS THAT ARE NOT MECHANICALLY COOLED (E.G., PENTHOUSES, MECHANICAL ROOMS, TUNNELS, CHASES AT EXTERIOR WALLS, ETC.), TYPE B INSULATION SHALL BE USED.

ALL BALANCE VALVES WITH FLUID OPERATING BELOW 60F SHALL BE INSULATED WITH A REMOVABLE PLUG WRAPPED WITH VAPOR BARRIER TAPE TO ALLOW READING AND ADJUSTING OF THE VALVE.

INSULATED PIPING OPERATING BETWEEN 60F AND 140F
DO NOT INSULATE FLANGES AND UNIONS, BUT BEVEL AND SEAL ENDS OF INSULATION AT SUCH LOCATIONS. INSULATE ALL FITTINGS, VALVES AND STRAINERS.

INSULATED PIPING OPERATING ABOVE 140F
INSULATE FITTINGS, VALVES, FLANGES, AND STRAINERS.

ALL BALANCE VALVES WITH FLUID OPERATING ABOVE 140F SHALL BE INSULATED AND AN OPENING SHALL BE LEFT IN THE INSULATION TO ALLOW FOR READING AND ADJUSTING THE VALVE.

REFRIGERANT PIPING
ON REFRIGERANT PIPING (25F AND ABOVE) AND NOT REQUIRED TO MEET THE 25/50 FLAME/SMOKE, PROVIDE AT EACH STRUT OR CLEVIS SUPPORT AN INSULATION COUPLING TO SUPPORT PIPE AND TO ACCEPT INSULATION THICKNESS OF ADJOINING INSULATION, TO PREVENT INSULATION FROM SAGGING AND CRUSHING. THE COUPLING SHALL BE SUITABLE FOR PLANNED TEMPERATURES, USE WITH SPECIFIED PIPE MATERIAL, AND SHALL BE A 360, ONE-PIECE CYLINDRICAL SEGMENT. USE MECHANICAL FASTENERS WHERE COUPLING CANNOT BE INSTALLED ON PIPE DURING INSTALLATION. CONTRACTOR SHALL APPLY ADHESIVE TO ENDS OF INSULATION ENTERING INSULATION COUPLING TO MAINTAIN VAPOR BARRIER.

EXPOSED PIPING
LOCATE AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.

WHERE EXPOSED INSULATED PIPING EXTENDS ABOVE THE FLOOR, PROVIDE A SHEET METAL GUARD AROUND THE INSULATION EXTENDING 12" ABOVE THE FLOOR. GUARD SHALL BE 0.016" CYLINDRICAL SMOOTH OR STUCCO ALUMINUM AND SHALL FIT TIGHTLY TO THE INSULATION.

INSULATION INSTALLATION
TYPE A INSULATION:
1. ALL SERVICE JACKETS: SEAL ALL LONGITUDINAL JOINTS WITH SELF_SEAL LAPS USING A SINGLE PRESSURE SENSITIVE ADHESIVE SYSTEM. DO NOT STAPLE.
2. INSULATION WITHOUT SELF-SEAL LAP MAY BE USED IF INSTALLED WITH BENJAMIN FOSTER 85_20 OR EQUIVALENT CHICAGO MASTIC, 3M OR CHILDERS LAP ADHESIVE.
3. APPLY INSULATION WITH LAPS ON TOP OF PIPE.
4. FITTINGS, VALVE BODIES AND FLANGES: FOR 4" AND SMALLER PIPES, INSULATE WITH 1 LB DENSITY INSULATION WRAPPED UNDER COMPRESSION TO A THICKNESS EQUAL TO THE ADJACENT PIPE INSULATION. FOR PIPES OVER 4", USE MITERED SEGMENTS OF PIPE INSULATION. FINISH WITH PREFORMED PLASTIC FITTING COVERS. SECURE FITTING COVERS WITH PRESSURE SENSITIVE TAPE AT EACH END. OVERLAP TAPE AT LEAST 2" ON ITSELF. FOR PIPES OPERATING BELOW 60F, SEAL FITTING COVERS WITH VAPOR RETARDER MASTIC IN ADDITION TO TAPE.

22/23 07 19 PLUMBING AND HVAC PIPING INSULATION (CONT.)

TYPE B INSULATION:
1. ELASTOMERIC CELLULAR FOAM: WHERE POSSIBLE, SLIP INSULATION OVER THE OPEN END OF PIPE WITHOUT SLITTING. SEAL ALL BUTT ENDS, LONGITUDINAL SEAMS, AND FITTINGS WITH ADHESIVE. AT ELBOWS AND TEES, USE MITERED CONNECTIONS. DO NOT COMPRESS OR CRUSH INSULATION AT CEMENTED JOINTS. JOINTS SHALL BE SEALED COMPLETELY AND NOT PUCKER OR WRINKLE. PAINT THE OUTSIDE OF OUTDOOR INSULATION WITH TWO COATS OF LATEX ENAMEL PAINT RECOMMENDED BY THE MANUFACTURER.
2. SELF-SEAL INSULATION MAY BE USED ON PIPES OPERATING BELOW 170F.

PLASTIC COVERING:
1. PROVIDE VAPOR BARRIER AS SPECIFIED FOR INSULATION TYPE. COVER WITH PLASTIC JACKET COVERING. POSITION SEAMS TO SHED WATER.
2. SOLVENT WELD ALL JOINTS WITH MANUFACTURER RECOMMENDED CEMENT.
3. OVERLAP ALL LAPS AND BUTT JOINTS 1-1/2" MINIMUM. REPAIR ANY LOOSE ENDS THAT DO NOT SEAL SECURELY. SOLVENT WELD ALL FITTING COVERS IN THE SAME MANNER. FINAL INSTALLATION SHALL BE WATERTIGHT.
4. ALL JOINTS IN AREAS NOTED SHALL MEET USDA STANDARDS FOR TOTALLY SEALED SYSTEMS, INCLUDING OVERLAPS OF 1" ON CIRCUMFERENTIAL AND 1.5" TO 2" ON LONGITUDINAL SEAMS.
5. USE PLASTIC INSULATION COVERING ON ALL EXPOSED PIPES INCLUDING, BUT NOT LIMITED TO:
A. ALL PIPING IN MECHANICAL ROOMS AND/OR TUNNELS THAT IS SUBJECT TO DAMAGE FROM NORMAL OPERATIONS. (EXAMPLE: PIPING THAT MUST BE STEPPED OVER ROUTINELY.)
6. ELASTOMERIC PIPING INSULATION MAY HAVE TWO COATS OF LATEX PAINT INSTEAD OF PLASTIC JACKET.
7. USE COLORED PLASTIC COVERING ON THE FOLLOWING PIPES:
a. ALL EXTERIOR PIPING.

END OF SECTION

SECTION 23 81 26 - SPLIT SYSTEM AIR CONDITIONING UNITS

WARRANTY
PROVIDE FIVE (5) YEAR MANUFACTURER'S WARRANTY ON ALL COMPRESSORS.

SPLIT SYSTEM WALL AND CEILING-MOUNTED UNITS
ACCEPTABLE MANUFACTURERS: CARRIER/TOSHIBA; PANASONIC; LG; SANYO; SAMSUNG; DAIKIN APPLIED; MITSUBISHI

MANUFACTURED UNITS: PROVIDE PACKAGED, AIR-COOLED, FACTORY ASSEMBLED, PRE-WIRED, AND PRE -PIPED UNIT CONSISTING OF CABINET, FANS, FILTERS, REMOTE CONDENSING UNIT, AND CONTROLS. WALL -MOUNTED UNITS SHALL BE FURNISHED WITH INTEGRAL WALL MOUNTING BRACKET AND MOUNTING HARDWARE. ASSEMBLE UNIT FOR WALL-MOUNTED OR CEILING INSTALLATION WITH SERVICE ACCESS REQUIRED.

PERFORMANCE SHALL BE AS SCHEDULED ON THE DRAWINGS. UNIT SHALL BE RATED PER AHRI STANDARDS 210/240 AND LISTED IN THE AHRI DIRECTORY AS A MATCHED SYSTEM. PROVIDE UNIT WITH FACTORY-SUPPLIED CLEANABLE AIR FILTERS. THE UNITS SHALL BE LISTED BY ELECTRICAL LABORATORIES (ETL) IN ACCORDANCE WITH UL-1995 CERTIFICATION AND BEAR THE ETL LABEL. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC).

OUTDOOR UNIT
GENERAL: THE OUTDOOR UNIT SHALL BE SPECIFICALLY MATCHED TO THE CORRESPONDING INDOOR UNIT SIZE. THE OUTDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED AND PRE-WIRED WITH ALL NECESSARY ELECTRONIC AND REFRIGERANT CONTROLS.

CABINET: THE OUTDOOR UNIT SHALL BE FABRICATED OF GALVANIZED STEEL, BONDERIZED, AND COATED WITH A BAKED ENAMEL FINISH FOR CORROSION PROTECTION.

FAN: THE FAN SHALL BE DIRECT DRIVE, PROPELLER TYPE FAN WITH FAN GUARD. FAN BLADES SHALL BE STATICALLY AND DYNAMICALLY BALANCED. THE FAN SHALL HAVE PERMANENTLY LUBRICATED TYPE BEARINGS.

MOTOR SHALL BE PROTECTED BY INTERNAL THERMAL OVERLOAD PROTECTION. AIRFLOW SHALL BE HORIZONTAL DISCHARGE.

COIL: THE OUTDOOR COIL SHALL BE NONFERROUS CONSTRUCTION WITH CORRUGATED FIN TUBE. THE COIL SHALL BE PROTECTED WITH AN INTERNAL GUARD. REFRIGERANT FLOW FROM THE CONDENSER SHALL BE CONTROLLED VIA A METERING DEVICE.

COMPRESSOR: HERMETIC OR SCROLL REFRIGERANT COMPRESSORS WITH RESILIENT SUSPENSION SYSTEM, INVERTER DRIVEN, OIL STRAINER, SIGHT GLASS/MOISTURE INDICATOR, INTERNAL MOTOR PROTECTION, HIGH PRESSURE SWITCH, AND CRANKCASE HEATER. THE OUTDOOR UNIT SHALL HAVE AN ACCUMULATOR AND FOUR-WAY REVERSING VALVE.

REFRIGERANT: UNIT SHALL USE R-410A.THE USE OF CHLOROFLUOROCARBON (CFC)-BASED REFRIGERANTS IS PROHIBITED.

INTEGRAL CONDENSATE PUMP: PACKAGED UNIT MATCHED TO EVAPORATOR UNIT INCLUDING FLOAT SWITCH, PUMP, MOTOR ASSEMBLY, CHECK VALVE, AND RESERVOIR. PROVIDE ALARM TO INDICATE HIGH LEVEL RESERVOIR. UNIT SHALL BE POWERED FROM EVAPORATOR UNIT WITH APPROPRIATE FIELD CONNECTIONS AVAILABLE.

REFRIGERANT PIPING: DESIGN PRESSURE: 450 PSIG. MAXIMUM DESIGN TEMPERATURE: 250 F. PIPING - 4" AND UNDER. TUBING: TYPE ACR SEAMLESS COPPER TUBE LINESETS, ASTM B1003. SIZES INDICATED ARE NOMINAL DESIGNATION. JOINTS: BRAZED WITH SILVER SOLDER. FITTINGS: WROUGHT COPPER SOLDER JOINT, ANSI B16.22. SPECIAL REQUIREMENTS: ALL TUBING SHALL BE CLEANED, DEHYDRATED, PRESSURIZED WITH DRY NITROGEN, PLUGGED, AND TAGGED BY MANUFACTURER "FOR REFRIGERATION SERVICE". DURING BRAZING OPERATIONS, CONTINUOUSLY PURGE THE INTERIOR OF THE PIPE WITH NITROGEN TO PREVENT OXIDE FORMATION. REFRIGERANT LINESETS ARE PERMITTED. PROVIDE REFRIGERANT LINESETS AND ACCESSORIES OF SIZES NEEDED FOR INSTALLATION. VERIFY LENGTHS OF PIPING REQUIRED FOR INSTALLATION.

INSULATION: EPDM (NBR/PVC BLEND IS NOT PERMITTED) ELASTOMERIC CELLULAR FOAM; ANSI/ASTM C534; FLEXIBLE PLASTIC; 0.25 MAXIMUM 'K' VALUE AT 75ºF, 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING WHEN TESTED IN ACCORDANCE WITH ASTM E84 (UL 723). MINIMUM 1/2" THICK FOR PIPE SIZES < 1-1/4" AND 3/4" THICK FOR PIPE SIZES 1-1/4" AND ABOVE.

INSTALLATION
GENERAL INSTALLATION REQUIREMENTS: VERIFY THAT PROPER POWER SUPPLY IS AVAILABLE. INSTALL UNITS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL ALL UNITS LEVEL AND PLUMB. INDOOR UNITS SHALL BE INSTALLED USING MANUFACTURER'S STANDARD MOUNTING HARDWARE SECURELY FASTENED TO BUILDING STRUCTURE.

COORDINATE THE EXACT MOUNTING LOCATION OF ALL INDOOR AND OUTDOOR UNITS WITH ARCHITECTURAL AND ELECTRICAL WORK. COORDINATE INSTALLATION OF CEILING-MOUNTED UNITS WITH CEILING GRID LAYOUT. PROVIDE ADDITIONAL CEILING GRID REINFORCEMENT OR MODIFICATION AS REQUIRED AND COORDINATE THE WORK WITH THE GC. LOCATE THE INDOOR UNIT WHERE IT IS READILY ACCESSIBLE FOR MAINTENANCE AND FILTER CHANGES. WHERE OUTDOOR UNITS ARE LOCATED ON THE ROOF, LOCATE AT LEAST 10' FROM THE ROOF EDGE.

VERIFY LOCATIONS OF WALL-MOUNTED REMOTE CONTROLLERS WITH DRAWINGS AND ROOM DETAILS BEFORE INSTALLATION. COORDINATE MOUNTING HEIGHTS TO BE CONSISTENT WITH OTHER WALL-MOUNTED DEVICES. HEIGHT ABOVE FINISHED FLOOR SHALL NOT EXCEED 48".

REFRIGERANT PIPING: INSTALL REFRIGERANT PIPING FROM THE INDOOR UNIT(S) TO THE CONDENSING UNIT. REFRIGERANT PIPE SIZES, LENGTHS, SPECIALTIES AND CONFIGURATIONS SHALL BE AS RECOMMENDED BY THE MANUFACTURER. EVACUATE REFRIGERANT PIPING AND FULLY CHARGE SYSTEM WITH REFRIGERANT PER MANUFACTURER'S REQUIREMENTS. PROVIDE WEATHERTIGHT INSULATED ROOF CURB TO ACCOMMODATE REFRIGERANT PIPING AND CONDUIT ROOF PENETRATIONS. INSULATE ALL REFRIGERANT PIPING. ALL REFRIGERANT PIPING INSTALLED UNDERGROUND SHALL BE PROPERLY SLEEVED AND INSULATED PER MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS. CONDUITS FOR PIPING SHALL BE SEALED WATERTIGHT AND SHALL NOT RETAIN WATER.

INSULATION: INSULATE ALL REFRIGERANT PIPES BETWEEN THE HEAT PUMP AND INDOOR UNITS. THIS INCLUDES THE LIQUID PIPE, THE SUCTION PIPE, THE HOT GAS PIPE, AND THE HIGH/LOW PRESSURE GAS PIPE. ALL FITTINGS, VALVES, AND SPECIALTY REFRIGERANT COMPONENTS IN THE PIPING BETWEEN THE INDOOR AND HEAT PUMP UNITS SHALL ALSO BE INSULATED. THE INSULATION SHALL HAVE A CONTINUOUS VAPOR BARRIER AND SHALL PASS THROUGH HANGERS AND SUPPORTS UNBROKEN. ALL EXTERIOR INSULATED PIPING SHALL BE PAINTED WITH MINIMUM OF ONE (1) COAT OF UV RESISTANT PAINT. OVERSIZE HANGERS AND SUPPORTS TO ALLOW THE INSULATION TO PASS THROUGH UNBROKEN. FOLLOWING ARE THE MINIMUM INSULATION THICKNESSES UNLESS NOTED OTHERWISE IN THE MANUFACTURER'S LITERATURE OR REQUIRED BY LOCAL AHJ:

ASHRAE MOST CURRENT VERSION
PIPE SYSTEM INSULATION THICKNESS
REFRIGERANT SUCTION (40ºF & BELOW) UP TO 1 " 1/2"
1" AND UP 1"
REFRIGERANT SUCTION (41ºF TO 60°F) UP TO 1-1/2" 1/2"
1-1/2" AND UP 1" 2-1/2"
REFRIGERANT LIQUID
UP TO 1-1/2" 1"
1-1/2" AND UP 1-1/2"

CONDENSATE REMOVAL: INSTALL CONDENSATE PIPING WITH TRAP AND ROUTE FROM DRAIN PAN TO NEAREST DRAIN. DISCHARGE TO NEAREST CODE-APPROVED RECEPTOR OR TO A PROPERLY VENTED INDIRECT WASTE FITTING. FLUSH ALL PIPING BEFORE MAKING FINAL CONNECTIONS TO UNITS.

COMB ALL COILS TO REPAIR BENT FINS. INSTALL NEW FILTERS IN THE UNIT AT SUBSTANTIAL COMPLETION. A FACTORY-AUTHORIZED SERVICE AGENT SHALL ASSIST IN COMMISSIONING THE UNIT AND INSPECTING THE INSTALLATION PRIOR TO STARTUP. SUBMIT STARTUP REPORT WITH O&M MANUALS.

23 54 00 - FORCED AIR FURNACES

SECTION INCLUDES:
FORCED AIR FURNACES.
REFRIGERANT COOLING COIL AND CONDENSING UNIT.
QUALITY ASSURANCE
CONFORM TO REQUIREMENTS OF UL AND APPLICABLE CODES.
COOLING SYSTEM TESTED AND RATED PER AHRI STANDARD 210.
CONFORM TO ASHRAE 90.1.

ACCEPTABLE MANUFACTURERS:
1. BRYANT
2. CARRIER
3. LENNOX
4. TRANE
5. DAIKIN
6. RHEEM

TYPE:
PROVIDE SELF-CONTAINED, PACKAGED, FACTORY ASSEMBLED, PRE-WIRED UNIT CONSISTING OF CABINET, SUPPLY FAN, HEAT EXCHANGER, BURNER OR HEATER, CONTROLS, AIR FILTER, REFRIGERANT COOLING COIL AND OUTDOOR PACKAGE CONTAINING COMPRESSOR, CONDENSER COIL AND CONDENSER FAN.

FABRICATION:
CABINET: GALVANIZED STEEL WITH BAKED ENAMEL FINISH, EASILY REMOVED AND SECURED ACCESS DOORS, GLASS FIBER INSULATION AND REFLECTIVE LINER.
COMBUSTION CHAMBER: PRE-CAST REFRACTORY.
SUPPLY FAN: CENTRIFUGAL TYPE, RUBBER MOUNTED WITH DIRECT DRIVE, RUBBER ISOLATED 1750 RPM, 4-SPEED MOTOR.
AIR FILTERS: 1" (25 MM) THICK GLASS FIBER, DISPOSABLE TYPE ARRANGED FOR EASY REPLACEMENT.

BURNER:
PERFORMANCE: MINIMUM 95% EFFICIENCY NATURAL GAS BURNER. REFER TO MECHANICAL SCHEDULES FOR CAPACITY AND TYPE.
GAS BURNER: CONDENSING SEALED COMBUSTION TYPE, COMBUSTION GAS VALVE AND PRESSURE REGULATOR INCORPORATING MANUAL SHUTOFF, STANDING PILOT, PILOT VALVE, AUTOMATIC 100% SHUTOFF, AND THERMOCOUPLE PILOT SAFETY DEVICE. 90% MINIMUM EFFICIENCY.

OPERATING CONTROLS:
PROVIDE LOW VOLTAGE, ADJUSTABLE ROOM THERMOSTATS TO CONTROL BURNER OPERATION.
PROVIDE HIGH LIMIT CONTROL, WITH FIXED STOP AT MAXIMUM PERMISSIBLE SETTING, TO DE-ENERGIZE BURNER ON EXCESSIVE BONNET TEMPERATURE AND ENERGIZE BURNER WHEN TEMPERATURE DROPS TO LOWER SAFE VALUE.
CONTROL SUPPLY FAN BASED ON BONNET TEMPERATURE INDEPENDENT OF BURNER CONTROLS. INCLUDE MANUAL SWITCH FOR CONTINUOUS FAN OPERATION.

INSTALLATION:
MOUNT COUNTERFLOW FURNACES ON COMBUSTIBLE FLOORS, ON ADDITIVE BASE. MOUNT AIR COOLED CONDENSER PACKAGE ON CONCRETE PAD.

END OF SECTION

23 05 05 MECHANICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.

WHERE WALLS, CEILINGS, ETC., ARE SHOWN AS BEING REMOVED ON GENERAL DRAWINGS, THE CONTRACTOR SHALL REMOVE ALL MECHANICAL EQUIPMENT, DEVICES, FIXTURES, PIPING, DUCTS, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, PARTITIONS, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL REMOVE, STORE, AND REPLACE EQUIPMENT, DEVICES, FIXTURES, PIPES, DUCTS, SYSTEMS, ETC.

VERIFY THAT ABANDONED UTILITIES SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND SERVICES TO FACILITIES OR EQUIPMENT THAT SHALL REMAIN IN OPERATION FOLLOWING DEMOLITION.

COORDINATE WORK WITH ALL OTHER CONTRACTORS AND THE LANDLORD/OWNER. SCHEDULE REMOVAL OF EQUIPMENT TO AVOID CONFLICTS.

THIS CONTRACTOR SHALL VERIFY ALL EXISTING EQUIPMENT SIZES AND CAPACITIES WHERE EQUIPMENT IS SCHEDULED TO BE REPLACED OR MODIFIED, PRIOR TO ORDERING NEW EQUIPMENT.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION
DISCONNECT MECHANICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.

PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON OPERATING EQUIPMENT, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.

EXISTING HEATING SYSTEM: MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR SERVICE. DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM THE OWNER AT LEAST 48 HOURS BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MINIMIZE OUTAGE DURATION.

DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK
DEMOLISH AND EXTEND EXISTING MECHANICAL WORK UNDER PROVISIONS OF DIVISION 2 AND THIS SECTION. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION. REMOVE ABANDONED DUCTS AND PIPING TO SOURCE OF SUPPLY AND/OR MAIN LINES.

REMOVE EXPOSED ABANDONED PIPES AND DUCTS, INCLUDING ABANDONED PIPES AND DUCTS ABOVE ACCESSIBLE CEILINGS. CUT DUCTS FLUSH WITH WALLS AND FLOORS, CAP DUCT THAT REMAINS, AND PATCH SURFACES. CUT PIPES ABOVE CEILINGS, BELOW FLOORS AND BEHIND WALLS. CAP REMAINING LINES. REPAIR BUILDING CONSTRUCTION TO MATCH ORIGINAL. REMOVE ALL CLAMPS, HANGERS, SUPPORTS, ETC. ASSOCIATED WITH PIPE AND DUCT REMOVAL.

REMOVE UNUSED SECTIONS OF SUPPLY AND RETURN AIR DUCTWORK BACK TO MAINS. PATCH OPENING WITH SHEET METAL AND SEAL AIRTIGHT. PATCH EXISTING INSULATION TO MATCH EXISTING. WHERE EXISTING DUCTWORK IS TO BE CAPPED AND REUSED, LOCATE THE END CAP WITHIN 6" OF THE LAST BRANCH. END CAPS SHALL BE 3" PRESSURE CLASS AND SEAL CLASS "A".

DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED. MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS WHICH REMAIN. MODIFY INSTALLATION OR PROVIDE ACCESS PANELS AS APPROPRIATE.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.

EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING INSTALLATIONS, OR AS SPECIFIED.

PROPERLY RECLAIM AND DISPOSE OF ALL REFRIGERANT IN DEMOLISHED EQUIPMENT AND AS REQUIRED FOR EXTENSION OF EXISTING EQUIPMENT.

CUTTING AND PATCHING
THIS CONTRACTOR IS RESPONSIBLE FOR ALL PENETRATIONS OF EXISTING CONSTRUCTION REQUIRED TO COMPLETE THE WORK OF THIS PROJECT. PENETRATIONS IN EXISTING CONSTRUCTION SHOULD BE REVIEWED CAREFULLY PRIOR TO PROCEEDING WITH ANY WORK.

PENETRATIONS SHALL BE NEAT AND CLEAN WITH SMOOTH AND/OR FINISHED EDGES. CORE DRILL WHERE POSSIBLE FOR CLEAN OPENING.

REPAIR EXISTING CONSTRUCTION AS REQUIRED AFTER PENETRATION IS COMPLETE TO RESTORE TO ORIGINAL CONDITION. USE SIMILAR MATERIALS AND MATCH ADJACENT CONSTRUCTION UNLESS OTHERWISE NOTED OR AGREED TO BY THE ARCHITECT/ENGINEER PRIOR TO START OF WORK.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEANING AND REPAIR
CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED. CLEAN ALL SYSTEMS ADJACENT TO PROJECT WHICH ARE AFFECTED BY THE DUST AND DEBRIS CAUSED BY THIS CONSTRUCTION.

MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE LANDLORD/OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE LANDLORD/OWNER IN A LOCATION COORDINATED WITH THE LANDLORD/OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE LANDLORD/OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

SPECIAL REQUIREMENTS
REVIEW LOCATIONS OF ALL NEW PENETRATIONS IN EXISTING FLOOR SLABS OR WALLS. DETERMINE CONSTRUCTION TYPE AND REVIEW FOR POSSIBLE INTERFERENCES. BRING ALL CONCERNS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING.

END OF SECTION

IDAS/Ames/DOC CBC 2 AMPB
111 N SHERMAN AVE, AMES IA 50010

Horizon-Architecture

IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
REF. SCALE IN INCHES PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	GRADEG
Checked	NATJAC
Approved	Approver

SHEET TITLE
MECHANICAL SPECIFICATIONS

SCALE
Scale:

SHEET NUMBER
M501

CONDUIT INSTALLATION SCHEDULE

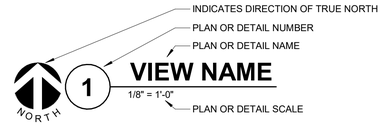
THE FOLLOWING SCHEDULE SHALL BE ADHERED TO UNLESS THEY CONSTITUTE A VIOLATION OF APPLICABLE CODES OR ARE NOTED OTHERWISE ON THE DRAWINGS. THE INSTALLATION OF RMC CONDUIT WILL BE PERMITTED IN PLACE OF ALL CONDUIT SPECIFIED IN THIS SCHEDULE. REFER TO CONDUIT AND BOXES SPECIFICATION 26 05 33 FOR ADDITIONAL INFORMATION.

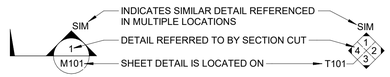
INSTALLATION TYPE	RMC	EMT	ASR
FEEDERS: SWITCHBOARDS, DISTRIBUTION PANELS, PANELBOARDS, MOTOR CONTROL CENTERS, ETC.		X	
BRANCH CIRCUITS: LIGHTING, RECEPTACLES, CONTROLS, ETC.		X	
MECHANICAL EQUIPMENT FEEDERS: PUMPS, CHILLERS, AIR HANDLING UNITS, ETC.		X	
FLOOR MOUNTED EQUIPMENT FEEDERS: PUMPS, ETC. (INCLUDE NO MORE THAN 6 FEET OF LFMC TO PUMP)		X	
CONTROLS (LIGHTING, POWER, BUILDING AUTOMATION, ETC.)		X	
WET AND DAMP LOCATIONS: (CONDUIT, BOXES, FITTINGS, INSTALLED AND EQUIPPED TO PREVENT WATER ENTRY)	X		
ELEVATED CONCRETE SLABS (ABOVE GRADE)	X		
INTERIOR LOCATIONS WITH FINISHED CEILING AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS		X	
INTERIOR LOCATIONS WITHOUT FINISHED CEILINGS: CONCEALED IN WALL, EXPOSED ABOVE CEILINGS		X	
EXISTING INTERIOR LOCATIONS WITH FINISHED CEILINGS AND WALLS: CONCEALED IN WALLS AND ABOVE FINISHED CEILING UNLESS OTHERWISE NOTED		X	X

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
———— NEW
- - - - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

EXISTING TO REMAIN OR WORK BY OTHERS (NARROW LINE)
———— EXISTING
- - - - - - - - EXISTING TO BE REMOVED BY OTHERS (SHORT DASHED PATTERN)
— — — — EXISTING UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 2015 EDITION
PLUMBING CODE:	UPC 2021 EDITION
MECHANICAL CODE:	IMC 2021 EDITION
ELECTRICAL CODE:	NFPA 70 (NEC) 2020 EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

CONTACT PERSONS:

DESCRIPTION:	PERSON:
PROJECT MANAGER	PARKER POLASCHEK
MECHANICAL	GRADY DEGENEFFE
ELECTRICAL	ZACH ROSS

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
V.C.	VENTILATION CONTRACTOR

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
E / E	ECONN	26 05 33	ELECTRICAL CONNECTION
▭	PANEL '###'	--	PANELBOARD - SURFACE MOUNT
▭ ◪	MX-#	26 24 19	SURFACE MOUNTED MANUAL SWITCH. REFER TO DISC/STA SCHEDULE.
⇒	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
⇒	REC-DUP-GFI	26 27 26	DUPLEX GFI RECEPTACLE, 125V
⇒	REC-SIM-1430R	26 27 26	RECEPTACLE, 14-30R, 125/250V

ELECTRICAL SYMBOL LIST

SYMBOL:	SPEC TAG:	SPEC SECTION:	DESCRIPTION:
S ##	SW-O	26 09 33	SWITCH SUBSCRIPTS: O = DUAL TECHNOLOGY OCCUPANCY SENSOR WITH WALL SWITCH
OC ##	SW-OC-A	26 09 33	OCCUPANCY SENSOR - CEILING MOUNTED SUBSCRIPTS: A = ULTRASONIC - TWO SIDED CORRIDOR COVERAGE

RECEPTACLE SUBSCRIPT KEY:

DEVICE KEY:

DEVICE — # = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A — MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH

LUMINAIRE CIRCUIT AND CONTROL KEY

LUMINAIRE

F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
a = SWITCH DESIGNATION

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

ELECTRICAL ABBREVIATION KEY

ABBR:	DESCRIPTION:
ABV	ABOVE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ASR	ARCHITECTURAL SURFACE RACEWAY
BC	BELOW COUNTER
C	CONDUIT (BRANCH CIRCUIT OR FEEDER CONTEXT)
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUNDING CONDUCTOR
NC	NORMALLY CLOSED
NEMA #	NEMA RATING
NIC	NOT IN CONTRACTED SCOPE
NO	NORMALLY OPEN
ROOF	EQUIPMENT LOCATED ON ROOF ABOVE
SM	SURFACE MOUNTED
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
3. ELECTRICAL CONTRACTOR SHALL REVIEW EXISTING CONDITIONS TO VERIFY ACCESSIBILITY TO THE AREAS OF THEIR WORK INCLUDING WALLS, FLOOR, CEILINGS, CEILING TILES/GRID, AND ROOF. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE CUTTING, REMOVAL, PATCHING, AND REINSTALLATION OF AFFECTED AREAS ASSOCIATED WITH THEIR WORK BY COORDINATING WITH THE GENERAL CONTRACTOR OR QUALIFIED CONTRACTOR.
4. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.

ELECTRICAL INSTALLATION NOTES:

1. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.
2. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED. MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
3. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS.
4. CONNECTION FOR ELECTRIC WATER COOLERS (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.
5. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS,CARBON MONOXIDE DETECTORS, AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE. CARBON MONOXIDE DETECTORS SHALL BE LOCATED 10 PLUS FT FROM FIRE PLACES, COOKING, AND SIMILAR FUEL-BURNING APPLIANCES.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
7. CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
8. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
9. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL SHEET INDEX

IDAS/Ames/DOC CBC 2 AMPB
111 N SHERMAN AVE, AMES IA 50010

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IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

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KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
REF. SCALE IN INCHES

PROJECT #24003771.00

REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue: 100% CD
Date: 9/6/2024
Project #: 24003771.00
Drawn: ZACROS
Checked: KRISPI
Approved: KRISPI

SHEET TITLE

ELECTRICAL COVERSHEET

SCALE

Scale: As indicated

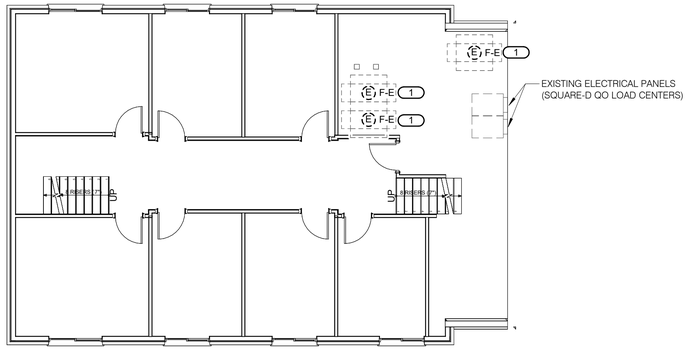
SHEET NUMBER

E000

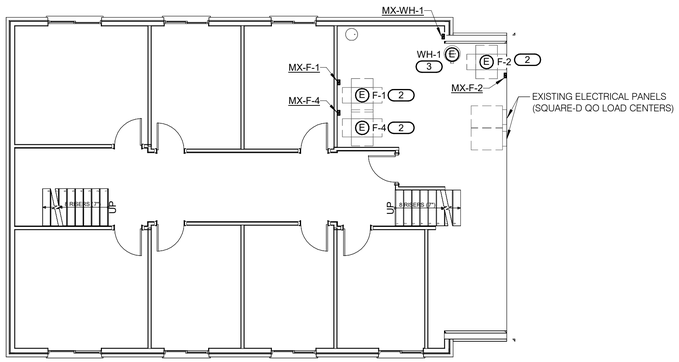
IDAS/Ames/DOC CBC 2 AMPB 9/6/2024 9:06:17 AM 24003771.00

KEYNOTES: (#)

1. DISCONNECT EXISTING FURNACE. EXISTING CONDUIT AND CONDUCTORS SHALL REMAIN IN PLACE FOR INSTALLATION OF NEW FURNACE.
2. CONNECT NEW FURNACE TO EXISTING CIRCUIT SERVING PREVIOUSLY REMOVED UNIT. EXTEND EXISTING CONDUIT AND CONDUCTORS AS NECESSARY.
3. CONNECT TO NEW 20A/1P CIRCUIT BREAKER IN EXISTING ELECTRICAL PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.



NORTH 1 **BASEMENT DEMOLITION PLAN - ELECTRICAL**
1/8" = 1'-0"



NORTH 2 **BASEMENT PLAN - ELECTRICAL**
1/8" = 1'-0"

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9/6/2024 9:06:18 AM
24003771.00

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The FUTURE. Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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SHEET INFORMATION

Issue	100% CD
Date	9/6/2024
Project #	24003771.00
Drawn	ZACROS
Checked	KRISPI
Approved	KRISPI

SHEET TITLE
BASEMENT PLAN - ELECTRICAL

SCALE
Scale: 1/8" = 1'-0"

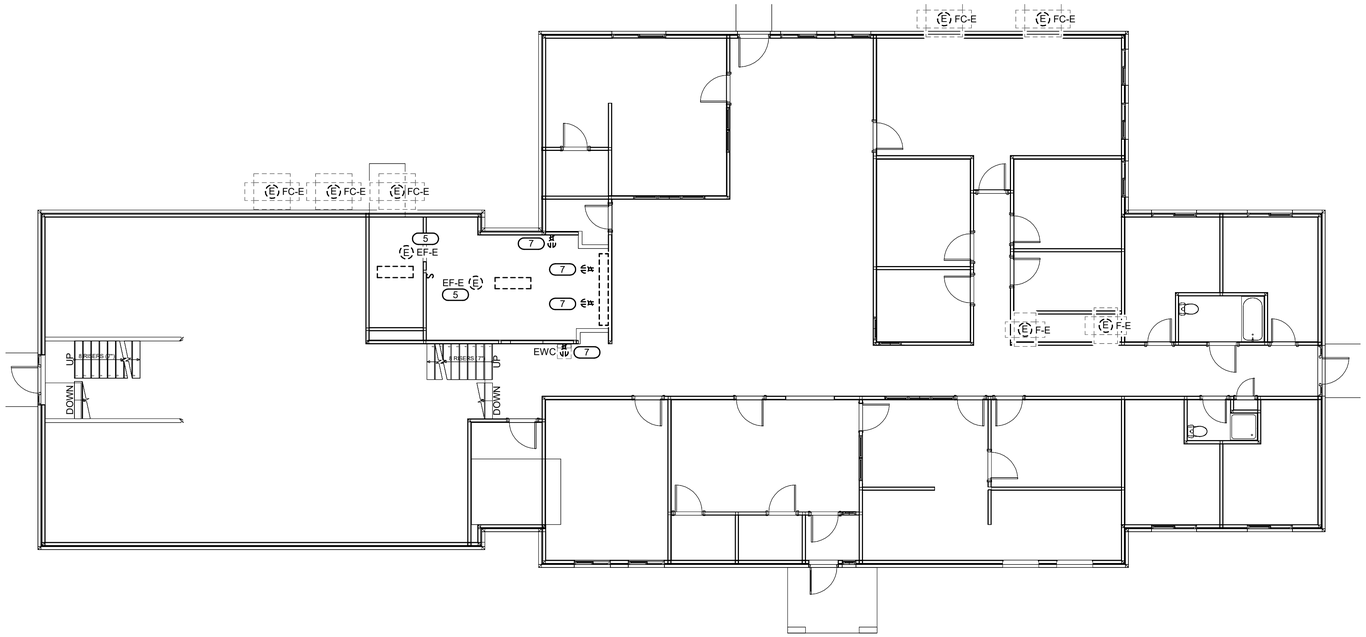
SHEET NUMBER
E200

SHEET NOTES:

1. CONNECT LIGHTS TO EXISTING LIGHTING CIRCUIT SERVING THE AREA. EXTEND USING 2# 12 & 1#12 EGC IN 3/4" C.
2. EXISTING ELECTRICAL PANEL LOCATED IN BASEMENT. REFER TO E200 FOR LOCATION.

KEYNOTES: (#)

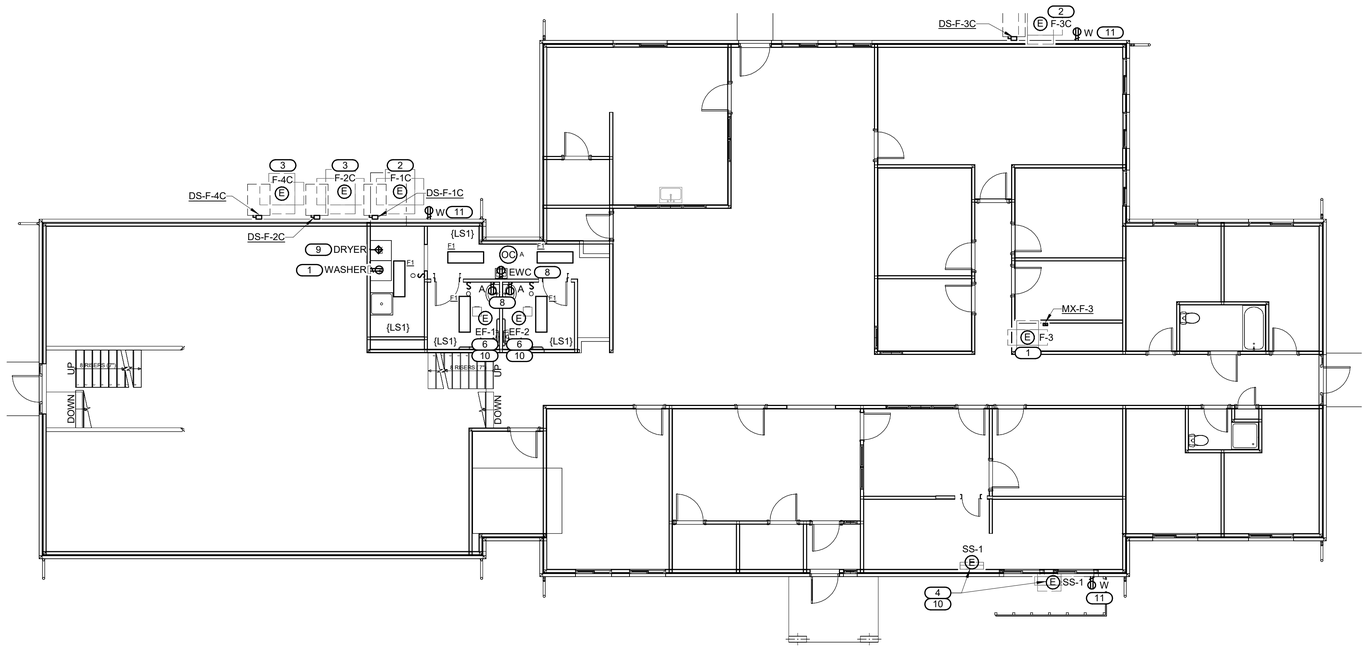
1. CONNECT TO NEW 20A/1P CIRCUIT BREAKER IN EXISTING ELECTRICAL PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.
2. CONNECT TO NEW 50A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#8 & 1#10 EGC IN 3/4" C. UTILIZE EXISTING SPACE IN PANEL PREVIOUSLY SERVING A/C UNITS.
3. CONNECT TO NEW 40A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#8 & 1#10 EGC IN 3/4" C. UTILIZE EXISTING SPACE IN PANEL PREVIOUSLY SERVING A/C UNITS.
4. CONNECT INDOOR AND OUTDOOR UNIT OF SPLIT SYSTEM TO A NEW 15A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#12 & 1# 12 EGC IN 3/4" C.
5. DISCONNECT EXISTING EXHUAST FAN. CONDUIT AND CONDUCTORS TO REMAIN IN PLACE FOR INSTALLATION OF NEW EXHAUST FAN.
6. CONNECT EXHAUST FAN TO EXISTING CIRCUIT SERVING EXHAUST FANS. EXTEND EXISTING CONDUIT AND CONDUCTORS AS NECESSARY TO NEW LOCATION.
7. DEMOLISH CONDUIT AND CONDUCTORS TO JUNCTION BOX ABOVE CEILING. EXISTING CIRCUIT TO BE EXTENDED TO NEW RECEPTACLES.
8. EXTEND EXISTING RECEPTACLE CIRCUIT FROM JUNCTION BOX ABOVE CEILING TO NEW DEVICE USING 2#12 & 1#12 EGC IN 3/4" C.
9. CONNECT TO NEW 30A/2P CIRCUIT BREAKER IN EXISTING PANEL USING 2#10 & 1#10 EGC IN 3/4" C.
10. DISCONNECT/CONTROLLER TO BE PROVIDED BY MANUFACTURER, INSTALLED BY EC.
11. CONNECT TO NEAREST 120V RECEPTACLE CIRCUIT USING 2#12 & 1#12 EGC IN 3/4" C.



NORTH

1 LEVEL 01 DEMOLITION PLAN - ELECTRICAL

1/8" = 1'-0"



NORTH

2 LEVEL 01 PLAN - ELECTRICAL

1/8" = 1'-0"

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2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

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Approved	KRISPI

SHEET TITLE

LEVEL 01 PLAN - ELECTRICAL

SCALE

Scale: 1/8" = 1'-0"

SHEET NUMBER

E201

24003771.00 9/6/2024 9:06:21 AM IDAS/Ames/DOC CBC 2 AMPB

LED LUMINAIRE SCHEDULE

(DESC) DOOR:	**DISTRIBUTION:**	**BEAMWIDTH:**	**(L/L) LENS/LOUVER:**	K19 - KSH19 .156" ACRYLIC
FA - FLAT ALUMINUM	II - ANSI/IES TYPE 2 DISTRIBUTION	NSP - VERY NARROW SPOT	A - .125" ACRYLIC	M - MATTE DIFFUSE CLEAR
FS - FLAT STEEL	III - ANSI/IES TYPE 3 DISTRIBUTION	SP - SPOT	B - BAFFLE/LOUVER	N - NONE
RA - REGRESSED ALUMINUM	IV - ANSI/IES TYPE 4 DISTRIBUTION	MD - MEDIUM	C - CLEAR ALZAK	P - POLYCARBONATE
RS - REGRESSED STEEL	V - ANSI/IES TYPE 5 DISTRIBUTION	WD - WIDE	F - FROSTED ACRYLIC	R - HIGH IMPACT DR ACRYLIC
FINISH:		VWD - VERY WIDE	G - TEMPERED GLASS	SS - SEMI-SPECULAR CLEAR
PAF - PAINT AFTER FABRICATION		WW - WALL WASH	K - KSH12 .125" ACRYLIC	O - OTHER (SEE DESCRIPTION)
CFSA - COLOR-FINISH SELECTION BY ARCHITECT				[DESIGN SPECIFIC BLANKS]
(MTG) MOUNTING:	RE - RECESSED		**(WATT) PER:**	FIX - FIXTURE, FT - FOOT, LAMP
CL - CEILING SURFACE	SP - SUSPENDED		**(TYPE) LED**	RGB - COLOR CHANGING LED
CV - COVE	SU - SURFACE		LED - LIGHT EMITTING DIODE	RGBW - COLOR CHANGING + WHITE
FR - FLANGED RECESSED	UC - UNDER CABINET		TLED - TUBULAR LED LAMP	RGBA - COLOR CHANGING + AMBER
P - PERIMETER	WL - WALL		OLED - ORGANIC LED	RLED - RETROFIT LED
PL - POLE	O - OTHER (SEE DESCRIPTION)		DLED - DYNAMIC TUNABLE LED	WLED - WARM DIM LED
(TYPE) DRIVER:				
0-10V - 0-10V DIMMING	EB - ELECTRONIC	HL - HIGH/LOW (100%/50%) STEP DIM		MV - MULTI-VOLTAGE ELECTRONIC
DALI - DIGITAL ADDRESSABLE	ELV - ELECTRONIC LOW VOLTAGE	LINE - LINE VOLTAGE DIMMING		REM - REMOTE
DMX - DIGITAL MULTIPLEX	EM - EMERGENCY BATTERY	ML - MULTI-LEVEL SWITCHING		O - OTHER (SEE DESCRIPTION)

CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.

VERIFY AND COORDINATE ALL CEILING TYPES WITH LUMINAIRE MOUNTING AND TRIM REQUIREMENTS PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT AND INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
UNLESS INDICATED ON LIGHTING PLANS OR BELOW, REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

REFER TO SPECIFICATION SECTIONS LED LIGHTING 26 51 19 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
INTERIOR CORRELATED COLOR TEMPERATURE 4000K, COLOR RENDERING INDEX (CRI) AT OR ABOVE 80, UNLESS NOTED OTHERWISE.

				DIMENSIONS				WATT		LED			DRIVER		
ITEM	DESCRIPTION	L/L	MTG	L	W	H	DIA.	ANSI WATTS	PER	TYPE	QTY	DELIVERED LUMENS (MIN)	VOLTS	TYPE	MANUFACTURER AND MODEL
F1	WRAPAROUND, LOW PROFILE, STEEL HOUSING AND END PLATES, FROSTED PRISMATIC ACRYLIC DIFFUSER.	O	SU	4'-0"	1'-3"	3"		22 W	FIX	LED	1	2700	120 V	0-10V	ACUITY LITHONIA LBL CURRENT COLUMBIA LAW SIGNIFY DAYBRITE OWL LED COOPER METALUX WSNLED

LIGHTING SEQUENCE OF OPERATION

NOTES:
1. {L##} DENOTES THE LIGHTING SEQUENCE OF OPERATIONS FOR THIS SPACE.

PLAN ID	LIGHTING SWITCHED
{LS1}	Sequence: Switched lights are controlled in this space. ON: The lights are turn on by occupancy sensor. OFF: After the space has been vacant for 15 minutes, the lights will automatically turn off.

DISCONNECT AND STARTER SCHEDULE

NOTE: ALL DISCONNECTS (EXCEPT MANUAL STARTERS) SHALL BE HEAVY DUTY TYPE.

DISCONNECT TYPE:	**ACCESSORIES & OPTIONS**	
FU - FUSED	SA - STANDARD ACCESSORIES (INCLUDES * ITEMS)	PF - PHASE LOSS PROTECTION (5 HP OR GREATER, 3 PHASE MOTOR)
NF - NON-FUSED	*CT - CONTROL TRANSFORMER, FUSED 120V	TO - MELTING THERMAL OVERLOADS (1 PHASE)
CB - CIRCUIT BREAKER	*EO - ELECTRONIC OVERLOAD (3 PHASE MOTORS)	TS - 2 SPEED SELECTOR SWITCH IN DOOR
	*HA - HAND-OFF-AUTO IN DOOR	GP - GREEN (OFF) PILOT LIGHT IN DOOR
STARTER TYPE:	*RP - RED (RUN) PILOT LIGHT IN DOOR	FA - 4-CONVERTIBLE AUXILIARY CONTACTS
FV - FULL VOLTAGE	*TA - TWO CONVERTIBLE AUXILIARY CONTACTS	EI - ELECTRICAL INTERLOCK (2)-N.O. & (2)-N.C.
YD - WYE - DELTA	S/N - INSULATED NEUTRAL ASSEMBLY	SS - START-STOP PUSHBUTTON IN DOOR
RE - REVERSING		HL - HANDLE PADLOCK HASP
TW - 2 SPEED, 2 WINDING		
SW - 2 SPEED, 1 WINDING		
RV - REDUCED VOLTAGE AUTOXFMR		
SS - SOLID STATE		
MS - MANUAL STARTER		
MX - MANUAL SWITCH		
FS - FUSED SWITCH		
AMS-ASSEMBLED MOTOR STARTER		

	DISCONNECT TYPE & RATING					STARTER				
ITEM	TYPE	RATING	TRIP RATING	VOLTAGE	POLES	NEMA SIZE	TYPE	ENCLOSURE	REQUIRED ACCESSORIES & OPTIONS	APPROVED MANUFACTURERS
MX-WH-1		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-1		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-4		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-2		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
MX-F-3		30 A		120 V	1	0	MX	NEMA 1		SQUARE D 2510 KG1 EATON TYPE B2 GENERAL ELECTRIC TYPE TC SIEMENS TYPE MMS
DS-F-3C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-4C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-2C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF
DS-F-1C	NF	60 A		208 V	3			NEMA 3R		SQUARE D 3110 H322RB EATON TYPE DH GENERAL ELECTRIC TYPE TH SIEMENS TYPE HF

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111 N SHERMAN AVE, AMES IA 50010

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IMEG
The FUTURE Built Smarter www.imegcorp.com
2882 106TH STREET
DES MOINES, IA 50322
P: 515.334.9906 F: 515.334.9908

PROFESSIONAL SEAL

CONSULTANT

KEY PLAN

AGENCY APPROVAL

DISCLAIMER

0 1 2 3
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REVISIONS

No.	Date	Revision / Issue

SHEET INFORMATION

Issue	**100% CD**
Date	**9/6/2024**
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Drawn	**ZACROS**
Checked	**KRISPI**
Approved	**KRISPI**

SHEET TITLE

ELECTRICAL SCHEDULES

SCALE

Scale:

SHEET NUMBER

E600

24003771.00 9/6/2024 9:06:21 AM IDAS/Ames/DOC CBC 2 AMPB

26 05 00 BASIC ELECTRICAL REQUIREMENTS

SCOPE OF WORK

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NEW MATERIALS AS INDICATED ON THE DRAWINGS, AND/OR IN THESE SPECIFICATIONS, AND ALL ITEMS REQUIRED TO MAKE ASSOCIATED PORTION OF THE ELECTRICAL WORK A FINISHED AND WORKING SYSTEM.

TEMPERATURE CONTROL WIRING FOR PLUMBING AND HVAC EQUIPMENT WILL BE BY OTHER CONTRACTORS.

CODES AND STANDARDS

CONFORM TO ALL REQUIREMENTS OF THE CITY OF AMES, IOWA CODES, LAWS, ORDINANCES, AND OTHER REGULATIONS HAVING JURISDICTION OVER THIS INSTALLATION.

IF THE CONTRACTOR NOTES, AT THE TIME OF BIDDING, THAT ANY PARTS OF THE DRAWINGS OR SPECIFICATIONS DO NOT COMPLY WITH THE CODES OR REGULATIONS, CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER IN WRITING, REQUESTING A CLARIFICATION.

PERMITS AND FEES

PROCURE ALL APPLICABLE PERMITS AND LICENSES. ABIDE BY LOCAL AND STATE LAWS, REGULATIONS, AND ORDINANCES. PAY ALL CHARGES FOR PERMITS OR LICENSES. PAY ALL FEES AND TAXES IMPOSED BY STATE, MUNICIPAL, AND OTHER REGULATORY BODIES. PAY ALL CHARGES ARISING OUT OF REQUIRED INSPECTIONS BY AN AUTHORIZED BODY. PAY ALL CHARGES ARISING OUT OF REQUIRED CONTRACT DOCUMENT REVIEWS ASSOCIATED WITH THE PROJECT AND AS INITIATED BY THE OWNER OR AUTHORIZED AGENCY/CONSULTANT.

WHERE APPLICABLE, ALL FIXTURES, EQUIPMENT AND MATERIALS SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC. OR A NATIONALLY RECOGNIZED TESTING ORGANIZATION.

DRAWINGS

THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF THE WORK AND TO INDICATE THE GENERAL ARRANGEMENTS AND LOCATIONS OF EQUIPMENT, OUTLETS, ETC., AND THE APPROXIMATE SIZES OF EQUIPMENT.

CONTRACTOR SHALL DETERMINE THE EXACT LOCATIONS OF EQUIPMENT AND ROUGH-INS, AND THE EXACT ROUTING OF RACEWAYS SO AS TO BEST FIT THE LAYOUT OF THE JOB. CONDUIT ENTRY POINTS FOR ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, PANELBOARDS, SWITCHBOARDS, SWITCHGEAR AND UNIT SUBSTATIONS, SHALL BE DETERMINED BY THE CONTRACTOR UNLESS NOTED IN THE CONTRACT DOCUMENTS.

CONSTRUCTION DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED UTILIZING REVIT. CONTRACTORS AND SUBCONTRACTORS MAY REQUEST ELECTRONIC MEDIA FILES OF THE CONTRACT DRAWINGS. THE ELECTRONIC CONTRACT DOCUMENTS CAN BE USED FOR PREPARATION OF SHOP DRAWINGS AND AS-BUILT DRAWINGS ONLY. THE INFORMATION MAY NOT BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT.

VERIFY ALL PERTINENT DIMENSIONS AT THE JOB SITE BEFORE ORDERING ANY CONDUIT, CONDUCTORS, WIREWAYS, BUS DUCT, FITTINGS, ETC.

SUBMITTALS

SUBMITTALS SHALL BE REQUIRED WHERE REQUIRED IN THE SPECIFICATIONS OR ON THE DRAWINGS. THE CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF EACH SHOP DRAWING FOR REVIEW BY THE ARCHITECT/ENGINEER BEFORE RELEASING ANY EQUIPMENT FOR MANUFACTURE OR SHIPMENT.

THE CONTRACTOR SHALL THOROUGHLY REVIEW AND APPROVE ALL SHOP DRAWINGS BEFORE SUBMITTING THEM TO THE ARCHITECT/ENGINEER. CONTRACTOR SHALL CLEARLY MARK ALL DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS. ASSEMBLE ALL SUBMITTALS IN SETS, SUCH AS PANELBOARDS, FIRE ALARM, LIGHTING, OR MOTOR CONTROL. ALL SETS SHALL BE IDENTICAL AND CONTAIN AN INDEX OF THE ITEMS ENCLOSED WITH A GENERAL TOPIC DESCRIPTION ON THE COVER. WHERE MORE THAN ONE MODEL IS SHOWN ON A MANUFACTURER'S SHEET, CLEARLY INDICATE EXACTLY WHICH ITEM AND WHICH DATA IS RELEVANT TO THE WORK. REFER TO SUBSECTIONS FOR SPECIFIC SUBMITTAL REQUIREMENTS.

WARRANTY

PROVIDE MINIMUM ONE-YEAR WARRANTY FOR ALL FIXTURES, EQUIPMENT, MATERIALS, AND WORKMANSHIP. REFER TO SUBSECTIONS FOR ADDITIONAL WARRANTY REQUIREMENTS.

MATERIAL SUBSTITUTION

WHERE SEVERAL MANUFACTURERS' NAMES ARE GIVEN, THE MANUFACTURER FOR WHICH A CATALOG NUMBER IS GIVEN IS THE BASIS OF DESIGN AND ESTABLISHES THE QUALITY REQUIRED. EQUIVALENT EQUIPMENT MANUFACTURED BY THE OTHER NAMED MANUFACTURERS MAY BE USED. CONTRACTOR SHALL ENSURE THAT ALL ITEMS SUBMITTED BY THESE OTHER MANUFACTURERS MEET ALL REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND FIT IN THE ALLOCATED SPACE. THE ARCHITECT/ENGINEER SHALL MAKE THE FINAL DETERMINATION OF WHETHER A PRODUCT IS EQUIVALENT.

ANY MATERIAL, ARTICLE, OR EQUIPMENT OF OTHER UNNAMED MANUFACTURERS WHICH WILL ADEQUATELY PERFORM THE SERVICES AND DUTIES IMPOSED BY THE DESIGN AND IS OF A QUALITY EQUAL TO OR BETTER THAN THE EQUIPMENT IDENTIFIED BY THE DRAWINGS MAY BE USED IF APPROVAL IS SECURED IN WRITING FROM THE ARCHITECT/ENGINEER VIA ADDENDUM.

PROJECT CLOSEOUT

SUBMIT THE FOLLOWING: OPERATION AND MAINTENANCE MANUALS INCLUDING BOUND COPIES OF APPROVED SHOP DRAWINGS, RECORD DOCUMENTS, SPARE PARTS AND EXTRA MATERIALS IN QUANTITIES SPECIFIED IN THESE SPECIFICATIONS, INSPECTION AND TESTING REPORT BY THE FIRE ALARM SYSTEM MANUFACTURER.

PROVIDE CUSTOM UPDATED/NEW TYPED CIRCUIT DIRECTORY FOR EACH EXISTING/NEW BRANCH CIRCUIT PANELBOARD INCLUDED IN THE SCOPE OF WORK. LABEL SHALL INCLUDED EQUIPMENT NAME OR FINAL APPROVED ROOM NAME, ROOM NUMBER, AND LOAD TYPE FOR EACH CIRCUIT (EXAMPLES: SUMP PUMP SP-1 OR ROOM 101 RECEPT). PRINTED COPIES OF THE BID DOCUMENT PANEL SCHEDULES ARE NOT ACCEPTABLE AS CIRCUIT DIRECTORIES.

RECORD DOCUMENTS

MAINTAIN AT THE JOB SITE A SEPARATE AND COMPLETE SET OF ELECTRICAL DRAWINGS AND SPECIFICATIONS WITH ALL CHANGES MADE TO THE SYSTEMS CLEARLY AND PERMANENTLY MARKED IN COMPLETE DETAIL. MARK DRAWINGS TO INDICATE APPROVED SUBSTITUTIONS, CHANGE ORDERS, AND ACTUAL EQUIPMENT AND MATERIALS USED. ALL CHANGE ORDERS, RFI RESPONSES, CLARIFICATIONS, AND OTHER SUPPLEMENTAL INSTRUCTIONS SHALL BE MARKED ON THE DOCUMENTS. RECORD DOCUMENTS THAT MERELY REFERENCE THE EXISTENCE OF THE ABOVE ITEMS ARE NOT ACCEPTABLE. RECORD CHANGES DAILY AND KEEP THE MARKED DRAWINGS AVAILABLE FOR THE ARCHITECT/ENGINEER'S EXAMINATION AT ANY NORMAL WORK TIME.

UPON COMPLETING THE JOB AND BEFORE FINAL PAYMENT IS MADE, PROVIDE REPRODUCIBLE DRAWINGS COMPLETED IN AUTOCAD TO THE ARCHITECT/ENGINEER.

CLEANING

THOROUGHLY CLEAN ALL EQUIPMENT AND SYSTEMS PRIOR TO THE OWNER'S FINAL ACCEPTANCE OF THE PROJECT. CLEAN ALL FOREIGN PAINT, GREASE, OIL, DIRT, LABELS, STICKERS, ETC. FROM ALL EQUIPMENT. REMOVE ALL RUBBISH, DEBRIS, ETC., ACCUMULATED DURING CONSTRUCTION FROM THE PREMISES.

26 05 05 ELECTRICAL DEMOLITION FOR REMODELING

THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND DO NOT INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.

WHERE WALLS, CEILINGS, STRUCTURES, ETC., ARE INDICATED AS BEING REMOVED ON GENERAL OR ELECTRICAL DRAWINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL ELECTRICAL EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC., FROM THE REMOVED AREA.

WHERE CEILINGS, WALLS, STRUCTURES, ETC., ARE TEMPORARILY REMOVED AND REPLACED BY OTHERS, THIS CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL, STORAGE, AND REPLACEMENT OF EQUIPMENT, DEVICES, FIXTURES, RACEWAYS, WIRING, SYSTEMS, ETC.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING EQUIPMENT REMOVED BY OTHER TRADES AND REMOVING ALL ASSOCIATED STARTERS, CONTROLLERS, RACEWAYS, WIRING, ETC.

VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED EQUIPMENT OR FACILITIES. EXTEND CONDUIT AND WIRE TO FACILITIES AND EQUIPMENT THAT WILL REMAIN IN OPERATION FOLLOWING DEMOLITION. EXTENSION OF CONDUIT AND WIRE TO EQUIPMENT SHALL BE COMPATIBLE WITH THE SURROUNDING AREA. EXTENDED CONDUIT AND CONDUCTORS SHALL MATCH EXISTING SIZE AND MATERIAL.

COORDINATE SCOPE OF WORK WITH ALL OTHER CONTRACTORS AND THE OWNER AT THE PROJECT SITE. SCHEDULE REMOVAL OF EQUIPMENT AND ELECTRICAL SERVICE TO AVOID CONFLICTS.

BID SUBMITTAL SHALL MEAN THE CONTRACTOR HAS VISITED THE PROJECT SITE AND HAS VERIFIED EXISTING CONDITIONS AND SCOPE OF WORK.

PREPARATION

PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS. ASSUME ALL EQUIPMENT AND SYSTEMS MUST REMAIN OPERATIONAL UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

REMOVE ABANDONED WIRING AND RACEWAY TO SOURCE OF SUPPLY. EXISTING CONDUIT IN GOOD CONDITION MAY BE REUSED IN PLACE BY INCLUDING AN EQUIPMENT GROUND CONDUCTOR IN REUSED CONDUIT. REUSED CONDUIT AND BOXES SHALL HAVE SUPPORTS REVISED TO MEET CURRENT CODES. RELOCATING CONDUIT SHALL NOT BE ALLOWED.

REMOVE EXPOSED ABANDONED RACEWAY, INCLUDING ABANDONED RACEWAY ABOVE ACCESSIBLE CEILING FINISHES. CUT EMBEDDED RACEWAY FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES. REMOVE ALL ASSOCIATED CLAMPS, HANGERS, SUPPORTS, ETC.

DISCONNECT AND REMOVE OUTLETS AND DEVICES THAT ARE TO BE DEMOLISHED. REMOVE CONDUIT, SUPPORTS, AND CONDUCTORS BACK TO SOURCE. BACK BOX AND CONDUIT MOUNTED IN WALLS THAT ARE TO REMAIN CAN BE ABANDONED IN PLACE. PROVIDE APPROPRIATE COVER PLATE FOR ALL ABANDONED BACK BOXES PER WIRING DEVICES SPECIFICATION.

DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. BALLASTS IN LIGHT FIXTURES INSTALLED PRIOR TO 1980 SHALL BE INCINERATED IN EPA-APPROVED INCINERATOR OR DISPOSED OF IN EPA-CERTIFIED CONTAINERS AND DEPOSITED IN AN EPA LANDFILL CERTIFIED FOR PCB DISPOSAL OR RECYCLED BY PERMITTED BALLAST RECYCLER.

HID AND FLUORESCENT LAMPS DETERMINED BY THE TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP) TO BE HAZARDOUS WASTE SHALL BE DISPOSED OF IN AN EPA-PERMITTED HAZARDOUS WASTE DISPOSAL FACILITY OR BY A PERMITTED LAMP RECYCLER.

REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PATCH OPENINGS TO MATCH EXISTING SURROUNDING FINISHES. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS THAT REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE JUNCTION BOXES AND ACCESS PANEL AS APPROPRIATE. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS.

FLOOR SLABS MAY CONTAIN CONDUIT SYSTEMS. THIS CONTRACTOR IS RESPONSIBLE FOR TAKING ANY MEASURES REQUIRED TO ENSURE NO CONDUITS OR OTHER SERVICES ARE DAMAGED. THIS INCLUDES X-RAY OR SIMILAR NON-DESTRUCTIVE MEANS. WHERE CONDUIT IS IN CONCRETE SLAB, CUT CONDUIT FLUSH WITH FLOOR, PULL OUT CONDUCTORS, AND PLUG CONDUIT ENDS.

THIS CONTRACTOR IS RESPONSIBLE FOR ALL COSTS INCURRED IN REPAIR, RELOCATIONS, OR REPLACEMENT OF ANY CABLES, CONDUITS, OR OTHER SERVICES IF DAMAGED WITHOUT PROPER INVESTIGATION.

CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT THAT REMAIN OR ARE TO BE REUSED.

ELECTRICAL ITEMS REMOVED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER ABANDONS.

26 05 13 WIRE AND CABLE

FEEDERS AND BRANCH CIRCUITS 8 AWG AND LARGER SHALL BE COPPER, STRANDED, 600 VOLT INSULATION, THHN.

FEEDERS AND BRANCH CIRCUITS 10 AWG AND SMALLER; COPPER, SOLID OR STRANDED, 600 VOLT INSULATION, THHN/THWN. NOTED ON THE DRAWINGS. MINIMUM SIZE #12 AWG.

METAL CLAD CABLE (MC) SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH UL STANDARD FOR TYPE MC CABLES, UL 4, EXTERIOR OF METAL INTERLOCKED ARMOR.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DERATING AND SIZING CONDUCTORS AND CONDUITS TO EQUAL OR EXCEED THE AMPACITY OF NEC TABLE B.310.15(B)(2)(7), IF METHODS OR MATERIALS OTHER THAN THE BASIS OF DESIGN ARE USED.

USE # 10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 75 FEET.

ALL WIRES IN OUTLET BOXES NOT CONNECTED TO FIXTURES OR OTHER DEVICES SHALL BE ROLLED UP, SPLICED IF CONTINUITY OF CIRCUIT IS REQUIRED, AND INSULATED.

OPEN CABLE SHALL BE SUPPORTED BY THE APPROPRIATE SIZE BRIDLE RINGS OR OTHER MEANS IF CALLED FOR ON THE DRAWINGS. WIRE AND CABLE FROM DIFFERENT SYSTEMS SHALL NOT BE INSTALLED IN THE SAME BRIDLE RINGS. BRIDLE RING SUPPORTS SHALL BE INSTALLED AT A MINIMUM OF FIVE FOOT (5') INTERVALS.

OPEN CABLE INSTALLED ABOVE SUSPENDED CEILINGS SHALL NOT REST ON THE SUSPENDED CEILING CONSTRUCTION, NOR UTILIZE THE CEILING SUPPORT SYSTEM FOR WIRE AND CABLE SUPPORT. SPLICE AND TAP ONLY IN ACCESSIBLE JUNCTION BOXES.

USE SOLDERLESS, TIN-PLATED COPPER LUGS APPLIED WITH CIRCUMFERENTIAL CRIMP FOR COPPER TERMINATIONS #8 AWG AND LARGER. USE INDENTER CRIMP #10 AWG AND SMALLER.

AC/MC CABLE SHALL BE SUPPORTED BY AN APPROVED MEANS EVERY 4.5' AND WITHIN 12" OF OUTLET BOXES, JUNCTION BOXES, CABINETS, OR FITTINGS.

TEST WIRE AND CABLE INSULATION WITH DEVICE SUCH AS A "MEGGER", USING NOT LESS THAN 500 VOLTS D.C. TEST POTENTIAL.

26 05 26 GROUNDING AND BONDING

COMPLY WITH UL 467 GROUNDING AND BONDING EQUIPMENT.

CONDUCTORS SHALL BE COPPER IN ACCORDANCE WITH 26 05 13.

CONNECTORS SHALL BE HYDRAULIC COMPRESSION TYPE.

EQUIPMENT GROUNDING

INSTALL EQUIPMENT GROUNDING CONDUCTORS IN ALL FEEDERS AND CIRCUITS.

EQUIPMENT GROUNDING CONDUCTORS: INSULATED WITH GREEN-COLORED INSULATION.

FIELD QUALITY CONTROL

PROVIDE GROUND TESTING IN ACCORDANCE WITH IEEE STANDARDS.

26 05 27 SUPPORTING DEVICES

APPROVED MANUFACTURERS: ALLIED, COOPER B-LINE, ERICO, HILTI, POWER FASTENERS.

SUPPORT CHANNELS SHALL BE PAINTED STEEL. PROVIDE GALVANIZED STEEL FOR WET/DAMP LOCATIONS. ALL HARDWARE TO BE CORROSION RESISTANT.

ANCHORS AND STRUCTURAL COMPONENTS

SUPPORTS SHALL HAVE STRUCTURAL SAFETY FACTOR STRENGTH OF TWICE THE MAXIMUM SEISMIC FORCES TO WHICH THEY WILL BE SUBJECTED. THROUGH BOLTS SHALL COMPLY WITH ASTM A 325. WELDING LUGS SHALL COMPLY WITH MSS-SP-69, TYPE 57.

BEAM CLAMPS FOR STRUCTURAL STEEL SHALL BE DOUBLE SIDED.

FASTEN CONCRETE ANCHORS PER THE REQUIREMENTS OF APPENDIX D OF ACI 318-11.

FASTEN MASONRY ANCHORS WITH EXPANSION ANCHORS OR SELF-TAPPING MASONRY SCREWS.

DO NOT EXCEED 25 LBS. PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING.

26 05 33 CONDUIT AND BOXES

CONDUIT

ACCEPTABLE CONDUIT MANUFACTURERS: ALLIED, LTV, STEELDUCT, WHEATLAND TUBE CO, O-Z GEDNEY.

ACCEPTABLE FITTINGS MANUFACTURERS: APPLETON ELECTRIC, O-Z GEDNEY, ELECTROLINE, RACO, BRIDGEPORT, MIDWEST, REGAL, THOMAS & BETTS, CROUSE-HINDS, KILLARK

ELECTRICAL METALLIC TUBING (EMT), MINIMUM 3/4" SHALL BE USED IN FINISHED SPACES FOR ALL BRANCH CIRCUITS.

RIGID METALLIC CONDUIT (RMC) SHALL BE USED IN WET OR DAMP LOCATIONS.

FLEXIBLE METALLIC CONDUIT (FMC) SHALL BE USED FOR CONNECTIONS TO MOTORS AND LIGHT FIXTURES.

EMT CONDUIT FITTINGS SHALL BE STEEL SET-SCREW TYPE.

CONDUIT AND CONDUCTOR SIZING SHALL BE COORDINATED TO LIMIT CONDUCTOR FILL TO LESS THAN 40%, MAINTAIN CONDUCTOR AMPERE CAPACITY AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

CONDUIT SHALL NOT CONTAIN MORE FOUR (4) QUARTER BENDS (360°) BETWEEN PULL BOX POINTS.

ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS. WHERE CONDUIT PENETRATES FIREWALLS AND FLOORS, SEAL WITH A UL LISTED SEALANT. SEAL INTERIOR OF CONDUIT AT EXTERIOR ENTRIES.

EXPOSED CONDUIT ON EXTERIOR WALLS OR ABOVE ROOF WILL NOT BE ALLOWED.

BOXES

OUTLET BOXES FOR LUMINAIRES TO BE MINIMUM 1-1/2" DEEP.

LIGHT CONTROL SWITCHES, DIMMERS AND OCCUPANCY SENSOR BOXES SHALL BE 4 INCHES SQUARE BY 2-1/8 INCHES DEEP.

MULTIPLE GANG SWITCH OUTLETS SHALL CONSIST OF THE REQUIRED NUMBER OF GANG BOXES APPROPRIATE TO THE QUANTITY OF SWITCHES COMPRISING THE GANG. PROVIDE PLASTER RINGS AND COVERS AS NEEDED.

RECEPTACLE OUTLET BOXES SHALL BE 4 INCHES SQUARE WITH RAISED COVER TO FIT FLUSH WITH FINISHED WALL LINE.

GALVANIZED STEEL BOXES MAY BE USED IN CONCEALED OR EXPOSED INTERIOR LOCATIONS, ABOVE CEILINGS, AND MIN. RECESSED STUDDED PARTITIONS.

CAST BOXES SHALL BE USED IN EXTERIOR LOCATIONS, HAZARDOUS LOCATIONS, WET LOCATIONS, CONCRETE SLAB ON GRADE.

[ECONN]: ELECTRICAL CONNECTION TO EQUIPMENT AND MOTORS, SIZED PER NEC.

26 05 53 ELECTRICAL IDENTIFICATION

COLORED ADHESIVE MARKING TAPE FOR BANDING RACEWAYS, WIRES, AND CABLES: 3 MILS THICK BY 2" WIDTH.

PRETENSIONED FLEXIBLE WRAPAROUND COLORED PLASTIC SLEEVES FOR CABLE IDENTIFICATION.

WIRE/CABLE DESIGNATION TAPE MARKERS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND, WITH PREPRINTED NUMBERS AND LETTER.

CABLE TIES: NYLON, 0.18" WIDTH, 50-LB MINIMUM TENSILE STRENGTH.

ALUMINUM, WRAPAROUND MARKER BANDS: 1" WIDTH, 0.014 INCH THICK ALUMINUM BANDS WITH STAMPED OR EMBOSSED LEGEND, AND FITTED WITH SLOTS OR EARS FOR PERMANENTLY SECURING AROUND WIRE OR CABLE JACKET OR AROUND GROUPS OF CONDUCTORS.

ENGRAVED, PLASTIC-LAMINATED LABELS, SIGNS AND INSTRUCTION PLATES: BLACK LETTERS ON WHITE FACE FOR NORMAL POWER.

SAFETY SIGNS: COMPLY WITH 29 CFR, CHAPTER XVII, PART 1910.145.

JUNCTION, PULL AND CONNECTION BOXES: 3/8-INCH KROY TAPE.

COVER PLATES FOR RECEPTACLES: INDICATE SOURCE AND CIRCUIT NUMBER SERVING THE DEVICE: 3/8-INCH KROY TAPE OR BROTHER SELF-LAMINATING VINYL LABEL WITH BLACK LETTERS.

26 27 26 WIRING DEVICES

ALL SWITCH, RECEPTACLE, OUTLET, AND COVERPLATE COLORS SHALL BE WHITE, VERIFIED WITH ARCHITECT, UNLESS INDICATED OTHERWISE.

ALL SWITCHES, RECEPTACLES, AND OUTLET FACEPLATES SHALL BE COMPLETE WITH UNBREAKABLE THERMOPLASTIC COVERPLATES IN FINISHED SPACES WHERE WALLS ARE FINISHED. PROVIDE #302 STAINLESS STEEL COVERPLATES IN UNFINISHED SPACES FOR FLUSH BOXES.

INSTALL RECEPTACLES VERTICALLY WITH GROUND SLOT UP.

TEST RECEPTACLES FOR PROPER POLARITY, GROUND CONTINUITY, AND COMPLIANCE WITH REQUIREMENTS.

RECEPTACLES

[REC-DUP]: NEMA 5-20R DUPLEX RECEPTACLE: HUBBELL 5352A, LEVITON, 5362-S, PASS & SEYMOUR 5362, COOPER 5352.

[REC-DUP-GFI]: NEMA 5-20R GROUND FAULT DUPLEX RECEPTACLE: HUBBELL GF20L, LEVITON GFNT2, PASS & SEYMOUR 2097, COOPER SGF20.

[REC-SIM-1430R]: NEMA 14-30R SIMPLEX RECEPTACLE: HUBBELL HBL9430A, LEVITON 278, PASS & SEYMOUR 3864, COOPER 5744N.

26 28 16 DISCONNECT SWITCHES

ACCEPTABLE MANUFACTURERS: SQUARE D 3110 SERIES, EATON DH SERIES, ABB TH SERIES, SIEMENS HNF / HF SERIES

[DS-#]: NON-FUSIBLE SWITCH ASSEMBLIES, HEAVY DUTY TYPE, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH, HANDLE LOCKABLE IN OFF POSITION.

SECTION 26 09 33 LIGHTING CONTROL SYSTEMS

SYSTEM DESCRIPTION

PERFORMANCE STATEMENT: THE SPECIFICATION SECTION AND LIGHTING DESIGN DOCUMENTS DESCRIBE THE MINIMUM MATERIAL QUALITY, REQUIRED FEATURES, AND OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM. THE DOCUMENTS DO NOT CONVEY EVERY COMPONENT, RELAY, WIRE, AND EQUIPMENT CONNECTION REQUIRED. THE CONTRACTOR AND LIGHTING CONTROL MANUFACTURER/VENDOR ARE SOLELY RESPONSIBLE FOR DETERMINING ALL SYSTEM COMPONENTS, WIRING, AND PROGRAMMING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM BASED ON THE PERFORMANCE BASED REQUIREMENTS OF THE DOCUMENTS.

LIGHTING SEQUENCE OF OPERATION (SOO): THE SEQUENCE OF OPERATION (SOO) DESCRIBES THE REQUIRED LIGHTING CONTROL OPERATION AND PERFORMANCE IN EACH SPACE.

DRAWINGS: THE DRAWINGS INCLUDE THE SEQUENCE OF OPERATION (SOO), LUMINAIRE SCHEDULE, LOCATION OF CONTROL DEVICES, SENSORS, AND IDENTIFICATION OF CONTROL ZONES, AND BRANCH POWER CIRCUITING. CONTROL WIRING AND MANUFACTURER/VENDOR SPECIFIC COMPONENTS ARE NOT SHOWN, BUT SHALL BE SUBMITTED WITH THE SHOP DRAWING SUBMITTALS.

LIGHTING CONTROL OVERVIEW

LIGHTING CONTROL SYSTEM: AS DEFINED IN THE SYSTEM DESCRIPTION, THE DESIGN DOCUMENTS DESCRIBE THE OPERATIONAL PERFORMANCE REQUIREMENTS OF THE LIGHTING CONTROL SYSTEM.

ALL SYSTEM COMPONENTS AND MATERIALS OF SIMILAR FUNCTION (E.G., SWITCHES, DIMMERS, SENSORS, CONTACTORS, RELAYS, ETC.) SHALL BE OF THE SAME MANUFACTURER, UNLESS SPECIFICALLY STATED OTHERWISE ON DRAWINGS OR ELSEWHERE IN THE SPECIFICATIONS. LIGHTING CONTROL SWITCHES, SYSTEMS, AND COMPONENTS SHALL BE LISTED.

DEVICE COLOR AND COVERPLATES

ALL SWITCHES AND LIGHTING CONTROLS SHALL BE COMPLETE WITH COVERPLATES THAT MATCH MATERIAL AND COLOR OF THE WIRING DEVICE COVERPLATES IN THE SPACE. WHEN THE COVERPLATE IS PROPRIETARY TO THE DEVICE MANUFACTURER AND DO NOT MATCH THE WIRING DEVICE COVERPLATES, THE ARCHITECT SHALL SELECT THE COVERPLATE COLOR AND MATERIALS FROM THE STANDARD COVERPLATE OPTIONS.

WHERE SEVERAL DEVICES ARE GANGED TOGETHER, THE COVERPLATE SHALL BE OF THE GANGED STYLE FOR THE NUMBER OF DEVICES USED.

STANDALONE LINE AND LOW VOLTAGE LIGHTING CONTROLS

OVERVIEW: WALL SWITCHES AND WALL DIMMERS: UL LISTED WITH INTEGRAL AIR-GAP SWITCH FOR ON/OFF CONTROL, INTEGRAL EMI/RFI SUPPRESSION, NON-VIEWABLE HEAT SINK, DIMMER TO MATCH DEVICE COLOR, DIMMER COMPATIBILITY AND WIRING WITH THE LOAD BEING CONTROLLED SHALL BE VERIFIED BY CONTRACTOR PRIOR TO PURCHASE AND INSTALLATION.

SW-O: DUAL TECHNOLOGY OCCUPANCY SENSOR WITH WALL SWITCH (STANDALONE): WALL SWITCH WITH MANUAL ON/AUTO/OFF. 120/277 VAC LOAD RATING OF 0-800 W FOR LED. 5-, 15-, 20-MINUTE ADJUSTABLE OFF DELAY. DUAL TECHNOLOGY ULTRASONIC AND PIR COVERAGE OF MINOR MOTION IN 12' X 15' PATTERN AND OCCUPANCY DETECTION IN AREA BASED ON HALF-STEP WALKING MOTION. SENSITIVITY ADJUSTMENTS SEPARATE FOR EACH SENSING TECHNOLOGY. MANUFACTURERS: WATT STOPPER DW-100 SERIES, HUBBELL LHMTS, LEVITON OSSMT SERIES, SENSOR SWITCH WSX-PDT SA SERIES.

SW-OC-#: OCCUPANCY / VACANCY SENSORS (STANDALONE): COMBINATION DEVICES: SUBSCRIPTS IDENTIFY COMBINATION TYPE DEVICES WHEN APPLICABLE. THE CONTRACTOR SHALL PROVIDE THE COMBINATION DEVICE OR PROVIDE MULTIPLE DEVICE(S) TO MEET THE FUNCTIONALITY WHEN THE MANUFACTURER DOES NOT OFFER THE REQUIRED FUNCTIONALITY WITH A SINGLE DEVICE.

GENERAL DESCRIPTION: WALL- OR CEILING-MOUNTING, SOLID-STATE UNITS WITH A SEPARATE POWER SUPPLY/RELAY UNIT. OPERATION - OCCUPANCY: OCCUPANCY SENSORS TURN LIGHTS 'ON' WHEN COVERED AREA IS OCCUPIED AND TURN LIGHTS 'OFF' WITH A TIME DELAY WHEN UNOCCUPIED, UNLESS OTHERWISE INDICATED. TIME DELAY 'OFF': FIELD ADJUSTABLE WITH A MINIMUM RANGE OF 1-20 MINUTES. SENSOR OUTPUT: CONTACTS RATED TO OPERATE THE CONNECTED RELAY, COMPLYING WITH UL 773A. SENSOR SHALL BE POWERED FROM THE RELAY UNIT. POWER SUPPLY TO SENSOR SHALL BE 24 V DC, 150-MA, CLASS 2 POWER SOURCE AS DEFINED BY ELECTRICAL CODE. MOUNTING: SENSOR: SUITABLE FOR MOUNTING IN ANY POSITION ON A STANDARD OUTLET BOX. RELAY: EXTERNALLY MOUNTED THROUGH A 1/2-INCH KNOCKOUT IN A STANDARD ELECTRICAL ENCLOSURE. MOUNT RELAY ABOVE ACCESSIBLE CEILING NEAR ENTRY DOOR TO ROOM OR AREA. TIME DELAY AND SENSITIVITY ADJUSTMENTS: RECESSED AND CONCEALED. INDICATOR: LED TO SHOW WHEN MOTION IS BEING DETECTED DURING TESTING AND NORMAL OPERATION OF THE SENSOR. BYPASS SWITCH: OVERRIDE THE ON FUNCTION IN CASE OF SENSOR FAILURE. POWER SUPPLY AND CHILD PACKS: PROVIDE AS REQUIRED FOR SENSOR QUANTITY AND SWITCHING SCHEME. MOUNT TO STANDARD 1/2" KNOCKOUT ON ELECTRICAL BOX ABOVE ACCESSIBLE CEILING NEAR ENTRY DOOR TO ROOM OR AREA.

(A): ULTRASONIC TWO-SIDED CORRIDOR COVERAGE OCCUPANCY/VACANCY SENSOR: FREQUENCY GREATER THAN 32 KHZ SOLID STATE. ADJUSTABLE SENSITIVITY AND TIME DELAY, TEMPERATURE AND HUMIDITY RESISTANT RECEIVERS. SENSOR SHALL CONTROL ALL CIRCUITS IN AREA, UNLESS NOTED OTHERWISE. MANUFACTURERS: WATT STOPPER WT-2250 SERIES, HUBBELL OMNI-US OR ATU SERIES, GREENGATE ODC-U SERIES.

INSTALLATION

INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SHOP DRAWINGS.

ALL WIRING SHALL BE INSTALLED IN CONDUIT.

ALL BRANCH LOAD CIRCUITS SHALL BE LIVE TESTED BEFORE CONNECTING THE LOADS TO THE LIGHTING CONTROL PANEL.

26 51 19 LIGHTING

DELIVER PRODUCTS TO SITE. PROTECT LUMINAIRE FINISHES, LENSES, AND TRIMS FROM DAMAGE DURING STORAGE AND INSTALLATION. DO NOT REMOVE PROTECTIVE FILMS UNTIL CONSTRUCTION CLEANUP WITHIN EACH AREA IS COMPLETE.

THE WARRANTY PERIOD BEGINS AT THE DATE OF SUBSTANTIAL COMPLETION. PROVIDE LED LIGHT ENGINES AND DRIVERS WITH A FIVE (5) YEAR WARRANTY.

LIGHT EMITTING DIODES USED IN INTERIOR APPLICATIONS SHALL HAVE A MINIMUM CO